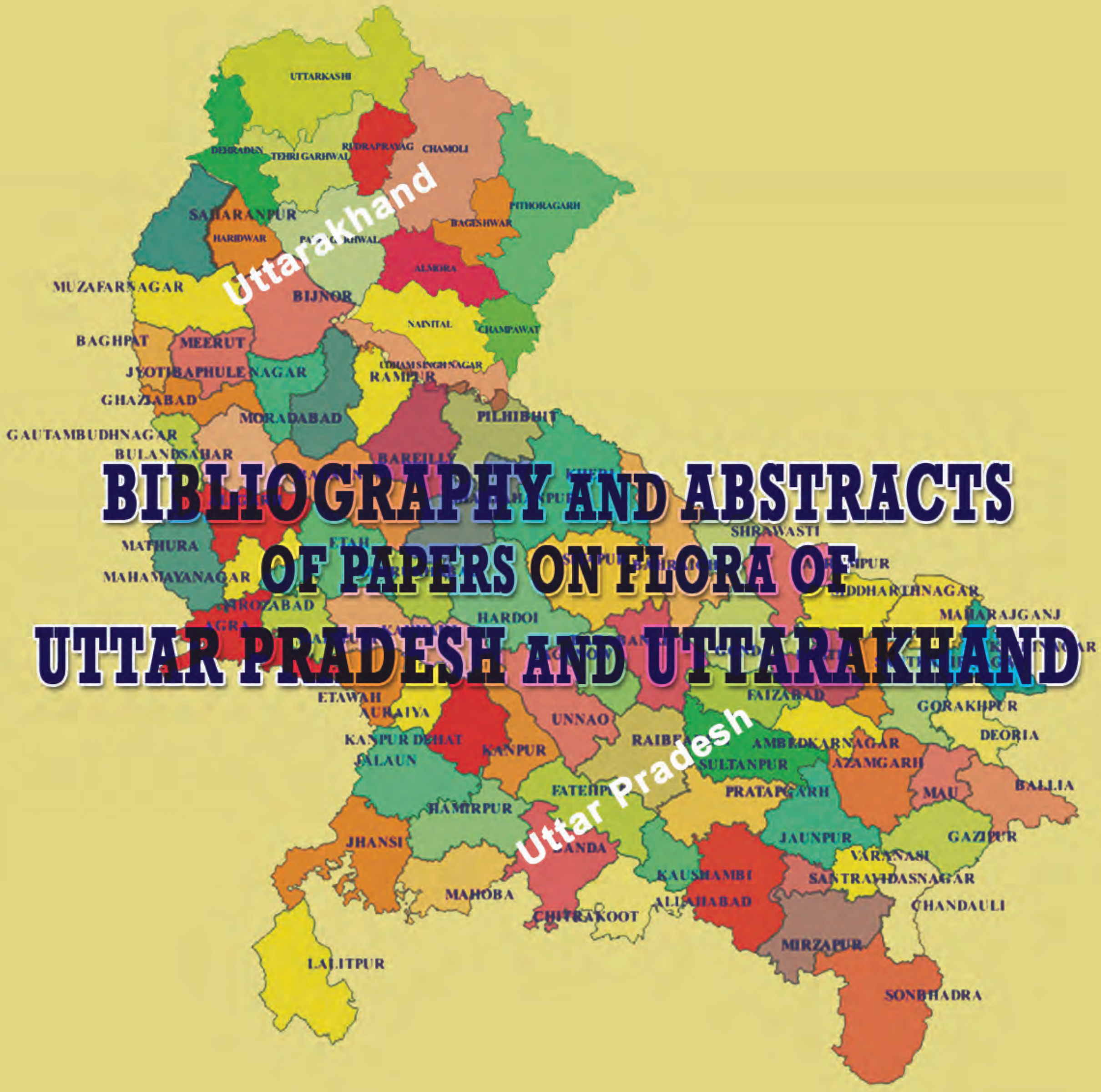

BIBLIOGRAPHY AND ABSTRACTS OF PAPERS ON FLORA OF UTTAR PRADESH AND UTTARAKHAND

Nature Protects if She is Protected

Ministry of Environment, Forest & Climate Change

WORKING TOWARDS A SUSTAINABLE ENVIRONMENT

ENVIS INDIA

भारतीय वनस्पति सर्वेक्षण
BOTANICAL SURVEY OF INDIA

ENVIS Resource Partner on Biodiversity
BOTANICAL SURVEY OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

2021

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FOREWORD

The ENVIS Centre on Floral Diversity of the Botanical Survey of India has been publishing Bibliography and Abstracts of Papers pertaining to Floras of States and Union Territories of India. In this attempt, the Centre has already published consolidated bibliography and abstracts of papers on flora of West Bengal (in two parts), North East India – I, Andaman and Nicobar Islands, Maharashtra, Kerala, Tamil Nadu, Karnataka, Goa, Andhra Pradesh (including Telangana), Odisha, Bihar and Jharkhand, Madhya Pradesh and Chhattisgarh. In continuation to this series of publication, compilation of wide range of papers pertaining to the flora, vegetation, ethnobotany and issues related to traditional knowledge and conservation of plant resources of Uttar Pradesh and Uttarakhand has been compiled by the ENVIS Resource Partner on Biodiversity, BSI.

Uttar Pradesh, the 4th largest state in the country is rich in floristic diversity. Situated in the Indo-Gangetic Plain of north central India, it provides vast stretch of agricultural field with rich agro-biodiversity as well. The topography, climatic condition and geographical position of Uttar Pradesh favour the growth of luxuriant floristic elements in various types of forests. Six major forest types viz., 1. Tropical Sal forest; 2. Tropical deciduous forest; 3. Tropical Teak forest; 4. Tropical seasonal Swamp forest; 5. Ravine thorn forest and 6. Grasslands can be seen in Uttar Pradesh. The state has good cover of Protected Area network with one National Park, 24 Wildlife Sanctuaries and one Ramsar site. It has a very long history of botanical research and legacy of many eminent scientists engaged in floristic studies. It has many premier institutes including Botanical Survey of India, which are constantly documenting the floristic wealth and other aspects of plant science in the state. Botanical Survey of India has taken initiative for publishing the state flora of Uttar Pradesh in three volumes, with the first volume already published. However, there are still large amount of data related to floristic and ethno-botanical research in the state which are available in scattered publications. Based on available data/ publications the floristic diversity of the state can be consolidated as 2817 species belonging to 1200 genera under 176 families of flowering plants which also include 518 cultivated species. This constitutes 15.51 % of the total flowering plants diversity of the country.

Uttarakhand is a small hilly state, carved out from the erstwhile Uttar Pradesh in the year 2000 as Uttaranchal. This state is mostly occupied by the high Himalayan mountain range with very small portion of foot hills, terai and plain area. It has a 71.05% forest cover which itself testify the extremely rich floristic diversity. The state is also home to age old traditional system of medicine where most of the procedures involve various plant species. The tropical to high alpine climate suits wide range of floristic elements. It shares its boundary with China and Nepal and many components of flora of these countries can be seen here. The state has a good protected area cover with the Nanda Devi Biosphere Reserve, six national parks, four wildlife sanctuaries and four conservation reserves. Although, very small in geographical expanse, Uttarakhand harbours over 26 percent of flowering plants of India. The major river systems like Ganges, Yamuna etc. have their origin in Uttarakhand, which are responsible for the economy, climate, agriculture and well-being of most part of the country at the downstream. The state again has witnessed a long history of floristic expeditions and documentation. Almost all the plant based research in the country have some link with Uttarakhand for obtaining their research samples. Thousands of research papers and books are available for the state which contains information on the floristic diversity and their traditional use. Botanical Survey of India has also started publishing the state's flora and also consolidated the plant diversity in a checklist. The current estimate of species diversity in Uttarakhand stands at 5000 taxa (including 200 cultivated ones) of flowering plants representing 1450 genera in 215 families. Two genera and 107 taxa are endemic to the state. Ninety four threatened and conservation target species are also present in this state. It is important to compile the available information on floristic wealth of such a rich state to consolidate the knowledge on plants of this region.

The present work was initiated with an objective to compile the scattered literature to prepare a comprehensive bibliography and abstracts of research articles, floras/books pertaining to the rich and diverse flora of Uttar Pradesh and Uttarakhand states. The present issue of bibliography and abstracts of papers on flora of these two states consists a total of 3159 references, including 1216 on flora, vegetation, forestry and ecology, 428 references on fungi, lichens and algae, and other non-flowering plant groups and gymnosperms, 585 references on new discovery, new reports, rediscovery, revision and monograph, 102 references on endemism, IUCN threat status and conservation, and 828 references on ethnobotany, sacred groves and medicinal plants. An electronic version of this publication will be made available on BSI ENVIS RP website (www.bsienvis.nic.in). This publication would serve as a ready reference for students, researchers, policy makers and amateurs interested to work on floristic diversity of these two states.

Botanical Survey of India
Kolkata

(**A.A. Mao**)
Director

INTRODUCTION

UTTAR PRADESH

Uttar Pradesh is the 4th largest state in India, covering an area of 2,40,928 sq. km (ca 7.3% of total area of the country), is located between 23°52'–30°28' N latitudes and 77°05'–84°38' E longitudes in the Indo-Gangetic Plain of north central India. It is a landlocked state bounded by Nepal and Uttarakhand in the north; Delhi, Haryana and Rajasthan in the west; Madhya Pradesh and Chhattisgarh in the south; and Bihar and Jharkhand in the east. Administratively, the state has been divided in to 17 divisions, which have been further divided into 75 districts, with Lucknow as the capital city. The geographical position, climate and physiography of the state favour high amount of biological diversity. It is bestowed with wide range of floristic elements including many therapeutically and economically valuable plant species. Majority of its area belongs to the Gangetic plains, which support agriculture based economy, dense human settlements and rich cultural diversity. It is important to document the floristic wealth of such a large geographical land and one of the diverse agro-economic zone for the optimum utilizitation of this natural resources. Several institutes, universities, departments and amaeturs are engaged in documenting the floristic diversity of the state. Botanical Survey of India has also taken initiatives in publishing the State Flora of Uttar Pradesh in three volumes. The present work is aimed at compiling the bibliographic references available which are pertaining to the floristic documentation of Uttar Pradesh. The introductory chapter highlights the physiography, climate, topography, forest types and floristic composition of the state for a ready reference.

PHYSIOGRAPHY: Physiographically, Uttar Pradesh can be divided into three distinct regions namely, the Terai region in the north which is also known as sub Himalayan zone, the Gangetic Plain in the middle and the Peninsular region in the south. The Gangetic plain covers the maximum extent with about 1,49,000 sq. km area. It is a topographic trough, the longitudinal axis of which runs along the mighty Ganga River, and forms the southern boundary of the Himalayan mountain ranges and the northern limit of the Peninsular Uplands. The average elevation of the plain is about 150 m above mean sea level and adjacent to foothills it is little above 300 m. The Peninsular Upland covering 25,280 sq. km, presents a landscape of detached hills, flat topped ridges, summit plains and entrenched narrow to broad valleys. In the western part of the state, adjacent to the states of Haryana, Delhi and Rajasthan, a number of disconnected hills mark the boundary of the alluvial plain. To the east, the east-west trending Vindhyan Range limits the southern extension of the Ganga Plain, while in the western part the Upland in the form of a pediplain merges with the Ganga Plain.

GEOLOGY: Uttar Pradesh is home to diverse geological set ups. The physiographic features are directly related to the geology, which can be distinctly visible in two provinces – the larger Indo-Gangetic Plain and the smaller southern peninsular upland region. The Indo-Gangetic Plain or Ganga Plain is the largest alluvial plain in the world extending to the states of Uttar Pradesh, Bihar and West Bengal and of highly productive in nature. The Peninsular Upland region at southern part of Uttar Pradesh is the beginning of large Peninsular India, and is characterized by plateus and uplands comprising of Archaean to early Proterozoic rocks.

SOIL: Uttar Pradesh has one of the biggest fertile alluvial plains of the world and characterized by fine texture. The nature of soil varies in different regions with sandy loam to fine textured alluvium to black and red soil metamorphosed from the rocks. They have variable fertility, therefore different species composition and agricultural practices. The fine alluvial soil of Gangetic plain does not support tree growth, except near the slopes. Shorea robusta (Sal) is the dominant tree in these slopes. Otherwise, this area support growth of grasses during dry season also and is important as grazing ground. The soil in terai and central region is dark grey, acidic in nature and vary from loamy to sandy loam. In the eastern region, soil is of three kinds – Bhat, Banjar and Dhuh. They have gigh lime content and found in relatively dry area. The soil in western Uttar Pradesh at Bundelkhand-Vindhyan hills is sandy with poor fertility. They have usually evolved through degradation of the Vindhyan hilly tracts, partly by the rivers flowing through it. The black soil known as 'Mer' and 'Kabar' are calcareous and clayey with high degree of fertility.

CLIMATE: Uttar Pradesh has a tropical monsoon climate which is characterized by a warm wet season from the end of June to the end of September, followed by a dry season for the rest of the year. The winter is considered as dry, dusty and severely cold which extends from Middle of October to end of February. Summer is harse with dry, hot wind (Loo) and high temperature during April to June. Quantity of monsoon rain varies in different parts of the state, the eastern part receiving relatively more rain than the western part. The average annual rainfall and mean temperature vary between 1000–1200 mm and 22.5°C–25°C respectively. The climatic condition support tropical dry deciduous forest and also some xerophytic elements, with large stretch of agricultural field and grasslands.

WATER RESOURCES: The rivers are main source of prosperity in Uttar Pradesh. The Ganga and Jamuna are the major rivers of the state which originate in Uttarakhand from Gangotri and Yamunotri glaciers respectively. Actually, Ganga is formed by the 7 different streams. Alakhnanda and Mandakini both major streams merge at Rudra Prayag that in turn confluence with Bhagirathi at Dev Prayag to form Ganga. The other streams or rivulets such as Pindar, Dhauli also join the Ganga on the right bank. Afterwards, Ganga flows to Haridwar, Garh Mukteshwar, industrial city of Kanpur and moves to Allahabad where it meets Yamuna. The confluence of Ganga, Yamuna and invisible under ground Saraswati is famous for the Kumbh fair (Mela) that takes place every 12 years. Then Ganga moves to Varanasi and enters in the state of Bihar near Dehri-on-Sone. Finally, it merges with sea in the Bay of Bengal at Ganga Sagar located in the state of West Bengal. Another major river Yamuna flows through Uttarakhand, Delhi, Haryana and Uttar Pradesh, before merging with Ganga at Allahabad. Hindan, Chambal, Betwa and Ken are important tributaries of this river. Sharda is another important river which originates from Mansarovar lake in Tibet (China), passes through Nepal as Kalinadi. It joins tributaries and finally takes name Sharda near Pilibhit. Sharda meets Ghaghra near Barabanki and moves further to Faizabad where it is also known as Saryu. Out of total catchment area (1,27,950 sq. km) of this river, 45% fall in Uttar Pradesh. Rapti and Little Gandak are its major tributaries. River Gomti originating from Pilibhit drains the area between Ramganga and Sharda in the upper reaches and Ganga and Ghagra at lower reaches. Ramganga, a tributary of Ganga drains South-Western Kumaun Himalayas. It travels through the valleys of Almora and Nainital and enters in the Tarai region. Apart from this, other rivers like Jarnni and Dhasan in Lalitpur district, Sone in Sonebhadra district, Bisuhi and Manwar in Gonda district, Gambhir in Mainpuri districts, Kuwana in Bahraich district, Rawal in Sant Kabir Nagar district and Terhi in Bahraich district flow in the state and help in irrigation. The sources of most of the irrigation projects are Ganga and Sharda/Ghagra rivers. Small dams are also constructed on these rivers in Tarai and Bundelkhand areas. The rivers originating in Himalayas are full of water throughout the year due to melting of snow and higher rain fall as compared to Vindhyan hills, while Vindhyan rivers dry up in the summers.

MINERAL RESOURCES: The state is poor in mineral resources. The only considerable deposits of limestones are found in Mirzapur and Sonbhadra districts. These are being quarried and used largely in cement manufacture. Dolomite occurs in small quantities in Banda, Mirzapur, Sonbhadra and Varanasi districts; alunite in Mirzapur district; pyrophyllite and diaspore in Jhansi and Hamirpur districts; bauxite in Karvi tehsil of Chitrakoot district and in southern part of Varanasi district and a coalfield located in Singrauli area of Sonbhadra district.

AGRICULTURE: Economy in Uttar Pradesh is Agriculture based and majority of the population depend on farming as their main occupation. The share of agriculture in the total income of the state is about 33%. Wheat, rice, sugarcane, pulses, oil seeds and potatoes are the main agricultural produce of the state. Sugarcane is an important cash crop and sugar mills and other cane crushers which produce 'gur and khandsari' are common throughout the state. Uttar Pradesh contributes 48% to the country's total sugar cane production and is also the largest producer of sugar in the country. Potato is another important crop and 42-45 % potato production in the country is shared by the U .P. The state is the second largest producer of vegetables in the country after West Bengal. Uttar Pradesh is equally important horticulture perspective. The state is known for best varieties of Mango, Guava, Aegle marmelos (Bael), Banana etc. The silk produced in Uttar Pradesh is unique and under high demand.

FOREST TYPES AND VEGETATION: The topography and climate of Uttar Pradesh support the existance of diverse vegetation/forest type in the state. Based on Champion and Seth (1968), and further survey work carried out by Botanical Survey of India along with other published literature, the forest of Uttar Pradesh can be broadly classified into following six types. They are further classified in to more smaller categories based on the species composition and geographical position.

1. Tropical Sal forest: Based on climate, topography and edaphic conditions, the 'Sal' forests of the state are categorized into following types.

(a) Moist Sal forest: These 'Sals' are present in northern part of Terai region where rain fall is not less than 1,000 mm and get fairly mature soil with adequate moisture for good growth. These forests are again subdivided into two sub types. (i) Moist Siwalik Sal forest: These occur at 300 m altitude on Nahan sandstone with light soil in Siwalik zone near Saharanpur in western part of the state, (ii) Moist Damar Sal forest: These 'Sals' are developed on high alluvial terraces with good loamy soil lacking pebbles and found in North-Kheri division of the state. These are also known as Damar (high river bank) 'Sals'. The best quality of 'Sal' forests in natural condition is found in North-Kheri area.

(b) Moist plain Sal forest: These 'Sal' forests are again divided into two subtypes depending upon the soil conditions, (i) Western light alluvium plain Sal forest: These generally occur on sandy alluvium with dry subsoil in western part of North and South Kheri and Pilibhit ranges, frequently growing on lower levels in the Damar type and drier elevated portions of the Terai type, (ii) Eastern heavy alluvium plain Sal forest: These 'Sal' forest are characteristic of the lower reaches and occur on yellow clayey alluvium with low undergrowth of shrubs and little or no grasses. These are found in upper plains in Gorakhpur, Bahraich, Gonda, Balrampur districts and continue up to Assam.

(c) Dry Sal forest: 'Sal' of these forests are of low quality but more mixed with other species than in the moist deciduous forests and occur in pure groups or mixed patches of varying extent with predominance of its associates. These forests are poor in growth, below 18 m high with badly shaped boles and irregular canopy. The annual rain fall may be low as less as 900 mm with long dry season. These are divided into two subtypes, (i) Dry Siwalik Sal forest: In these forests soil is derived from siwalik sand rock, which is shallow sandy and drained completely. These Sal forests are found in Siwalik ranges in Saharanpur districts. (ii) Dry plain Sal forest: This type of Sal forest is found in Bahraich district. Besides Terai areas, the sal forests are also found in Chandauli, Mirzapur, Sonbhadra districts of Vindhyan highlands. These forests are also poor in growth but possess *Hardwikia binata* as a characteristic species which is absent in other above mentioned categories of sal forests of the state.

2. Tropical deciduous forest: It is divided into:

(a) Moist mixed deciduous forest: These forests are characterized by their large number of species, the composition vary from place to place depending on the local factors like the topography, type of soil, availability of sunlight, rain and temperature. These forests occur comparatively at higher altitudes in moist Terai region (Pilibhit, Kheri, Bahraich, Gonda, Shravasti, Balrampur, Siddharthnagar, Gorakhpur, etc. districts) of the state and have open top canopy of scattered mixed deciduous species of uneven size. A combination of deciduous and evergreen smaller trees and shrubs form the second storey. The species of lianas, climbers and ferns add to the beauty and density of these forests. Two minor categories are also recognized under this forest type: (i) *Terminalia alata* forest: This moist deciduous type is distributed throughout the sal forests on heavy or wet soil in small patches in Tarai region especially in Katraniaghat Wildlife Sanctuary in Bahraich district and along the Rohini River in Gorakhpur district and (ii) Alluvial forest: These forests are usually found on the newly deposited sandy alluvium along the banks of rivers and encountered in Gandak and Kalanahi reserves along the banks of river Great Gandak. These forests are liable to be frequently flooded and submerged.

(b) Dry mixed deciduous forest: These forests are found on gentle hilly slopes in Saharanpur Siwalik and Bundelkhand - Vindhyan regions (Lalitpur, Jhansi, Banda, Mahoba, Chitrakoot, Mirzapur and Sonbhadra districts) as well as on flat terrains of the state due to formation of some good soil and good water holding capacity. In these forests sunlight reaches to the ground that helps the shrubs and other herbaceous vegetation to grow luxuriantly. These forests are subjected to anthropogenic pressure for expansion of agricultural land and developmental activities. Dry scrub and thorn forests are also characteristics of this forest type, which can be further categorized in to – *Anogeissus pendula* forest; *Aegle* forest; Babul savannah forest; and Khair-Sissoo forest.

3. Tropical Teak forest: These forests are found both in moist and dry situations. These are of two types.

(i) Moist Teak forest: These deciduous forests occur on higher and more stable alluvial terraces in patches (usually plantations raised by forest department) in Gorakhpur district of Terai eco region. Teak *(Tectona grandis)* has become naturalized and mixed in these forests.

(ii) Dry Teak forest: These deciduous forests are confined in small patches on well drained loam or sand loam (quartzite and gneiss) along the river banks, plains and hill terraces between the hills in Jhansi and Lalitpur districts.

4. Tropical seasonal swamp forest: Swamp forests develop in low lying areas due to stagnation of water. The area remains under water for a quite long period during rains and sometimes for many months. The species composition varies with the degree of water logging. These forests are chiefly located along the river Pyas, Mala, Tura and Ritahia nullah in Gorakhpur and Suheli and Kathana river sides in Kheri Lakhimpur districts where it belongs to either *Barringtonia* swamp forest or *Syzygium cumini* swamp forest. The latter type is found usually in drier areas as compared to former. At some places these forests get mixed together with low swamp forests having bushy formation in compact groups of *Cephalanthus tetrandra* which occur in gangetic valley from Pilibhit eastwards. The characteristic species found in these swamp forests are *Haldina cordifolia, Ficus racemosa, Ficus hispida, Ficus semicordata, Barringtonia acutangula, Bombax ceiba, Callicarpa macrophylla, Bischofia javanica, Syzygium cumini, Grewia eriocarpa, Glochidion multiloculare, Mallotus nudiflorus, Terminalia arjuna, Trema orientalis, Putranjiva roxburghii, Grewia serrulata, Tamarix dioica,* etc. Along the edges of water, trees like *Barringtonia acutangula* and *Salix tetrasperma* and shrubs like *Ardisia solanacea, Ficus heterophylla, Eranthemum pulchellum, Hyptianthera stricta,* occur. The herbaceous vegetation comprises *Centella asiatica, Bacopa monnieri,* and species of *Polygonum* etc. However, Champion and Seth (1968) has dealt *Barringtonia* swamp forest, *Syzygium cumini* swamp forest, Eastern seasonal swamp low forest *(Cephalanthus)* and Cane-brakes as distinct types.

5. Ravine thorn forest: This type of vegetation occurs in semi arid areas in Mathura, Agra, Etawah and Bundelkhand region where annual rainfall is between 500 and 1000 mm. These are represented by *Alhagi maurorum, Crotalaria burhia, Pedalium murex, Pulicaria angustifolia, Tribulus terrestris, Withania somnifera,* etc. Genera *Acacia* and *Calotropis* are wide spread. In rugged barren river banks, species like *Capparis decidua, Capparis zeylanica,* and *Butea monosperma* are found. Common tree species like *Acacia nilotica* subsp. *indica, Ziziphus mauritiana* are seen at flat river bank areas. Similarly, hilly tracks or hillocks are found in some places of Agra and Mathura districts comprising of denuded rocks and only little soil is available in crevices to support the vegetation. The tree species found in these hillocks are *Flacourtia indica, Helicteres isora, Anogeissus pendula, Wrightia tinctoria,* etc. Species like *Acacia nilotica* subsp. *indica, Butea monosperma, Grewia tenax,* etc. are found at bases of the hillocks.

6. Grasslands: Grasslands are found in the plains, forest clearing areas throughout Gangetic Plains, Vindhyan region and moist Sal Savannah in Terai region. Although Bundelkhand has no pasture land but non-cultivated land, wastelands along railway tracks and banks of irrigation canals, road and river sides, banks of dam and ravines of Yamuna, Betwa and Ken are used as grazing lands. The common species of grassland in plains are *Alloteropsis cimicina, Apluda mutica, Aristida adscensionis, Aristida depressa, Bothriochloa pertusa, Brachiaria ramosa, Cenchrus ciliaris, Enteropogon dolichostachyus, Chrysopogon fulvus, Cynodon dactylon, Dichanthium annulatum, Digitaria* spp., *Echinochloa* spp., *Eragrostis* spp., *Iseilema hackelii, Panicum* spp., *Saccharum spontaneum,* etc.

PLANT DIVERSITY: A number of institutions including Botanical Survey of India have been working on documenting the floristic diversity in Uttar Pradesh. These information are available in a scattered way in various journals and other documents. Srivastava (2004, 2011) presented floristic analysis for entire Uttar Pradesh and reported 2711 species of flowering plants belonging to 1088 genera and 185 families. This was the only compiled status of species, genera and families known so far, from present political boundaries of the state. Presently, with augmentation of survey work and accumulation of more data, the floristic diversity of Uttar Pradesh can be estimated as 2817 species, under 1200 genera and 176 families. Of these, 518 species belong to cultivated category. Uttar Pradesh is one of the rich state with over 15% of flowering plants in India. The dicots are dominant over monocots in the state flora and represented by 2110 species distributed under 938 genera and 140 families, whereas monocots are known by 707 species belonging to 262 genera and 36 families. The ratio of monocots to dicots species is 1: 2.98 whereas the ratio of monocots to dicots genera is 1: 3.58. The 10 dominant families in Uttar Pradesh are Fabaceae (327 spp.), Poaceae (293 spp.), Asteraceae (169 spp.), Cyperaceae (113 spp.), Acanthaceae (105 spp.), Euphorbiaceae (99 spp.), Scrophulariaceae (67 spp.), Convolvulaceae (59 spp.), Malvaceae (57 spp.) and Lamiaceae (53 spp.).

ENDEMIC, RARE AND THREATENED PLANTS: The endemism in Uttar Pradesh flora is very poor. This may be because of the landlocked status of the state, sharing its boundary with other states and also Nepal with similar habitat condition and forest types. Although Khanna (2001) had enumerated 10 taxa of flowering plants as endemic to present Uttar Pradesh flora, but many of these have wide distribution outside the state. K.P. Singh & al. (2016) have listed only six species as endemic to Uttar Pradesh viz. *Alectra parasitica* A. Rich. subsp. *chitrakutensis* (M.A. Rau) K.K. Khanna & An. Kumar (Scrophulariaceae); *Brachystelma pauciflorum* Duthie (Asclepiadaceae); *Cymbopogon osmastonii* Parker (Poaceae); *Hemarthria hamiltoniana* Steud. (Poaceae); *Derris kanjilalii* Sahni & H.B. Naithani (Fabaceae); and *Derris scandens* (Roxb.) Benth. var. *saharanpurensis* (Thoth.) Thoth. (Fabaceae). 53 species in the flora of Uttar Pradesh have been listed by K.P. Singh & al. (2016) as rare and threatened in the wild due to various biotic and abiotic factors. These species together with endemic ones need to be paid attention for their multiplication, conservation and sustainable utilization.

FOREST RESOURCES: Since time immemorial man has always depended on plants and plant products for his essential requirements of food, shelter, fuel and clothing. Even today in modern age man can not survive without plants. There are numerous plant species in Uttar Pradesh which are used by the people in rural areas for their various requirements. Some of the important groups of wild as well as cultivated plants are wild edible plants, medicinal and aromatic plants, oil yielding plants, dye yielding plants, timber yielding plants, fodder plants, wild ornamental plants, plants of religious belief and plants of botanical curiosities. Uttar Pradesh harbours a large number of medicinal and ethnobotanical plants. The tribal communities like Agaria, Baigas, Bhoxas, Gharias, Gonds, Kharwars, Kol, Korwas, Oraon, Panikas, Tharus, etc. residing in the forest areas and villages of Kheri, Sonbhadra, Allahabad, Varanasi, Banda, Jhansi, Lalitpur, Gonda, Bahraich and Gorakhpur districts of the state use several plant species and plant products in different ways in curing their various ailments. Besides, rural folk also utilize plants in several ways for health care. K.P. Singh & al. (2016) listed 702 species of plants occurring Uttar Pradesh those are used in various ways, thereby indicating the significance of the flora.

TRIBAL POPULATION: Tribal population predominantly live in rural areas with maximum concentration in Kheri district. The major tribes of the state are Agaria, Baiga, Bhoxa, Ghasia, Gond, Korwa, Oraon, Panika, Kharwar, Kol, Sahariya, Tharus, Bhotia, Jaunsari and Raji. Tharu is most populous tribe. It is followed by Bhoxa, Bhotia, Jaunsari and Raji. Tharus are concentrated in Kheri, Balrampur and Bahraich districts. Buksa are found in Bijnor and Farrukhabad districts. The remaining 3 tribes - Bhotia, Jaunsari and Raji have maximum population in Agra, Kheri and Gorakhpur districts respectively. Among these five tribes, Buksa and Raji have been recognized as primitive tribes.

PROTECTED AREAS: Uttar Pradesh has one National Park, 24 Wildlife Sanctuaries and one Ramsar site. The floristic diversity of solitary Dudhwa National Park (490 sq. km) situated in Kheri-Lakhimpur district was studied by K.K. Singh (1997). Similarly, some of the wildlife sanctuaries are also studied for floristic documentation. The actual forest cover at present is 14,349 sq. km which is ca 5.96% of the geographical area of the state (Anon., 2013). Of this, 1,623 sq. km are Very Dense Forests (VDF); 4,550 sq. km Moderately Dense Forests (MDF); 8,176 sq. km Open Forests (OF); and 806 sq. km Scrubs. Similarly, tree cover in the state is 6,895 sq. km which is 2.86% of its geographical area. Thus, a total 8.82% of the state geographical area is under forest and tree cover which is much lower than the standard level of 33.33% prescribed in the National Forest Policy, 1988.

BOTANICAL HISTORY: The floristic diversity of Uttar Pradesh has been studied from time to time by several workers. These include scientists from Botanical Survey of India, other research organizations, Universities and Colleges. Apart from the two comprehensive treaties, *Flora of British India* (Hooker, 1872-1897) and *Flora of Upper Gangetic Plain* (Duthie, 1903-1929), a number of other publications in the form of regional or district floras, forest floras, weeds, exotic floras, new distributional records, systematic enumeration of areas, checklists, additions to Duthie's flora, new species, aquatic and marshy species, etc. have been made from various parts of the state. Some of the pioneer floristic works on this region include those of Munro (1844) on the plants of Agra district which is probably the first flora from the state; Edgeworth (1852, 1867) on the plants from the Banda district of Bundelkhand region; Anderson (1859) on the flora of Lucknow including cultivated and indigenous plants; and Parker (1929) on the Sedges of Uttar Pradesh. Similarly, Indian workers include B.L. Gupta (1928) on the flora of Saharanpur division along with other areas; Kanjilal (1933) on the Forest Flora for the Pilibhit, Oudh, Gorakhpur and Bundelkhand; again Kanjilal (1966) on the forest Flora for the plains of Uttar Pradesh; and Raizada (1935, 1936, 1950, 1954, 1958) on the additions to the flora of Duthie with emphasis on grasses. Further, Raizada & al. (1957), Raizada and Jain (1964, 1966) have published an account of grasses from undivided Uttar Pradesh. This enabled Raizada (1976) to publish a supplement to the Duthie's flora of Upper Gangetic Plain. Rau (1969) also prepared a checklist of the flora of Upper Gangetic Plain and other neighbouring areas. The taxonomic account of grasses (B.K. Shukla and Sinha, 2004); families Cyperaceae (Verma & al., 1989); Asteraceae (Narain and Kanchanlata, 2004); Fabaceae (Narain and R. Singh, 2008); genera *Alysicarpus* (Verma & al., 1988); *Crotalaria* (Verma & al., 1992); *Indigofera* (Verma and G. Shukla, 1992) and floristic diversity (Sinha and B.K. Shukla, 2004) from Bundelkhand region of Uttar Pradesh were also made. B.P. Uniyal & al. (1999) discussed the floristic diversity of undivided Uttar Pradesh. Nair and Nair (1977) presented an account of floristic studies carried out in Upper Gangetic Plain. Kumar (2001) enumerated the plant diversity along the course of river Ganga in Uttar Pradesh and other states. B.K. Shukla and

K.P. Singh (2007) discussed the diversity and conservation status of grasses of Uttar Pradesh. An account of sedges and Grasses of Eastern Uttar Pradesh was also published by A.K. Singh (2007). Apart from these, the preparation of checklist at state level was also undertaken. B.P. Uniyal & al. (1994) prepared the checklist of grasses of undivided Uttar Pradesh. S.K. Uniyal & al. (1997, 1999) published the checklists of Cyperaceae and other monocotyledonous plants. Khanna & al. (1999) also published the checklist of dicotyledonous plants of undivided Uttar Pradesh. But all these checklists do not serve the purpose because at present Uttarakhand - a state carved out from Uttar Pradesh is an independent state. To overcome this problem, again a checklist of Cyperaceae dealing with 128 species and 17 genera in the present political boundaries of Uttar Pradesh was published by V.P. Singh and R.C. Srivastava (2004). Some important floristic studies undertaken in some districts of the state include Agra (Watts, 1953; Bhardwaja & al., 1956); Allahabad (G.D. Srivastava, 1938; 1949; Panigrahi and Rajagopal, 1967a; 1967b; 1968; Panigrahi & Saran, 1968; Verma, 1973; Dubey and Agarwal, 1978; Verma and B.K. Misra, 1979; 1982; Misra and Verma, 1983; B.D. Sharma and Pandey, 1984); Banda (Sinha and Verma, 1986a; 1986b; 1987; 1988a; 1988b; 1992; 1996); Verma and Sinha, 1985a; 1986); Bahraich (Panigrahi & al., 1969; Saini, 2006a; 2006b; Maliya and Dutt, 2010; Maliya, 2012a; 2012b); Basti (S.K. Singh & al., 1985); Bijnor (J.P. Sharma and Murti, 1990; Khan, 2000); Bulandshahar (N.P. Singh, 1969); Deoria (A.K. Singh, 1994; 1995; 2006b); Fatehpur (S.K. Dixit & al, 1984a; 1984b; S.K. Dixit and Dutt, 1985); Gorakhpur (S.N. Dixit & al., 1966; Panigrahi and Saran, 1967; Sahai and Sinha, 1968; P.K. Gupta 1969; S.K. Singh and S.N. Dixit, 1972; Ansari, 1986; 1996; 2006; Ansari and Chandra, 1990; 1992; A.K. Srivastava & al. 1987; A.K. Srivastava, 1993; Saini, 1996); Hamirpur (Bhattacharya & al., 1964; Narain, 2000; 2001; 2005); Hastinapur, Merrut (Murty and V Singh, 1961a); Jaunpur (S.K. Singh and S.N. Dixit, 1969; S.K. Singh and O.P. Singh, 1979); Lakhimpur Kheri along with Dudhwa National Park (K.K. Singh, 1979; 1982a; 1982b; 1992; K.K. Singh and Bhati, 1979; K.K. Singh and Tomar, 1982; K.K. Singh and Maheshwari, 1984; 1985b); Lalitpur of Bundelkhand region (Verma and Ranjan, 1995; Ranjan and Verma, 1995; 1996; Ranjan, 1997; 2005); Lucknow (Patil, 1960; 1963; Kapoor, 1962a; J.G. Srivastava, 1963; Balapure and Srivastava 1964; P.C. Sharma, 1964; Trivedi and Sharma, 1965; Hussain and Kapoor 1970; Balapure, 1971; Saini, 1990; S.C. Singh and Shah, 1990; S.C. Singh and G.N. Srivastava, 2000; Rai & al., 2007); Mirzapur (J.G. Srivastava, 1955; Bhattacharya, 1963; 1964; G. Shukla and Verma, 1988); Moradabad (Paliwal and V.P. Singh, 1982); Mujaffarnagar (R.K. Gupta, 1961); Shahjahanpur (J.P. Sharma and Dhakre 1993; S.C. Sharma & al., 2007) and Varanasi (Joshi and Reddi, 1969; Roy, 1971; Varshney, 1971). In addition to above, few district floras have also been completed that include *Flora Gorakhpurensis* (T.N. Srivastava, 1976); *Flora of Allahabad* (B.K. Misra and Verma, 1992); *Flora of Agra* (A.K. Sharma & Dhakre, 1995); and *Flora of Lucknow* (S.C. Singh & Khanuja, 2006).

Aquatic and marshy vegetation of some wetlands of Uttar Pradesh has also been published. Sen (1959) worked on the aquatic and swampy vegetation of Gorakhpur; Sahai and Sinha (1968) on the supplement to the aquatic and swampy vegetation of Gorakhpur district; Bhattacharya and Malhotra (1964) on the aquatic plants of Mahoba in Hamirpur district; O.P. Singh and S.K Singh (1972) on the aquatic angiosperms of Jaunpur district; K.K. Singh and Tomar (1982) on the aquatic and marsh land flora of Kheri district; Maheshwari and Tomar (1983) on wetland flora of Sitapur district; A.K Srivastava & al. (1987) on the aquatic angiosperms of Gorakhpur; A.K Singh and S.K. Singh (1991) on the aquatic and semi-aquatic plants of Deoria district; N.P. Singh and R.C. Srivastava (2000) on the diversity and economic importance of wetland flora of Eastern Uttar Pradesh; Maliya and S.M. Singh (2004) on the diversity of aquatic and wetland macrophytic vegetation of Uttar Pradesh; Sinha and R.D. Dixit (2000; 2004) on the floristic composition of Salon wetland, Raibareli; A.K. Singh (2006a) on the aquatic and wetland flora of Varanasi; Sinha (2005) on the floristic diversity and vegetation composition of Lakh-Bahosi wetland, Kannauj; Maliya (2006) on the aquatic and wetland flora of Mainpuri district; R.C. Srivastava and C. Srivastava (2007) on the diversity and economic importance of wetland flora of Gorakhpur district; A.K Singh & al. (2008) on the macrophytes in water bodies of Varanasi district; M. Singh and Ali (2009) on the aquatic angiosperms of Mau district; Ahmad & al. (2011) on the uses of wetland plants of Deoband Tehsil in Saharanpur district; Maliya (2012b) on the aquatic and wetland macrophytes of Katraniaghat Wildlife Sanctuary of Bahraich district; Garg and Joshi (2014) on the impact of climate change in response to tree canopy and aquifer in Nawabganj Bird Sanctuary, Unnao district, etc. Recently Saini & al. (2010) made an important contribution dealing with complete account of 751 species of aquatic and semi-aquatic angiosperms and vascular cryptograms occurring in various wetlands from Eastern Uttar Pradesh.

In the context of medicinal and ethnobotanical resources, some important contributions include those of S.L. Nayar (1964); K.K. Singh & al. (1979; 1985; 1994); Maheshwari & al. (1981a; 1981b; 1986); Saxena and Vyas (1981); K.K Singh and Maheshwari (1983; 1985a; 1989; 1992); Maheshwari and J.P. Singh (1984; 1987); K.K. Singh and S.C. Singh (1985); H. Singh (1988); P.K. Srivastava & al. (1992); K.K. Singh and Prakash (1994; 1995; 1996a; 1996b; 1998; 2003); K.K. Singh (1996); Ranjan (1996; 1999); S.C. Singh and G.N. Srivastava (1999); Khanna and Kumar (2000); A.K Singh & al. (2002; 2009); Khanna (2002a; 2002b); S.C. Sharma (2002); H.P. Pandey and Verma (2002); C. Srivastava & al. (2003); Kumar & al. (2003); G. Shukla & al. (2003); Maliya and K.K. Singh (2003); R.C. Srivastava & al. (2003); R.D. Dixit & al. (2004); Prajapati and Verma (2004); Maliya (2004; 2007; 2009a; 2009b; 2009c; 2011a; 2011b); Upadhyay and J. Singh (2005); H.S. Pandey and Verma (2006a; 2006b); Narain and Juhi Singh (2006); Narain and Usha Singh (2006); Prakash and K.K. Singh (2006); R.C. Srivastava and C. Srivastava (2007); Awasthi & al. (2008); S.C. Singh (2008); C. Srivastava and A.K. Srivastava (2008); C. Srivastava (2009); Ahmad and Gupta (2010); Mohammed & al. (2011); C. Srivastava and S. Pande (2011); J. Singh (2010; 2012); Kar and Joshi (2014); Garg & al. (2014); Yadav & al. (2014), etc. Besides, a few sporadic publications on new species, new distributional records for the state and other interesting aspects of the state flora were also made by Kapoor and G.S. Srivastava (1960); Rau (1961); Murty and V. Singh (1961b; 1964; 1966); Kapoor (1962b); N.P. Singh (1964); Rajagopal (1965); Rajagopal and Panigrahi (1965; 1966); C.L. Malhotra (1966); V. Singh and Murty (1966;1967); S.N. Dixit and Siddiqui (1966); W. Hussain (1967; 1968); S.N. Dixit and A.K. Singh (1968); Siddique and S.N. Dixit (1969a; 1969b); Venkata Reddi (1969a; 1969b); Kapoor and Kapoor (1970); Tayal and Bhasin (1970); S.I. Husain and Kapoor (1971); V. Singh (1971); Bahadur & al. (1973); S.K. Gupta & al. (1980); Misra and Verma (1981; 1987); J.P. Sharma and S. Singh (1985); Sinha and Verma (1985; 1988a); Verma and Sinha (1985b); O.P. Misra (1992); Saini (1993); Tomar & al. (2008); Sreedevi & al. (2010); B.K. Shukla and Tiwari (2012); Tiwari and Ansari (2012; 2013; 2014) and A.K. Singh & al. (2013).

THREATS AND CONSERVATION: Conservation of biodiversity and its sustainable use is the main aim of Convention on Biological Diversity (CBD, 1992). In context of Uttar Pradesh natural and man made forest fire, floods in rainy season, excessive grazing by animals and high velocity wind storms are some of the significant factors responsible for the loss of forest vegetation in the state. It is commonly seen that species like *Grewia sapida, Olax nana, Erythrina resupinata, Curcuma angustifolia* etc. make their appearance on burnt ground and replacing original vegetation. Graziers intentionally make acute fire for getting new clumps of grasses for their cattles. The encroachment of forest land and conversion of wetlands by villagers and greedy builders for agricultural and constructions purposes, establishment and expansion of new towns and cities, widening of existing highways, construction of express ways and establishment of new industries have also caused great damage to the floristic composition of the state and also brought changes in environmental climate and fragmentation of habitats. Sometimes extensive climbers like *Antigonon leptopus, Capparis spinosa, Ipomoea hederifolia, Mukia maderaspatana* and invasive alien weeds like *Lantana camara, Eichhornia crassipes,* etc. cause great damage to the forest vegetation and wetland flora and do not allow other plants to grow freely. Another major cause of rarity is the over exploitation of species. Further, the gregarious growth of *Prosopis juliflora,* an invasive alien weed species, has lead to USAR and empty lands at several places and ravine vegetation in the Agra, Mathura and Etawah districts of the state into a kind of mono culture type of vegetation. This non edible species which can be used as fuel wood has out lived other woody, fodder species and grasses and thus causing major ecological imbalance in the ecosystem. The threatened species in the state may be considered for in *situ* and *ex-situ* conservation by the policy makers.

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UTTARAKHAND

Uttarakhand, a well known hilly terrain of Garhwal-Kumaun, was carved into the 27th state of the Indian Republic on 9th November 2000 as Uttaranchal. The state is located between 28°53'24"- 31°27'50" N latitude and 77°34'27"- 81°02'22" E longitude, spread in to *ca* 53,483 sq. km area covering mostly (46,035 sq. km) hilly terrain and some portion (7,448 sq. km) of terai and plain area. The western and southern boundaries of the state are shared with neighbouring Indian states of Himachal Pradesh and Uttar Pradesh respectively, whereas northern and eastern boundaries form the international border with China (Tibet) and Nepal respectively. Though patches of the dusty desert of the plains are encroaching on Uttarakhand, the region is still heavily forested and extremely hilly. The state lies almost wholly within the realm of the Himalaya and is very rich with natural resources. The glaciers in the high hills are the source of the Yamuna and Ganges.

It can be grouped into three geographical zones of high mountains, mid mountains and Terai; which is further sub-divisible into five ecological belts, namely the trans-Himalaya (cold desert), inner Himalaya (snow-bound zones), outer Himalaya (temperate zone), Sub-Himalayan hills (Shiwaliks) with Terai-Bhabar and northern part of the upper Ganga Plains. Within state boundaries the longest North-South distance is about 270 km while the maximum East- West distance between the rivers Yamuna and Kali is 324 km. The region is predominantly mountainous, except in the south, where plain areas border the foothills. Notably, the Nanda Devi (7817 m) situated in the Chamoli district is the highest peak in the state. The state is categorized under Ganga basin glaciated zone housing 1,439 glaciers and further subdivided into Yamuna, Bhagirathi, Alakananda and Ghagra valleys. The important glaciers include Gangotri, Milam, Pindari, Bandarpunch, Dokriani, Hurra, Hatta, Kedar, Rudra, Sarswati kharak, Khatling, Chorabari, Tipra, Satopanth, Bhagirath kharak, Sundardhunga, Nandadevi group, Dunagiri, Namik, Kafni, Martoli and Gonkha. Of these, the Gangotri glacier is the most significant as the origin of Ganga, the national river of India.

PHYSIOGRAPHY: On the basis of evolutionary history, stratigraphic sequences and component rock units, Pant (2000) divided the state into following four geographical units, viz. **i) The Trans Himalaya or Tethys Himalayan zone:** The northern slopes of the Greater Himalaya, lying in the rain shadow of the inner ranges, extended up to Tibetan plateau constitute the Trans Himalayan zone. The southern boundary of this zone is marked by Trans-Himadri Fault (THF). Covering the northern Garhwal [parts of Uttarkashi (Upper Jadh Ganga valley), Chamoli (Mana-Niti-Malari, Upper Dhauli valley)] and Kumaun [Pithoragarh (Upper Girthi valley: Rimkhim-Lapthal-Topidhunga, north of Milam and extreme north-east, Kutti-Yangti)] this zone marks the eastern end of Indian (West Himalayan) Cold Desert. The northern most water parting line constitutes an international boundary with China (Tibet). The altitude range varies between 4500 to 5700 m, except isolated areas, where it exceeds 6000 m, especially towards the West and Northwest. Uttarakhand Trans Himalaya is a relatively small dry region aligned in Northeast-Southwest direction with rocks exposed in Kumaun region. Towards the North, there are some well-known mountain passes (Mana: 5608 m, Niti: 5300 m, Balehadhura: 5353 m, Kungri-Bingri: 5564 m, LipuLekh: 5121 m and Lampya Dhura: 5533 m) which served as ancient Indo- Tibetan trade routes. Some of the important tributaries like Jahnavi/Jadh Ganga and Girthi Ganga originate from the trans-Himalayan glaciers; (ii) **The Greater Higher Himalaya or Himadri** The thick slab of 15-20 km composed of high grade metamorphics - the Vaikrita groups of Precambrian age intruded by tertiary granites form the Himadri Himalaya. Representing proterozoic basement, this domain is divisible into four formations: 1. Joshimath Formation; 2. Pandukeshwar Formation; 3. Pindari Formation and 4. Budhi Formation. This innermost zone of snow-covered high peaks such as Bandarpunch, Kedarnath, Satopanth, Nilkanth, Kamet, Gangotri, Gauri Parvat, Nanda Devi, Trishul, Nanda Ghunti, Nandakot, Panchchuli, Shivling shows elevation of 3000-7817 m. This zone with innumerable valleys, housing number of glaciers, serves as a water reservoir giving origin to some of the great rivers of India, such as Ganga, Yamuna and Kali. With component rocks subjected to compressional forces, this zone is largely composed of gneiss and granite; (iii) **The Lesser Himalaya** Delimited by the Main Central Thrust (MCT) in the North and Main Boundary Thrust (MBT) in the South, the Lesser Himalaya has a complex geological history and tectonic framework. This is the central part of the Himalaya sandwiched between southern Shiwaliks and northern Great Himalaya and called Middle or Lesser Himalaya. A series of ridges and spurs with enclosed rivers valleys and hills of varying altitudes between 800 m along the low river valleys to over 3000 m along the highest mountain ridges form the Lesser Himalaya zone between Greater Himalaya and Shiwalik. Many south flowing rivers takes their origin from snow bound higher reaches in this zone and have been instrumental in defining the topographical character of this zone. With a less severe climatic condition in comparison to the high altitude snow-fall zones and wider valleys with gentle slopes providing adequate opportunities for terrace agriculture, this zone constitutes the principal habitation zone of the state. Many rivers such as the Yamuna, Bhagirathi, Alakananda, Pindar, Western Ramganga, Gomati, Saryu, Kosi and Kali have created patches of level-land at several places that afford flourishing agriculture and (iv) **The Outer and Sub-Himalayan zone (Shiwalik ranges)** The outermost belt of foothills with more or less a continuous ranges showing abrupt fall in the average height constitutes Shiwalik ranges. Towards the south, the Shiwaliks are flanked by the foothills and Terai zones. The Shiwalik basin is formed by fluvial and lacustrine deposits and comprises Lower, Middle and Upper Shiwalik subgroups. The southern slopes of Shiwalik, through submontane track pass into the great Gangetic Plain of the north India. The foothills comprise a series of parallel ridges with steep south facing and a gentler north slopes aspects. This zone with decreasing width from east to west shows curious landscape features at the foothills and entrenched valley between the Lesser Himalaya and the Shiwalik, referred as Dun valleys. Aligned in roughly northwest-southeast direction and with average elevation of 1000 m, these ranges are thickly forested with scattered pockets of agriculture and population concentration. The geographical location of these frontal ranges and relatively lower elevations are important factors that govern the pattern of rainfall distribution along these ranges. Composed of a characteristic Post-Tertiary depositional phenomenon, this belt is subdivided into following zones: (a) **A. Bhabar and the Dun valleys:** Swift south-flowing streams on the southern faces of Shiwalik has resulted in washing of detritus and a consequent deposition of coarse material at the immediate foothills creating porous substratum suffering from a superficial absence of water, called 'Bhabar'. This zone is of recent geological origin and follows east- southeast-northwest trend with the width decreasing from 15 km in the east to 2 km in northwest. The south-westward parts enclose synclinal valleys filled with a recent or sub-recent gravel constituting 'Dun valley' at Dehradun, Kotbagh and Patli, which are the largest structural valleys developed along the foothills of Himalaya. (b) **Terai and the Plains:** The finer material from uphill with the ability to retain abundant surface water is carried a little farther from Bhabar and deposited in a belt called 'Terai'. It is a level belt towards the east and south-east and occurs as a broad zone of 10-20 km width. Southern districts of Haridwar and Udham Singh Nagar include northern parts of upper Gangetic Plain. The terai narrows down to 2-5 km width westwards. This zone has a super abundance of water. Due to widespread drainage control and other land reclamation schemes, the one-time swampy terai has now turned into a zone of fertile agriculture.

GEOLOGY AND SOIL: The sub-Himalayan zone is characterized by hog-back topography and Dun-type of structural valleys. The lesser Himalayan zone has deformed rock structures in the form of nappe sheets prone to landslides. The central crystalline zone is characterized by pinnacled peaks and deep gorges. The area is classified as high seismic zone type V. In general, this region experiences severe soil erosion and soils are quite shallow, gravelly and impregnated with fragments of parental rock. Important soil types found in the state are as follows:

Brown soil: Almora, Bageshwar, Champawat, Chamoli, Dehradun, Nainital, Pauri, Rudraprayag, Pithoragarh, Tehri, Uttarkashi

Bhabar soil: Champawat, Dehradun, Pauri, Nainital
Terai soil: Dehradun, Haridwar, Pauri, Nainital and Udham Singh Nagar
Alluvial soil: Haridwar

Depending upon vegetation, the soil can be grouped as brown forest soil in deciduous forest, acidic to neutral soils in evergreen forests and podozolic soils in conifer forests. In higher alpine regions, sub-alpine and alpine meadow soils form distinct categories. In sub-Himalayan tract red loam, forest soils, podsols and wisenboden are important types covering Bhabar, Terai and Plains and texturally shows loam, clay loam, and sandy loam.

RIVERS: Uttarakhand, the 'Land of Rivers' houses a complex web of an extensive snow-fed river system originating from equally complex network of glaciers, which serve as a perpetual water reservoir sustaining the life in India. A number of rivers and rivulets, locally known as gad, gadhera, nadi, rau or raula feed into the voluminous core river systems. In addition to glacier originating northern tributaries and seasonal rivulets of Terai-Bhabar arising from the forested zones of the lesser Himalaya, the region also houses a large number of lakes (tals) of various sizes and famous wells of Kumaun region called 'Naula'. Major river systems of the state are as follows: **I. The Ganga and its tributaries**: The entire Garhwal, except eastern parts of Dehradun and Uttarkashi is drained by the Ganga system. Originating from glaciers spread on opposite slopes of Chaukhamba, two main headwaters namely Bhagirathi and Alkananda confluences at Devprayag to form Ganga, which enters the plains at Haridwar. Fed by a large number of tributaries, this system has the largest number of affluents draining the parental river within the territory of the state as compared to the other drainage system of the region and covers large portions of the districts of Uttarkashi, Chamoli, Tehri, Rudraprayag and Pauri. It is formed by the following sub-systems:- A. The Bhagirathi sub-system- Originating at Gomukh (4200 m), at the base of Bhagirathi massif, the Bhagirathi runs in the Northwest direction at first and then to the south; B. The Alaknanda sub-system- Alaknanda originates from Alkapuri base of Satopanth glacier near Badrinath and meets Sarswati river near Mana. After flowing for a distance of *ca.* 195 km, the river meets Bhagirathi at Devprayag and is known as Ganga assuming a larger size. The Ganga covers about 66 km from Devprayag to Haridwar plains and C. The Nayaur sub-system- The Nayaur, comprising the western and eastern Nayaur, originating in Dudhatoli range of Pauri district, confluences at Satpuli and then following north-western direction, this united flow meets the Ganga at Vyasghat. **II. The Yamuna and its tributaries:** The western part of Uttarkashi, Tehri and Dehradun districts are drained by Yamuna-Tons system. The Yamuna, one of the greatest Himalayan rivers, originates from Kalindi glacier on the western slopes of Bandarpunch range and with contributions from Sauri Gad and Hanuman Ganga, drains a large part of Uttarkashi. **III. The Kali and its tributaries:** Kali, the largest river of Uttarakhand, rises at the Lipu Lekh pass in the extreme Northeast Kumaun and drains the entire eastern part of the state covering the districts of Bageshwar, Pithoragarh and Champawat. **IV. The Ram Ganga and its tributaries:** originating on the southern slopes of the Dudhatoli range, the system drains the south-central parts of the Kumaun division and eastern Garhwal. Mandal, the largest river in the Shiwalik of the eastern Garhwal confluences with Ram Ganga at Loharkhet. Before entering the Bhabar area at Kalagarh, the river receives contribution from many important tributaries.

CLIMATE: The diverse physiography has resulted in the creation of a wide spectrum of climatic zones. Broad climate types (Uniyal & *al.,* 2007) are listed in Table 1.

Table 1: Climate Types

Climate Type	Climate Sub-type	Elevation (m)	Precipitation and Temperature
Sub-tropical (Warm)	Terai and Plains	Up to 500	200-250 cm; 30°C for> 6 months
	Bhabar, Dun Valley	500-750	200 cm; 30°C or more for 3-5 months
	Lower Shiwalik	750-1000	100-300 cm; 25-35°C during summer only
Temperate (Lower Temperate) (Cool)	Outer mountain valley and upper Shiwalik	1000-1500	100-300 cm; 25-35°C during summer
	Dry slopes in lesser Himalaya	1000-1800	100 cm or less
	Lesser Himalaya (interior valleys)	1500-2000	15-20°C for 6 months 100 or less 20°C for 6 months
Temperate (Upper temperate) (Cool/cold)	Lower altitudes in greater Himalaya	1800-2200	Up to 150 cm, 15°C for 6-8 months
	Higher altitudes in greater Himalaya	2000-2800	Up to 200 cm, 5-10°C for 9 months
Sub-alpine (Cold)	Higher Himalaya upto tree line	2500-3300	Snowfall for 6 months, 0-5°C for 6 months
Alpine (Cold)	Higher Himalaya beyond tree line Meadows, Glaciated valleys perpetually snow-bound zone	3500<	Snowfall for 6 months, 0-10°C for 6-9 months
Arctic (Extreme Cold)	Trans-Himalaya Cold Desert	3500<	Rain shadow and High montane Arctic zone

VEGETATION: Of the total geographical area of 53,483 sq. km in the state, nearly 38,000 sq. km (71.05%) is under recorded forest area. This includes 69.86% Reserved Forests, 26.01% Protected Area and 4.13% Unclassified Forests. Further, of recorded forest cover of 24,295 sq. km (45.43% of state's geographical area), 4,969 sq. km is under Very Dense Forests; 12,884 sq. km under Moderately Dense Forests and 6,442 sq. km under Open Forests. The area increases to 25,062 sq. km (46.86%) adding 767 sq. km of tree cover. The vegetation and forests of the state are broadly grouped into following types based on altitude, physiography and species composition viz - **Grasslands of Upper Gangetic Plain:** Small to moderate-sized grassland is a common feature in sub-tropical regions of Upper Gangetic plains and terai regions of Garhwal-Kumaun, including river basins covering Rajaji and Corbett National Parks, along with corridors and parts of Duns; **Sub-tropical moist deciduous Sal forest:** Foot hills of Bhabar and entrenched Dun valleys between Himalaya and Shiwalik, up to 750 m, shows this type of forest. Extensive and gregarious belt of Sal (*Shorea robusta*) form signature forest of terai and shiwalik belts. These forests are usually categorised into three types: Terai (Tarai) Sal, Bhabar Sal and Hills; **Moist Mixed Deciduous Forests:** Riverine forest are usually flanked by this type of forest, which occupies the raised terraces and plateaus of Bhabar deposits. Such open forests are common throughout foothills, plains and adjoining parts. At some places of grasslands form dominant belts in such forests; **Riverine Forest [Swamp and Khair-Shisham (*Acacia-Dalbergia*) forest]:** These types of forests occur along river banks in Duns, Terai and to limited extent in outer hilly regions, ascending to 800 m. These are sometimes divided into Swamp type, Moist miscellaneous type and High-Hill ravines; **Northern Dry Mixed Deciduous Forests:** These forests dominate all aspects of central and outer hill ranges at the base of Chir forests and show locally differing floristic composition; **Pine (Chir Pine- *Pinus roxburghii*) forest:** This is the most dominating forest type throughout the state in the 1000-1500 m elevation zone and is further divided in to Sub-tropical or lower Shiwalik Chir Pine Forest and Upper or Himalayan Chir Pine Forest; **Upper West Himalayan Temperate forest**: Elevation belt of 1800-2000 m on northern slopes, in ravines and extended to 2300 m on southern aspects is occupied by temperate broad-leaved forests; **Oak Forest (Upper West Himalayan Temperate Broad-leaves Forests):** Three principal Oaks, Banj (*Quercus oblongata, Q. leucotrichophora*), Moru (*Q. floribunda*) and Kharsu (*Q. semecarpifolia*) occupies more or less distinct elevation zones. Due to moist soil and high atmospheric humidity, trees here are draped by thick covering of epiphytic mosses, ferns, lichens and epiphytic angiosperms like Orchids, Asclepias etc.; **West Himalayan Upper Oak-Fir Forest (*Quercus-Abies* Forest):** Inner Himalayan slopes at 2000-3300 m elevations are covered by low-level Silver Fir, forming continuous dense forests. Though, these forests are usually restricted to central ranges, but exceptionally occur in outer hills as Denthal on the east of Nainital and Thali reserve of Nainital; **Cypress (*Cupressus torulosa*) Forest**: Himalayan Cypress forests occur on mid-elevation slopes of main Himalayan ranges. It forms either continuous forests or small scattered patches at 1500-2800 m elevation; **Lauraceous Mixed Broad-Leaved Forest:** This subtype include Oak mixed broad-leaved forests dominated by Lauraceous members belonging to *Litsea*, *Neolitsea*, *Persea*, *Machilus*, *Dodecadenia grandiflora* and *Lindera pulcherrima* at 1500-2700 m elevation; **Upper Temperate Sub-Alpine Mixed Broad-leaved/Moist Deciduous Forests:** These forests occur at (1800-)2000-2500 m elevation and represent wide range of broad-leaved species; **Sub-Alpine Shrubberies/Sub-Alpine Scrubs:** Throughout Garhwal-Kumaun, sub-alpine slopes at 2700-3500 m elevation are covered by shruby thickets of *Rhododendron campanulatum* forming *Krummholtz* vegetation; **High Altitude Forests:** Vegetations of the inner Himalayan valleys at 2500-3500 m elevations include high altitude Conifer and Broad-leaved forests with very high species diversity of Conifers, Oaks, Rhododendrons and other Rosaceous members; **Blue Pine (*Pinus wallichiana*) Forest:** Standing between the northern Birch-High-Level Fir and southern Deodar-Cypress forests, Blue Pine forms an extensive forests throughout the inner Himalayan valleys at 2000-3600 m elevation. The species composition and associate vegetation varies in different altitudes; **Spruce (*Picea smithiana*) Forest**: This forest mostly occur to the south of the main Himalayan ranges, often on limestone and localities with comparatively low rainfall at 2000-3200 m elevation; **Western Himalayan Sub-Alpine Fir Forest [High level *Abies* Forest]:** High level Silver Fir (*Abies spectabilis*) usually forms scattered patches at 2700-3300 m, especially on the northern aspects, often in association with *Quercus semecarpifolia* and *Betula utilis* and never form large continuous forests; ***Hippophae-Myricaria* scrubs (Riverine Bushes/ Bushlands):** This type of scrubby vegetation is composed of Hippophae, Myricaria, Salix, Myrtama etc. forming bushes along river banks and streams. **Deodar/Devdar (*Cedrus deodata*) Forest:** Extensive pure strands of *Cedrus deodara* dominate inner ranges at 2200-3200 m elevation throughout the state; **Riverine Blue Pine (*Pinus wallichiana*) Forest:** These are found in the inner ranges and represent more or less pure strands or sometimes mixed with scattered Birch; **Western Mixed Conifer Forests:** These are restricted to inner valleys and mostly comprises alpine conifers, sometimes forming overlapping patches with Deodar and other broad-leaved species; **Birch or Bhoj (*Betula utilis*) Forest:** Extending from sub-alpine regions to alpine tree line at 4000 m, dense pristine Birch or Bhoj forest is the signature vegetation type of Uttarakhand; **Birch-*Rhododendron* Forest:** Occurring at higher elevation and reaching up to the tree-line, it comprise *Betula utilis* as its main component, mixed with Rhododendrons and other alpine species; ***Rhododendron-Cassiope* scrub:** Occur in high-elevation rocky slopes, dominated by species of Rhododendron and intermixed with grassy patches and cushionoid herbs; **Alpine Scrubs [Alpine Dry Scrubs]:** Such vegetation usually occur between tree-line and the snow-line and in open dry arctic Trans Himalayan valleys; **Dwarf Juniper Scrub:** It occurs in the greater and trans Himalayan valleys throughout the state, mostly as shrubby patches, often covering considerable slopes and indicates dry arctic condition; **Alpine Meadows [Bugyals]:** This is the most common and dominant type of vegetation throughout the alpine region of the state. Commonly known as Bugyals or Pamaya in Byans valley, this type of vegetation comprise tall forbs, mixed herbaceous formations and alpine scrubs; **Arctic, High-Montane and Trans Himalayan Cold Desert vegetation:** The high altitude trans-Himalayan valleys and southern part of Tibetan plateau usually form the eastern part of Indian Himalayan Cold-Desert, which falls in Uttarakhand. The cold-arctic condition has resulted in unique floristic diversity, chiefly comprising bushy scrubs of *Artemisia*, *Caragana*, *Ephedra*, *Juniperus*, *Rosa* etc. It is often found mixed with scattered dwarf trees of *Pinus wallichiana*.

PLANT DIVERSITY: Uttarakhand, in terms of its plant wealth, is one of the richest state in India. The state harbours 4800 taxa [5000, including cultivated] of flowering plants representing 1400 genera (1450, including cultivated) of 215 families, thus accounting for slightly over 26% of the total Indian flowering plants. Angiosperms include 4781 taxa under 1391 genera and 211 families, whereas wild gymnosperms are represented by 19 species under 9 genera of 4 families. Amongst angiosperms, the dicots are with 3616 taxa under 1078 genera and 175 families while the monocots are represented by 1165 taxa under 313 genera and 36 families. Among the dicots, family Asteraceae has the largest number (134) of genera, followed by Fabaceae (80), Lamiaceae (49), Apiaceae (48), Brassicaceae (43), Rubiaceae (32), Euphorbiaceae (30), Boraginaceae (27), Caryophyllaceae (25), Rosaceae (24) and Asclepiadaceae (24). Similarly, dominant monocot genera are represented by Poaceae (124), Orchidaceae (71), Cyperaceae (19), Liliaceae (16), Araceae (12) and Commelinaceae (10). In dicots, the family Asteraceae has the maximum number of species (370), closely followed by Fabaceae (351), Rosaceae (207), Lamiaceae (146), Ranunculaceae (122), Brassicaceae (102), Apiaceae (95), Euphorbiaceae (91), Malvaceae (83), Caryophyllaceae (82) and Rubiaceae (78) and in monocot family Poaceae bear largest number of species (485), followed by Orchidaceae (242), Cyperaceae (187), Araceae (33), Commelinaceae (25), Juncaceae (22) and Zingiberaceae (22).

ENDEMIC AND RARE PLANTS: Two genera viz., *Kashmiria* D.Y. Hong (*K. himalaica* (Hook.f.) D.Y. Hong and *Pseudodanthonia* Bor (*P. himalaica* (Hook.f.) Bor & C.E. Hubbard and 107 taxa are endemic to the state. Few other endemic taxa are *Peucedanum dehradunense* Babu, *Impatiens kaliensis* Grey-Wilson, *Berberis garhwalensis* C.K. Schneid., *Mahonia jaunsarensis* Ahrendt., *Carex nandadeviensis* Ghildyal, U.C. Bhattach. & Hajra, *Astragalus nainitalensis* L.B. Chaudhary, *A. uttaranchalensis* L.B. Chaudhary & Z.A. Khan, *Corydalis devendrae* Pusalkar, *Gastrochilus garhwalensis* Z.H. Tsi, *Peristylus kumaonensis* Renz, *Rumex gangotrianus* B.S. Aswal & S.K. Srivast., *Ranunculus uttaranchalensis* Pusalkar & D.K. Singh, *Rubus alomorensis* Dunn, *Valeriana mussooriensis* Ved Prakash, Aswal & Mehrotra, etc. The floristic wealth of the state is threatened due to number of natural and anthropogenic causes. Ninety four threatened and conservation target species are present in this state. Some endangered species are *Aconitum lethale* Griff., *Cypripedium hamalaicum* Hook.f., *Fritillaria roylei* Hook., *Nardostachys jatamansi* (D. Don) DC., *Picrorhiza kurroa* Royle, *Taxus wallichiana* Zucc., etc. and Critically Endangered species are *Berberis lambertii* R.N. Parker, *Dipcadi reidii* Deb & S. Dasgupta, *Gentiana saginoides* Burkill, *Lilium polyphyllum* D. Don, *Panax pseudoginseng* Wall., *Trachycarpus takil* Becc., etc.

FOREST RESOURCES: In Uttarakhand wild plants have substantially influenced the lifestyle of local population including culture, food, settlement, healthcare and medicine, economy and business. From fuel to construction work and from religious use to medicinal treatments, the plants have become an irreplaceable component for survival in the hilly area. In addition to its role in ecological security, this floristic diversity also contributes towards the economic benefits as a source of timber, medicine, food, vegetable oil, gums, resins, spices, fibre and flosses, dyes and tannins, beverages, narcotics, fodder, insecticides and pesticides, etc.

TRIBAL POPULATION: The schedule Castes population of this state is 1517186 which is 17.87 percent of the total population of the state and Schedules Tribes populations is 256129 which is 3.02 percent of the total population of the state. Bhotia, Buksa, Jaunsari, Raji and Tharu are the major tribal communities in the state. The tribal communities of district Chamoli, Uttarkashi and Pithoragarh are engaged in weaving woollen carpets, shawls, pankhis and blankets.

PROTECTED AREAS: The state has one Biosphere Reserve viz., Nanda Devi Biosphere Reserve (6407.03 sq. km), six National Parks (NP) (including two Tiger Reserves viz., Corbett Tiger Reserve and Rajaji Tiger Reserve) i.e. Corbett NP (520.82 sq. km), Gangotri NP (2390.32 sq. km), Govind NP (472.08 sq. km), Nanda Devi NP (624.62 sq. km), Rajaji NP (820.42 sq. km) and Valley of Flowers NP (87.50 sq. km) and seven Wildlife Sanctuaries (WLS) i.e. Askot Musk Deer WLS (599.93 sq. km), Binsar WLS (47.07 sq. km), Govind Pashu Vihar WLS (957.96 sq. km), Kedarnath WLS (957 sq. km), Binog-Mussoorie WLS (10.82 sq. km), Sonanadi WLS (301.18 sq. km) and Nandhour WLS (256 sq. km) and four Conservation Reserves (CR), viz., Asan Wetland CR (444.40 sq. km), Jhilmil Jhil CR (3783.50 sq. km), Nainia Devi Himalayan Bird CR (1119 sq. km) and Pawalgarh Bird CR (5824.76 sq. km).

BOTANICAL HISTORY: The earliest attempt to collect plants from Uttarakhand was made by Nathaniel Wallich (1825–1826), N. Vicary (1833-1834), Hugh Falconer (1837-1838), Victor Jacquemont (1824-1834), T. Thomson (1839) and W. Griffith (1839-1840). Col. Edward Madden (1805-1856) collected plants from Pindari glacier. Griffith (1830) collected plants from Dehradun environs. Duthie collected plants from adjoining Garhwal, Sir G. King and Col. Anderson from Kumaun, Col. Davidson from Bhagirath valley, Nainital; Edgeworth from North Garhwal-Chamoli, Mackinnon and Gollan collected orchids from Garhwal-Kumaun. Four milestone publication namely, 'The Forest Flora of North West and Central India' by D. Brandis (1874), 'Flora of Upper Gangetic Plain and of the adjacent Siwalik and sub-Himalayan tract' by J.F. Duthie (1903-1911), 'Forest Flora of Kumaon' by Osmaston (1927) and 'Forest Flora of School Circle' by Kanjilal (1901), which was later revised and enlarged by B.L. Gupta in 1828 under the title 'Forest flora of Chakrata, Dehradun and Saharanpur Forest division'. M.B. Raizada (1931-1958) has written 'Supplement to the Flora of Upper Gangetic Plain' and 'Grasses of Upper Gangetic Plain'. In the post-independent period, H.G. Champion made collection in Nainital and surrounding areas. K.C. Sahni surveys this state in 1950's. R.K. Gupta (1956, 1957, 1962), A.C. Dey, M.R. Uniyal and V. Shankar (1968) explored the area between Bhilangana and Bhagirathi rivers. Ghildyal made two exploration trips to the Valley of Flowers and other parts of Garhwal and listed 289 species in 1957. Wadhwa & al. (1987) and Kala & Rawat (2004) surveyed the valley and reported 520 species of vascular plants, later K.R.K. Murthy (2011) provided pictorial account of 289 species from this valley. Significant contribution of this area by R.K. Gupta was 'Flora Nainitalensis' (1968) and 'The Living Himalaya' which was the first consolidated account of floristic diversity of Garhwal Himalaya. Raizada & Saxena (1878) documented 'Flora of Mussoorie'. M.A. Rau surveyed Alakananda, Mandakini, Bhagirathi valley, Valley of Flowers and Yamnotri. He wrote 'Flowering Plants and Ferns of North Garhwal' (1963). T.A. Rao explored Pindari and Milam Glacier; N.C. Nair, Bipin Balodi and C.L. Malhotra in Gori ganga valley; C.M. Arora collected Orchids; C.R. Babu published 'Herbaceous Flora of Dehra Dun' in 1977 and P.K. Hajra and B. Balodi published 'Plant Wealth of Nanda Devi Biosphere Reserve in 1995. A.K. Goel studied 'Herbaceous flora of Tehri district' (1978-1983) and P.C. Pant published 'Flora of Corbett National Park' (1986). R.R. Rao explored Alpine Flora, D.K. Singh (Bryophytes, flowering plants), H.J Chowdhery (Western Himalayan Orchid), S.K. Murti and S.K. Srivastava (Cold Desert), J.N. Vohra (Mosses), N. Ghildyal (Cyperaceae), S. Garg (Gentianaceae), S. Singh (Flora), H.C. Pande (Ferns, Corbett NP), K. Ambrish (Champawat and Nandhour WLS, B.S. Kholia (Ferns), P. Pusalkar (Gangotri National Park, Alpine and periglacial flora), etc. D.S. Rawat made many floristic explorations in the interiors of alpine Uttarakhand and contributed significantly by noteworthy discoveries and rediscoveries of many rare and endemic species. G.S. Rawat of WII, Dehra Dun pioneered his research in late 70's on high altitude herbaceous flora of Kumaun region.

THREATS TO THE BIODIVERSITY: The cause of threat to the nature and its resources are almost similar all over the world in the form of natural and man-made causes. Floods, soil erosion, landslides, earthquakes, natural competition between the species, biology of species mainly the pollination in the absence of suitable pollinator, natural regeneration, diseases and extension of the alien weedy elements etc. are some of the major natural causes responsible for the destruction of the natural vegetation. The major man-made causes are: population explosion, timber for building purposes, furniture, fuel wood, grazing and fodder, forest fires, exploitation of economically important plant species, development activities and agriculture. These factors have alarmingly reduced the forest cover resulting in severe loss of natural living and non-living resources. Therefore, it is necessary to conserve the available natural resources through various effective conservation programmes.

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UTTAR PRADESH & UTTARAKHAND

Flora, Vegetation, Forestry and Ecology

1. **Adhikari, B., Kapkoti, B., Lodhiyal, N. & Lodhiyal, L.S. 2018.** "Diversity of herbs in some sal forests in Shiwalik region of central Himalaya, India". *J. Non-Timber Forest Prod.* 25(1): 41–45.

   Abstract: Present study was carried out to assess the composition, structure and diversity of under canopy herbs in three different sal forests in Shiwalik region of Central Himalaya, India. Study was based on the random sampling by quadrat method in the forests to quantify the herbaceous flora. Total 36 species belonging to 19 families were present at the sites. The herb density range from 15.38-48.51 ind m^{-2} in sal dense, sal mixed dense and sal open canopy forests. The range of species diversity of herbs was 3.37-3.59, concentration of dominance 0.113-0.154, equitability 0.71-1.07, β-diversity 1.2-1.8 and evenness 6.39-6.67 in the forest. Species richness was maximum (31) in sal forest with open canopy. Present study indicated that open canopy has significant impact on herbaceous ground flora. Thus it is concluded that the canopy cover, proper light intensity to the ground surface and proper space in between the tree species have impact on the understorey vegetation of forests.

2. **Adhikari, B.S. 2004.** Ecological attributes of vegetation in Nanda Devi National Park. In: *Biodiversity Monitoring Expedition Nanda Devi 2003*. A Report, Ministry of Environment & Forests, Govt. of India. Uttaranchal State Forest Department, Dehra Dun. Pp. 15–38.

3. **Adhikari, B.S. & Babu, M.M. 2008.** "Floral diversity of Baanganga wetland, Uttarakhand, India". *Check List* 4(3): 279–290.

   Abstract: Baanganga wetland, a 45 km long channel originates near Bishenpur and flows in Idrishpur-Chakheri forest block of Haridwar district in Uttarakhand, India represents riverine ecosystem. The study area harbors many islands, varying in shape and size, which remains underwater during the rainy season and provide a good habitat to various plant taxa, birds (resident as well as migratory) and animals mainly Swamp deer (*Cervus duvauceli duvauceli*), a critically endangered species and Hog deer (*Axis procinus*). To asses the status and distribution of flora, trips were conducted in the intensive study area. The plants were classified based on their habit and their presence was visually observed. A total of 178 plant species were recorded, of which 40 species (hydrophytes) were found in aquatic habitat, 122 species on moist shores and 117 species in upland habitat. *Phragmites karka, Polygonum barbatum, Ipomoea carnea* and *Typha elephantina* were the most common species in all the habitats. The majority of plants (40) are from Indian oriental region. The moist shore and upland habitats had maximum similarity (64%) followed by aquatic and moist shore (26%) habitats. The status of flora and management of Baanganga wetland ecosystem has been discussed in the paper.

4. **Adhikari, B.S. & Rawat, G.S. 2012.** Structural and functional attributes of forests along an altitudinal gradient in Garhwal Himalaya. In: Negi, G.C.S. & Dhyani, P.P. (Eds.), *Glimpses of Forestry Research in the Himalayan Region*. Special Issue on International Year of Forests- 2011. G.B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora, Uttarakhand, India. Pp. 39–50.

5. **Adhikari, B.S., Dhaila-Adhikari, S. & Rawat, Y.S. 2000.** "Structure of Himalayan moist temperate cypress forest at and around Naini Tal, Kumaun Himalayas" *Oecologia Montana* 7(1-2): 21–31.

Abstract: The paper deals with the structural features of a subsidiary edaphic and seral type of Himalayan moist temperate cypress (*Cupressus torulosa* Don.) forest that occurs between 2,100-2,325 m elevation in the exposed sites in Nairn Tal, Kumaun Himalaya. The tree density ranged from 270 (ridge top) to 510 trees/ha (mid-hill slope) and total basal cover from 26.6 to 51.5 m^2/ha (both mid-hill slopes). Total tree layer phytomass ranged from 237 to 400 t/ha (both mid-hill slopes), of which dominant species accounted for about 41 to 89% (both on ridge top). The natural catastrophes (snowfall or heavy windstorms) lead to the distribution of tree density and phytomass of present study forests. The root: shoot ratio ranged from 0.114-0.434 and photosynthetic:non photosynthetic ratio from 0.027-0.140. The total phytomass of present study forests ranged from 239 to 433 t/ha. The comparison of present studied cypress forests with other coniferous forests, viz., *Pinus, Abies, Picea* and *Pseudotsuga* has also been discussed.

6. **Adhikari, B.S., Uniyal, S.K. & Rawat, G.S. 2009.** "Vegetation structure and community patterns of Tehri Dam submergence zone, Uttarakhand, India". *EurAsian J. Biosci.* 3(6): 40–49.

Abstract: The present paper deals with the vegetation structure and community patterns within and between various plant communities in the Tehri Dam Submergence Zone in Garhwal, in the western Himalaya, Uttarakhand, India. The submergence zone is comprised of two valleys, the Bhagirathi submergence zone and the Bhilangna submergence zone. Four major plant communities were identified in both the submergence zones with varied associations through TWINSPAN. Most of the communities are similar in both the submergence zones, while their associations altered due to the micro-climatic variations. The species richness and diversity was high in most of the sites in the Bhagirathi submergence zone compared to the Bhilangna submergence zone, where species richness and diversity were more or less similar in most of the sites. The evenness values in most of the sites indicate that the species were distributed evenly in the Bhagirathi submergence zone, while heterogeneously in most of the sites in the Bhilangna submergence zone. However, the rate of species change, for example, the ß- diversity was higher in the Bhilangna submergence zone compared to the Bhagirathi submergence zone. The biomass of *Lantana* (74.5%) was high for the entire submergence zone compared to *Carissa* (25.4%), with respect to the total available biomass for both species. However, the extraction was more for *Carissa* (2.2%) as compared to *Lantana* (1.2%), with respect to the total biomass of each species.

7. **Adhikari, B.S., Rikhari, H.C., Dhaila, S. & Rawat, Y.S. 1996.** "Regeneration status in high altitude forests in a part of Kumaun Himalaya". *Ann. Forest.* 4(1): 41–46.

Abstract: The paper deals with density-diameter (d-d) distribution of trees and current regeneration status of high altitude (2100-2500 m) forests at and around Pindari Glacier in a part of Kumaun Himalaya. The young forested sites showed good regeneration potential, whereas old forested sites had regeneration problem. Light demanding species were experiencing regeneration problem except *Alnus nepalensis*, while shade demanding and/or shade tolerant species exhibited better regeneration except *Acer caesium*.

8. **Adhikari, B.S., Rikhari, H.C., Rawat, Y.S. & Singh, S.P. 1991.** "High altitude forest: Composition, diversity and profile structure in a part of Kumaun Himalaya". *Trop. Ecol.* 32(1): 86–97.

Abstract: A phytosociological analysis was made of 10 high altitude forest communities at 2150-2500 m altitude in the Kumaun Himalaya, Uttar Pradesh, within the catchment of the R. Pindar, in Almora District. Total density and basal area for the tree layer varied from 320 to 1600/ha and 44 to 98 m^2/ha, respectively. *Chimonobambosa falcata* was the dominant shrub species in most of the stands. Most of the tree species exhibited random distribution whereas the shrub species were distributed contagiously. A total of 6 forest types were identified in the ordination field on the basis of Importance Value Index (IVI). These had dominant tree species of *Abies pindrow* (4 stands), *Aesculus indica* (2), *Rhododendron arboreum* (1), *Quercus floribunda* (1), *Alnus nepalensis* (1) and *Acer mono* (1), respectively. Diversity for tree and shrub layers ranged from 0.81 to 3.55 and 0.05 to 1.33, respectively. The vegetation profile indicated 3 tree strata in most of the stands.

9. **Agarwal, A. 1996.** Analysis of vegetation and landuse in Khanda watershed, Garhwal Himalaya using remote sensing and conventional techniques. Ph. D. Thesis, H.B.N. Garhwal University, Srinagar (unpublished).

10. **Agarwal, A.K. & Rajwar, G.S. 2010.** "Macrophytes of Tehri Dam Reservoir, Garhwal Himalaya, India". *Asian Australasian J. Pl. Sci. & Biotech.* 4(1): 81–85.

Abstract: One hundred and seventy six species of macrophytes (154 herb, 14 shrub and 8 tree species) belonging to 58 families of angiosperms were recorded in the present study on macrophytes of Tehri Dam reservoir in Garhwal Himalaya during 2003-2005. The family Asteraceae was the most dominant among the macrophytes consisting of 25 species. The second largest family was Papilionaceae with 16 species followed by Poaceae with 14 species. The largest genus was *Ageratum* with 4 species. *Cyperus, Euphorbia, Sida, Crotalaria* and *Ranunculus* have 3 species each. Twenty genera consists of 2 species each and all other genera had one species each. Comparatively, fewer macrophytes appeared in July and August, showing thinner growth, while maximum growth was recorded in December and January.

11. **Agarwal, R. & Chandra, V. 2019.** "Diversity of wild edible plants in the Mandal-Chopta forest, Uttarakhand". *J. Med. Pl. Stud.* 7(1): 89–92.

Abstract: Wild edible plants (WEP) provide staple and supplement foods, as well as cash income to local communities, thus favouring food security. However, WEP are

largely ignored in land use planning and implementation, economic development, and biodiversity conservation. Moreover, WEP-related traditional knowledge is rapidly eroding. The information was collected through focus group discussions and key informant interviews. The methods employed in the study were designed with the purpose of providing baseline information on the use of plant species in local system through village surveys and field visits to various areas in the villages of Chamoli district falling under the boundaries of Mandal-Chopta Forest in Garhwal Himalayas, Uttarakhand. The diversity of wild edible plants being use by the local inhabitants is 64 species belonging to 47 genera and 36 families. Most of the species were used as fruits (30 species) followed by as leafy vegetables (20). Almost half of the species (51%) were also used for purposes other than food. From the species with market value (28% of the total). Further studies revealed that WEP are threatened mostly by habitat destruction, land-use change and over-harvesting. Some of these plants are crop wild relatives and could thus be used for crop improvement.

12. **Agarwal, S.K. 1984.** *Flora of Chakrata Tehsil.* Ph. D. Thesis. H.N.B. Garhwal University, Srinagar (unpublished).

13. **Agarwal, S.K. 2017.** *Flora of Jaunsar-Bawar [Chakrata Hills, Western Himalaya]: with ethnobotanical notes.* Bishen Singh Mahendra Pal Singh, Dehra Dun.

14. **Agni, T., Pandit, A., Pant, K. & Tewari, A. 2000.** "Analysis of tree vegetation in the Tarai-Bhabhar tract of Kumaun central Himalaya". *Indian J. Forest.* 23(3): 252–261.

    Abstract: The present study was undertaken to assess the regeneration pattern, tree diversity and qualitative characters of forests in the Tarai-Bhabhar belt of Kumaun central Himalaya, India located between latitude 29°25' to 29°40' N and 78°45' to 79°05' E longitude and between an altitudinal transect of 200-800 m. The total tree density varied from 4.3 trees/100 m^2 to 11.2 trees/m^2 and the tree diversity from 0 to 2.18. Absence of young regeneration of all the important dominant species showed the inability of these forests to produce progenies due to repeated burning by the U.P. State Forest Department and severe biotic pressure, by both wild and domestic animals.

15. **Agnihotri, P. & Hussain, T. 2012.** "A supplement to the flora of Nainital, Uttarakhand". *Indian Forester* 138(9): 812–818.

    Abstract: The present paper deals with taxa, which are additions to the flora of Nainital in Uttarakhand. Each species is provided with correct botanical name, important synonym(s), if any, diagnostic character, flowering and fruiting period and occurrence. Nomenclature for each species has been updated.

16. **Agnihotri, P. & Hussain, T. 2013.** "An overview of genus *Saxifraga* L. in Indian Himalayas". *Ann. Pl. Sci.* 2(8): 278–283.

17. **Agnihotri, P., Husain, D., Singh, H. & Hussain, T. 2016.** "Revisiting the *Delphinium viscosum* Hook.f. & Thoms. (Ranunculaceae) complex in the Himalaya". *Taiwania* 61(1): 16–20.

    Abstract: The paper highlights the complex nature of *Delphinium viscosum* Hook. f. & Thoms. in the Himalaya and enumerates two subspecies and two varieties. Critical appraisal of the morphological and distributional data revealed that subsp. *viscosum* and subsp. *gigantobracteum* having two varieties var. *gigantobracteum* and *chrysotrichum* are distinct. *Delphinium viscosum* complex is solved out and two subspecies and two varieties with clear cut distinct macro and micro-morphological characters have been identified. The taxonomic status of different taxa of this complex species has been established. *Delphinium viscosum*, a taxonomic complex species is described and illustrated.

18. **Agnihotri, P., Jena, S.N., Husain, D. & Husain, T. 2014.** "Perspective of the genus *Delphinium* Linnaeus (Ranunculaceae) in India". *Pleione* 8(2): 344–352.

Abstract: The present work deals with enumeration of 27 species, one sub-species and one variety of the genus *Delphinium* Linnaeus (Ranunculaceae) from India. Out of total 29 taxa, 15 are confined to the Western Himalayan region, while Eastern Himalaya is enriched with 11 taxa, one species, *D. malabaricum* is endemic to Western Ghats of South India. The genus forms the group of high altitude flowering plants and maximum diversity has been observed between 4000–4500 m asl. Very showy flowers for ornamental purposes and variety of alkaloids having spectacular medicinal values add the economic.

19. **Agrawal, A.K., Dhasmana, R. & Negi, K.S. 1991.** Species composition, diversity index and regeneration potential of some dominant forest communities of outer Garhwal Himalaya. In: Rajwar, G.S. (Ed.), *Advances in Himalayan Ecology*. Today & Tomorrows Publishers, New Delhi. Pp. 47–58.

20. **Agrawal, B. 1984.** "Plant climate, species diversity and concentration of dominance in some grazing lands of Garhwal Himalayas". *Geobios* 11: 168–173.

Abstract: The paper reports the plant climate, species diversity and concentration of dominance in certain grazing lands of Garhwal Himalayas. Analysis of the biological spectrum indicates therocryptophytic plant climate. The highest value of concentration of dominance was recorded for *Themeda anothera*, while the lowest for *Cynodon dactylon*.

21. **Agrawal, S. 1983.** "A note on *Gentianella glanduligera* Airy Shaw". *Indian Forester* 109: 576–577.

Abstract: Airy Shaw while describing *Gentianella glanduligera* in 1943 stated that it was unknown in wild state. Recently, however, it has been collected in wild state in India and is being reduced to a varietal rank under *Gentianella maddenii* (Clarke) Airy Shaw. T.A. Rao collected a specimen in 1957 from Kumaun hills and identified it as *Gentiana recirvata* Clarke; it was recorded by him as new for the North-West Himalaya. A critical study of this specimen revealed that it actually belonged to *Gentianella glanduligera* Airy Shaw having smaller stems and flowers than the *Gentianella maddenii* (Clarke) Airy Shaw; protologue and icon of the species confirmed the identity.

22. **Agrawal, S. 1984.** "Note on *Gentiana clarkei* Kusn. var. *acuminata* (Clarke) Kusn. (Gentianaceae)". *J. Econ. Taxon. Bot.* 5(2): 433–435.

Abstract: *Gentiana clarkei* Kusn. (syn. *G. pygmaea* Clarke) is treated as a synonym of *Gentiana prostrata* Haenke and a new combination *G. prostrata* Haenke var. *acuminata* (Clarke) Sunita, has been proposed for *G. clarkei* Kusn. var. *acuminata*

(Clarke) Kusn. *G. prostrata* Haenke var. *acuminata* (Clarke) Sunita was distributed in Jammu & Kashmir, Himachal Pradesh and Uttar Pradesh.

23. **Agrawal, S. 1984.** "Studies on *Gentiana aquatica* L. and its allies (Gentianaceae)". *J. Econ. Taxon. Bot.* 5(2): 436–438.

    Abstract: After critical taxonomic and nomenclatural studies *Gentiana pseudoaquatica* Kusn. has been reduced as a variety of *Gentiana aquatica* L. and *Gentiana burkillii* H. Smith as a synonym of *G. pseudoaquatica* Kusn. [= *G. aquatica* L. var. *pseudoaquatica* (Kusn.) Sunita].

24. **Agrawal, S., Bhattacharyya, U.C. & Gupta, B.K. 1981.** "*A note on Gentiana harwanensis* (Gentianaceae)". *Indian J. Forest.* 4: 236–238.

25. **Ahamed, N. & Gupta, A.K. 2010.** "Analysis of flora of Baghpat district, Uttar Pradesh, India". *Indian J. Forest.* 33(3): 405–418.

    Abstract: The flora of Baghpat (U.P.) comprises 566 species belong to 371 genera distributed among 102 families of flowering plants. Poaceae (60 species), Fabaceae (41 species) are the largest families among monocotyledons and dicotyledons respectively. There are 39 families which are represented each by single species and single genus. The 11 families are represented by single genus but more than one species.

26. **Airi, S., Rawal, R.S., Dhar, U. & Purohit, A.N. 2000.** "Assessment of availability and habitat preference of *Jatamansi*– A critically endangered medicinal plant of West Himalaya". *Curr. Sci.* 79(10): 1467–1471.

    Abstract: *Nardostachys jatamansi* (D. Don) DC., a critically endangered rhizome-bearing medicinal plant, is restricted to specialized habitats in high altitudes of the Himalaya, ranging from 3000 to 5000 m asl. The plant is collected from natural habitats for local consumption and trade. The existing status of the species and variations in its performance in different habitats were studied in selected sites in Kumaun, west Himalaya. Dripping moss-laden rocks (frequency 40.7%, density 15.9 individual/m^2) and moist boulders (frequency 25.9% and density 16.8 individual/m^2) are the most preferred habitats of this plant. Generally, density and frequency had significant ($P<0.05$) positive relationship with altitude. The mean density in two contrasting slopes differed significantly ($P<0.05$), showing relatively higher density on west-facing slopes. Several biological and environmental features of the individual plants contributing towards wholesome below-ground biomass were identified. For example, among biological parameters, plant density ($P<0.01$), plant height ($P<0.01$) and above ground biomass ($P<0.01$) were positively correlated. So were soil nitrogen ($P<0.05$) and moisture content ($P<0.01$) with below ground biomass.

27. **Akash, Navneet & Bhandari, B.S. 2018.** "Tree diversity, stand structure and community composition in tropical forest of Rajaji Tiger Reserve, Northern India". *J. Appl. & Nat. Sci.* 10(3): 945–953.

    Abstract: In present study, we present data on tree diversity, stand structures and community composition in six sites of tropical forest in Rajaji tiger reserve, Northern India. The enumeration of 72 plots results a total of 19,050 individuals, 47 species, 42 genera, 25 families in which *Holoptelia integrifolea, Dalbergia sissoo, Shorea robusta,* *Cassia fistula* and *Trewia nudiflora* were the species which showed higher importance value index (IVI) in the study area. The stand density of the six sites ranges from 149.99-397.91 hac^{-1}where as the total basal area of trees ranges from 3.612-46.813 m^2/hac^{-1}. The Shannon diversity index ranged from 1.35 to 2.51, Simpson index ranged from 0.097-0.446, Margalef index ranged 2.584-4.9, The Evenness index ranged from 0.551-0.852 in the study area. Further the studied area has showed ample evidences from indices in supporting the higher floristic diversity and stand structure after providing the present area as a status of tiger reserve.

28. **Ali, S.J., Khan, Z.H. & Beg, M.J. 2008.** "Studies on species diversity and habitat relationships in Acanthaceae of Eastern Uttar Pradesh". *J. Econ. Taxon. Bot.* 32(3): 724–733.

Abstract: During this study on Acanthaceae, 42 species (belonging to 24 genera) were recorded from the area. Valid scientific names of these species have been given with important synonyms along with notes on distribution and habitats. Some species are widely distributed due to their high degree of tolerance limit against physical and biological environment, eg. *Andrographis paniculata, Rungia pectinata, Justicia adhatoda,* etc., while others, with low tolerance limits were found confined to special habitats, eg. *Hygrophila schulli, Hemigraphis hirta, Lepidagathis incurve* (swampy places, along streams and canals), *Elytraria acaulis, Indoneesiella echioides* (crevices of old walls), *Dicliptera verticillata, Dipteracanthus prostrates* (fruit orchad) and *Rostellularia quinqueangularis, R. diffusa, Rungia repens* (rice fields).

29. **Ambrish, K. & Srivastava, S.K. 2014.** "Taxonomic studies on the genus *Arnebia* Forssk. (Boraginaceae) in India". *Taiwania* 59(4): 315–325.

Abstract: The genus *Arnebia* Forssk. in India is taxonomically studied based on field surveys, collection of live specimens, consultation of herbarium and literature. The genus is represented in India by 10 taxa including 8 species and 2 varieties viz., *Arnebia bhattacharyyae* K. Ambrish & S.K. Srivast., *A. benthamii* (Wall. ex G. Don) I.N. Johnst., *A. euchroma* (Royle) I.M. Johnst., *A. guttata* Bunge, *A. hispidissima* (Sieber ex Lehm.) A. DC., *A. linearifolia* A. DC., *A. grifithii* Boiss., *A. nandadeviensis* K. Chandra Sek. & R.S. Rawal, *A. euchroma* var. *grandis* (Bornm.) Kazmi and *A. guttata* var. *thomsonii* (C.B. Clarke) Kazmi, distributed in Jammu & Kashmir, Himachal Pradesh and Uttarakhand in North-West Himalaya to Uttar Pradesh, Punjab and Rajasthan in India. Dichotomous keys to all the species in India along with taxonomic description, distribution, illustrations and images of most of the species including type and their economic importance are provided.

30. **Anderson, T. 1859.** "Notes on flora of Lucknow with catalogues of cultivated and the indigenous plants". *J. Asiat. Soc. Bengal,* N.S. 28(2): 89–120.

31. **Anonymous. 2010.** Uttarakhand Forest Statistics 2009-2010. Forest Department, Uttarakhand and Bishen Singh Mahendra Pal Singh, Dehra Dun.

32. **Ansari, A.A. 1984.** "Vegetation analysis of Madhulia forest, Gorakhpur– Emphasis to special habitats". *J. Econ. Taxon. Bot.* 5(4): 897–903.

Abstract: Madhulia forest with its diverse ecological habitats and presence of river, nalas and tals supports various types of plant communities. A large part of the forest

is occupied by distinct forest stands and a number of special habitats depict remarkable vegetational diversity.

33. **Ansari, A.A. 1986.** "Flora of Madhaulia forest, Gorakhpur (U.P.), Dicotyledons check list– I". *J. Econ. Taxon. Bot.* 8(2): 329–338.

Abstract: The paper enumerates 237 taxa belonging to dicotyledons following the classification of Bentham & Hooker. The systematic enumeration includes correct names, basionyms wherever required. Local names in inverted comma followed by field numbers in brackets. For collector's name read *Ansari.*

34. **Ansari, A.A. 1996.** "Flora of Madhaulia forest, Gorakhpur (U.P.) checklist– II". *J. Econ. Tax. Bot.* 20(1): 149–165.

Abstract: In the present paper 323 species belonging to 44 families of dicots and 167 species belongs to 22 families of monocots plants has been reported from Madhaulia forest, Gorakhpur, Uttar Pradesh.

35. **Ansari, A.A. 1997.** "Seasonal aspects of Asteraceous flora of Pauri Garhwal". *J. Econ. Taxon. Bot.* 21(3): 619–624.

Abstract: The present paper deals with the phonological studies of 50 species belonging to 31 genera of the family Asteraceae (Compositae) growing wild in pauri Garhwal. Maximum flowering is during August-September and maximum fruiting during September-October.

36. **Ansari, A.A. 2006.** *Flora and vegetation of Madhaulia forest (U.P.).* Oriental Enterprises, Dehradun. Pp. 152.

37. **Ansari, A.A. & Nand, Ghana. 1989.** "Phenological observations on some woody angiosperms of Pauri Garhwal". *Indian J. Forest.* 12(1): 21–24.

38. **Ansari, A.A. & Nand, Ghana. 1993.** "Flora of Experimental Botanic Garden, Nagdev, Pauri Garhwal". *Bull. Bot. Surv. India* 35(1-4): 77–86.

Abstract: The present paper deals with the angiospermic plants growing in the Experimental Botanic Garden, Nagdev, Pauri Garhwal. A total number of 256 species distributed over 215 genera and 66 families have been recorded and arranged according to the classification of Bentham & Hooker (1862-1883). For each taxon correct binomial with author's name, local name in inverted comma, habit, flower colour, flowering and fruiting period, collector's number, etc. have been given. For collector's name please read Ansari and Ghana Nand. A list of gymnosperms available in the garden is also appended.

39. **Ansari, A.A. & Nand, Ghana. 1993.** "Wild ornamentals of Pauri Garhwal". *Bull. Bot. Surv. India* 35(1-4): 128–130.

Abstract: The present paper deals with 35 number of wild plants having ornamental value have been noted, which can be introduced in the garden for their beautiful flowers, fruits, foliage, etc. The correct time of flowering and fruiting time was also noted. For each species correct binomial, basionym if any, family to which it belongs, local name if any in inverted comma, flower and fruit colour if interesting, flowering and fruiting period, etc. have been given in this enumeration.

40. **Ansari, A.A. & Nand, Ghana. 1996.** "Flora of Khirsu Protected Reserve, Pauri Garhwal– Checklist". *J. Econ. Taxon. Bot.* 20(1): 167–173.

Abstract: The paper enumerates 178 species comprising of 134 genera under 63 families collected from Khirsu Protected Area, Pauri Garhwal.

41. **Ansari, A.A. & Singh, S.K. 1979.** "Biological spectrum of the Madhulia forest of Gorakhpur". *Indian J. Forest.* 2(2): 153–157.

Abstract: Life forms of the vegetation and biological spectrum of the flora of Madhulia forest have been determined. The comparison with normal spectrum shows therophytic plant-climate, which is contradictory to the Raunkiaer's hypothesis.

42. **Ansari, A.A. & Tiwari, A.P. 2014.** "Phytodiversity of Ranipur Wildlife Sanctuary, Uttar Pradesh". *J. Econ. Taxon. Bot.* 37(1): 130–186.

Abstract: The present paper deals with the preliminary account of the phytodiversity of Ranipur Wildlife Sanctuary, Uttar Pradesh. The vegetation of the area is mixed-deciduous type. However, the floristic composition varies from place to place. In all four exploration tours were undertaken during 2010-2012, which resulted in collection of good number of herbarium specimens and field data. After critical studies, a total of 576 species under 395 genera belonging to 102 families are recorded. Out of these, 566 species belonging to 386 genera and 93 families are angiosperms and 10 species belonging to genera and 9 families are pteridophytes. The dicotyledons comprise of 445 species under 309 genera and 77 families, where as the monocotyledons consists of 121 species belonging to 77 genera and 16 familes.

43. **Ansari, A.A. & Tiwari, A.P. 2014.** "Floristic analysis of Ranipur Wildlife Sanctuary, Uttar Pradesh". *J. Non-Timber Forest Prod.* 21(1): 45–52.

Abstract: Extensive and intensive floristic survey of Ranipur Wildlife Sanctuary, Uttar Pradesh was undertaken during 2010-2012, which after critical studies revealed a total of 582 species under 389 genera belonging to 105 families. Out of these, 572 species belonging to 380 genera and 96 families are angiosperms and 10 species belonging to 9 genera and 9 families are pteridophytes.

44. **Ansari, A.A., Singh, S.K. & Dixit, S.N. 1987.** "Seasonal aspects of Asteraceous flora of Gorakhpur district". *J. Econ. Taxon. Bot* 9(2): 343–349.

Abstract: Phenological studies of 57 species belonging to 37 genera of the family Asteraceae (Compositae) growing wild in Gorakhpur district have been made. Plants growing in different seasons and under special habitats have been recorded. A list of the taxa flowering in various months of the year has been given. Correlation of the flowering periods with two major climatic factors viz. rainfall and temperature has been studied.

45. **Anthwal, S., Bhatt, A.B., Nautiyal, B.P. & Anthwal, A. 2008.** "Vegetation structure, niche width, niche overlap and types of competition in temperate grazing land of Garhwal Himalaya, India". *Environmentalist* 28(3): 261–273.

Abstract: Temperate grazing lands in Garhwal Himalaya are rich in herbaceous vegetation and extensively used for grazing by locally owned livestock. *Capillipedium parviflorum* is a frequently occurring and dominant grass species under Pine canopy in associate with several herbs. Beside, grazing and extensive fire, interactions among associated species is a determining factor of community structure. In this article the dominant diversity pattern of vegetation in temperate grazing land along two different altitudes and having different slope aspects is described. Interaction between dominant and co-dominant species with their niche appearance and niche overlap measurement was also observed and presented here. South and west facing slopes had maximum species and diversity values while east north facing slopes had higher species dominant. *Capillipedium parviflorum* and other grasses had maximum niche values and were dominant and co dominant species. Three types of interspecific interaction were observed between species and grasses were observed as succeeding species in all sites of different topographic conditions. Dominant diversity pattern along with resource partitioning and interspecific competition is discussed and presented here.

46. **Arya, M.P.S. 1995.** "Distribution pattern of Kharip season weeds in U.P. hills". *Indian J. Weed Sci.* 27: 56–62.

47. **Arya, S.C. 2002.** *Assessment of habitat diversity, distribution of vegetation and human dependence in Alpine meadows of Nanda Devi Biosphere Reserve, West Himalaya.* Ph.D. Thesis, Kumaun University, Nainital (unpublished).

48. **Aswal, B.S. & Mehrotra, B.N. 1983a.** "Nomenclatural notes on some flowering plants-I". *J. Econ. Taxon. Bot.* 4(3): 1027–1028.

49. **Aswal, B.S., Goel, A.K. & Mehrotra, B.N. 1988.** "An inventory of the family Asteraceae from Garhwal and Kumaon Himalayas". *J. Econ. Taxon. Bot.* 12(1): 1–37.

    Abstract: This inventory gives an account of the family Asteraceae (Compositae) from Garhwal and Kumaon Himalayas. In all 334 taxa belonging to 116 genera have been enumerated. Each taxon is provided with its correct name, important synonym(s), short description, abundance, flowering and fruiting period and district-wise distribution. Suggestions for thorough, intensive collections of the virgin or poorly explored areas, have been given. Plants used in the indigenous system of medicine have been indicated. Also the results of the plants screened for their biological activity have been provided.

50. **Atkinson, E.T. 1882.** *Flora of the Himalayas with special reference to Kumaon, Garhwal, Nepal and Tibet.* Govt. Press, Allahabad. (Repr. 1980, Cosmo Publ.).

51. **Atri, N.S. & Saini, S.S. 1986.** "Further contributions on the studies of North West Himalayan Russulaceae". *Geobios, New Rep.* 5: 100–105.

    Abstract: Thirty seven taxa of Russulaceae (25 of *Russula* Pers. and 12 of *Lactarius* Pers.) which are found associated with the broad-leaved, coniferous and mixed forests of North-western Himalayas are listed here. Of these, 12 taxa belonging to each genus are new records for India.

52. **Awasthi, A. & Joshi, S.P. 1998.** "Nutritive value of some plant species of Doon valley in different phonological stages". *Ann. Forest.* 6(2): 232–238.

    Abstract: Various plant species are consumed as fodder. The present work has been done to determine the nutritive status of some plant species of Dehra Dun. Various plant species at different phonological stages were collected and passed through various processes for analysing the percentage of nitrogen, phosphorus, calcium and potassium. Crude fibre percentage was also determined to find out the palatability of various plant species. The nutritive value of plant species depends upon its chemical composition and stage of growth. Present study revealed that protein and fibre value was increasing from vegetative to flowering stage and some of the plant species of Doon valley such as *Cynodon dactylon, Melilotus indica, Avena sativa, Cyperus rotundus, Phalaris minor* and *Trifolium alexandrium* were reported to be highly nutritious in all phonological stages.

53. **Awasthi, A., Uniyal, S.K. & Rawat, G.S. 2001.** "Forest management down the ages: A case study from district Uttarkashi, Uttaranchal". *Indian J. Forest.* 24(3): 388–394.

Abstract: Chronological survey of processes and events in the forest and land management in Uttarkshi district, Uttaranchal has been emphasized. The present status of forest in Uttarkashi is the result of past exploitation and management practices. The conflicts between forest managers and villagers shaped the ecology of mountains. Since past few decades need of people's participation and their traditional knowledge of managing forests has been felt to slow down the process of degradation in the Himalaya.

54. **Awasthi, A., Uniyal, S.K. & Rawat, G.S. 2003.** "Status and extraction patterns of *Jurinea dolomiaea* Boiss (Dhoop) in an alpine meadows of Kumaon Himalaya (Uttaranchal)". *Indian Forester* 129(5): 589–595.

Abstract: The status and distrubution of *Jurinea dolomiaea* Boiss. (Dhoop) in different habitats has been assessed using stratified random sampling. Belt transects of 20 × 2 m were laid to quantify the availability of Dhoop. Highest density (27,215 individualslha), frequency (86%) and biomass (1,687 kg/ha) were found in the undulating meadows and least in the rocky habitats, where the density, frequency and biomass were 3,125 individuals/ha, 26% and 193 kg/ha respectively. Patterns and processes of Dhoop extraction by the local people are discussed in the light of conservation implications.

55. **Babu, C.R. 1977.** *Herbaceous Flora of Dehra Dun.* Council of Scientific and Industrial Research (CSIR) Publ., New Delhi.

56. **Bachkheti, N.D. 1986.** "The Valley of Flowers". *Indian Forester* 112(7): 583–587.

Abstract: Valley of Flowers is situated in main valley of Alkananda and Dhauli Ganga, in the Zaskar ranges of the Garhwal Himalayas. The paper comprehensively deals with the various aspects of the most beautiful place on earth. The valley is full of numerous floweres during different months.

57. **Badola, R. 1998.** *Nanda Devi Biosphere Reserve: A study on socio-economic aspects for the sustainable development of dependent population.* Report, Wildlife Institute of India (WII), Dehra Dun.

58. **Badoni, A.K. 1989.** *Herbaceous Flora of Uttarkashi District.* Ph. D. Thesis, H.N.B. Garhwal University, Srinagar (unpublished).

59. **Baduni, N.P. & Sharma, C.M. 1996.** "Effect of aspect on the structure of some natural stands of *Quercus semecarpifolia* in Himalayan moist temperate forest". *Indian J. Forest.* 19(4): 335–341.

Abstract: The impact of aspect, altitude and slope have been observed on the moist temperate forest of *Quercus semecarpifolia* in garhwal Himalaya. In total four faces, namely North East, North West, South East and South West have been studied to understand the growth behavious of Q. *Semecarpifolia* with varying altitudes. The total basal cover was found highest (5733.48 $cm^2/100\ m^2$) on the North East facing slope. The Q. *Semecarpifolia* was found associated with *Rhododendron arboretum* as a main companion species on the all faces except South East.

60. **Baduni, N.P. & Sharma, C.M. 1999.** "Community structure and growing stock variation in *Quercus floribunda* forest on different aspects in Garhwal Himalaya". *Bangladesh J. Forest Sci.* 28(2): 82–93.

61. **Baduni, N.P. & Sharma, C.M. 2001.** "Population structure and community analysis on different aspects of Sal savannah forest type in outer Garhwal Himalaya". *Indian Forester* 127(9): 1001–1011.

Abstract: The population structure and community analysis of the Sal-Savanna forest of the Kalagarh Forest Division in the outer Himalaya were studied on four different aspects viz., North-East, North-West, South-East and South-West. The maximum density (500 tree/ha) and maximum total basal cover (32.98 m^2/ha) were observed on the SW and NE aspects respectively. The tree diversity range in these forests varied from 0.5029 (on NE aspect) to 1.366 (on SE aspect). The maximum dispersion of tree individuals were seen on SE aspect which has indicated a more stable community comparatively. Due to more biotic and abiotic inteference's, the population structure on other aspects has shown a degrading sustainability. The occurrence of grasses growth with sal undr these disturbed climatic condition and heavy biotic interference have represented this stage of retrogression in otherwise climax sal type and are responsible for the formation of Sal-Savanna forest type.

62. **Bagwari, H.K., Negi, G.C.S. & Todaria, N.P. 2010.** "Biomass production of forests in Rawanganga watershed in Garhwal Himalaya". *Indian J. Forest.* 33(1): 55–62.

Abstract: Three forest types were recognised in Rawanganga watershed, *Quercus glauca* dominated forest at lower altitudes (800-1200 m), *Pinus roxburghii* dominated forest at middle altitude (1200-1600 m) and mixed oak forest at higher altitudes (>1600 m). A total of 25 tree species were recorded in all the three types of forests, however, the maximum tree species were found in mixed Oak forest. Absence of some species, either in seedling or sapling or from both the layers suggested that despite of dominance of such species in canopy, regeneration was suppressed severely and may pose a threat to their survival in coming years. The biomass increment and carbon sequestration by these forest types was in order of *Quercus glauca* fores >mixed Oak forest> Pine forest.

63. **Bahadur, K.N. 1980.** "A note on the flowering of *Bambusa nutans*". *Indian Forester* 106(4): 314–316.

Abstract: Gregarious flowering of *Bambusa nutans* in 1980 is reported from Dehra Dun. Readers are requested to keep a watch in other areas of its occurrence. Apart from the irregular sporadic flowering, this bamboo seems to flower gregariously after every 35 years. There are at least 2 seperate flowering cycles involved, each of the same duration, the last having manifested in 1966.

64. **Bahadur, K.N. & Naithani, H.B. 1978.** "On a rare Himalayan Bamboo". *Indian J. Forest.* 1(1): 39–43.

Abstract: In 1894, Gamble described bamboo, *Arundinaria jaunsarensis* from Jaunsar in Tehri Garhwal. Earlier, it was introduced as seed into England, where in 1896, Freeman-Mitford described it as *A. anceps*. No flowering record of this species in India is available, but the data on its flowering in the U.K. suggests that it has a flowering cycle of 45=55 years. Examination of flowering material revealed that it is actually a C*himonobambusa*, hence a new combination, C. *jaunsarensis* (Gamble) Bahadur & Naithani, is made. Besides dealing with other taxonomical aspects, the flower-structure is reported for the first time, together with an illustration. It is a potential raw material for pulp and paper. The species is becoming rare gradually and needs protection.

65. **Bahuguna, Y.K. & Sood, O.P. 1987.** "Germination behaviour of *Prinsepia utilis* Royle– An important shrub for reclamation of wastelands in Himalayas". *Indian Forester* 113(5): 381–382.

Abstract: *Prinsepia utilis* Royle occur naturally in India in Himalayas (dry hill slopes and road sides in Garhwal and Chakrata hills) and in Khasi and Jaintia hills. Seed oil is used for cooking purposes and as an illuminant. The oil is also used in rheumatism and pains. The wood is used as fuel and occasionally for making walking stick. The seed of this species are very short lived. The steep fall in the germination capacity of the seed may be due to the oil contents and probably suggestive of recalcitrant behaviour.

66. **Bahuguna, Y.M., Sharma, J. & Gairola, S. 2011.** "Phytodiversity in the submergence area of the Srinagar Hydroelectric Power Project in Garhwal Himalaya, Uttarakhand, India". *Int. J. Environm. Sci.* 1(7): 1448–1458.

Abstract: The present study was conducted to assess the Phytodiversity in the submergence zone of the medium scale Srinagar Hydro-electric project, which is being constructed on river Alaknanda near Srinagar town of district Pauri Garhwal in Uttarakhand state of India. We recorded a total of 133 species belonging to 65 families and 113 genera. Of the 54 families, 26 were represented by single species, 12 by two species, 6 by three species and 10 with more than 3 species. Euphorbiaceae and Fabaceae were the dominant families with 9 species each, followed by Amaranthaceae (7), Lamiaceae (7), Malvaceae (7), Asteraceae (6) and Solanaceae (6). These plant species were used by the local villagers for variety of uses ranging from food, religious uses, perfume, medicinal, fodder, dye, household articles, agricultural implements, beverage, fuel, ornamental, narcotic, insecticide, etc.

67. **Bajpai, O., Srivastava, A.K., Kushwaha, A.K. & Chaudhary, L.B. 2014.** "Taxonomy of a monotypic genus *Indopiptadenia* (Leguminosae-Mimosoideae)". *Phytotaxa* 164(2): 61–78.

Abstract: *Indopiptadenia*, a monospecific genus with the species *I. oudhensis*, is confined to the Indo-Nepal border area in scattered populations along the Himalayan foothills between 156–908 m elevation. *I. oudhensis* has been little studied since its discovery in 1874. The taxonomy of the genus is reexamined here with extensive notes on diversity, distribution, phenology, ecology and conservation status based on exhaustive field survey and examination of herbarium specimens. A full description including

data on many new characters and encompassing all morphological variations is provided to better characterize the species so that its correct systematic position can be ascertained and provide the basis for proper conservation strategies. Placed in the tribe Mimoseae, the species shows more affinity towards the Newtonia group than the Piptadenia group. However, it differs from the former in having unarmed to armed stem, uni- or bijugate leaflets, absence of stemonozone and pods that dehisce generally by rupturing of the pod valves over the seed chambers to leave a persistent replum. The IUCN category Near Threatened (NT) is assigned to the taxon.

68. **Bajpai, O., Kushwaha, A.K., Srivastava, A.K., Pandey, J. & Choudhary, L.B. 2015.** "Phytosociological status of a monotypic genus *Indopiptadenia:* A near threatened tree from the Terai-Bhabar region of Central Himalaya". *Res. J. Forest.* 9(2): 35–47.

Abstract: A phytosociological assessment was done in Terai-Bhabar region of the central Himalaya to understand the current status of a monotypic genus *Indopiptadenia*. Identification of different forest communities within the region was also accomplished. Cluster analysis and PCA revealed five forest communities (i.e., sal miscellaneous forest, sal dominant forest, lowland miscellaneous forest, teak plantation and *Indopiptadenia* population) on the basis of their species composition. Out of these 5 communities, *Indopiptadenia* population attracted more attention due to its small and declining population. The unique habitat of this small population found chiefly on gravely-sandy soil along the water streams edges places it before the natural threats of floods and cutting of river banks. The lowest tree density (440.00 stem ha^{-1}) and basal cover (19.35 m^2 ha^1) values were exhibited by this plant community. This suggests that the population of *Indopiptadenia* is more exposed forest community in comparison to others and faces higher degree of anthropogenic pressures for their fodder and timber values.

69. **Balapure, K.M. 1959.** "Flora of New Forest, Dehra Dun with special reference to indigenous species". *Indian Forester* 85(6): 339–351.

Abstract: This paper gives an account of the indigenous flora of New forest, Dehra Dun. In all 56 families of flowering plants and 275 species have been dealt with. Ferns and mosses found in shady moist localities have been excluded. Bentham and Hooker;s system of classification has been followed in arranging the families. A short description of the plants and their period of flowering have been given. An attention has been drawn to a large number of exotic plants that are getting naturalised in the estate.

70. **Balapure, K.M. 1971.** "The grasses of Lucknow district". *Bull. Bot. Surv. India* 13(1&2): 64–78.

Abstract: This paper gives an account of the grasses of Lucknow district. About 65 genera and 130 species belonging to the 3 tribes of Panicoideae and 15 tribes of Pooideae are described. Of these 18 tribes the tribe Paniceae, Andropogoneae, Eragrosteae and Chlorideae are dominant in having 48, 31, 18 and 8 species respectively. Key to the tribes, sub-tribes, genera and species are given. Correct names, notes on habit and habitat, exact localities of occurrence, names of the collectors and field numbers are appended to every species enumerated.

71. **Balapure, K.M. 1983.** "A contribution to the vascular flora enroute to Rupkund (dist. Chamoli), Garhwal Himalaya, Uttar Pradesh". *J. Econ. Taxon. Bot.* 4(1): 201–214.

Abstract: An area enroute to Rupkund was botanically explored by the author during October-November, 1967. Notes on the vegetation and flora are provided. A list of about 131 species belonging to 47 families is given so that it will be useful to botanists, foresters, tourists and naturalists alike since no record of the plants is available.

72. **Balapure, K.M. 1985.** "A botanical expedition to Madh-Maheshwar (Garhwal Himalaya), Uttar Pradesh". *J. Econ. Taxon. Bot.* 7(2): 407–424.

Abstract: One of the Panch-Kedars, Madh-Maheshwar has not been hitherto botanically surveyed and there is no record of the published account of the flowering plant of this region. This is the first recird of the flowering plants of this area. In the present communication, 181 species belonging to 137 genera and 62 families of flowering plants have been recorded. Field notes are appended to each species. The altitude from which the plants were collected varied from 1310 m to 3414 m.

73. **Balapure, K.M. & Srivastava, G. 1964.** *The vegetation of Lucknow district. (U.P).* Lucknow.

74. **Baleshwar, Datt, B. & Husain, T. 2008.** "Type collections in the herbarium of National Botanical Research Institute, Lucknow (LWG)". *J. Econ. Taxon. Bot.* 32(3): 673–677.

Abstract: Seventy seven type collections preserved in herbarium of National Botanical Research Institute, Lucknow (LWG) have been brought to light to facilitate their access to the taxonomists. Of the 77 type collections, 56 specimens of 33 taxa belong to angiosperms, 18 specimens of 14 taxa of pteridophytes and 4 specimens of 4 taxa to Bryophytes.

75. **Ballabha, R., Tiwari, J.K. & Tiwari, P. 2014.** "Floristic diversity in the vicinity of Srinagar Hydroelectric Power Project in Alkananda valley of Garhwal Himalaya, India: Needs for conservation". *Int. J. Environm. Sci.* 5(3): 553–579.

Abstract: The present study provides comprehensive information on floristic diversity (angiosperms and gymnosperms), habitat wise distribution and management plan for conservation of higher plants in the vicinity of Srinagar hydroelectric power project in Alaknanda valley of Garhwal Himalaya, India. We recorded 526 plant species belonging to 372 genera and 94 families from the study area. Out of the documented species 329 were herbs, 74 shrubs, 73 trees and the rest 50 were climbers. Gymnosperms were represented by 2 species, 2 genera and 2 families, Dicotyledons by 432 species, 306 genera and 78 families whereas Monocotyledons by 92 species, 64 genera and 14 families. Fabaceae (50 species and 32 genera), Poaceae (49 species and 35 genera), Asteraceae (44 species and 33 genera), Lamiaceae (24 species and 19 genera), Euphorbiaceae (18 species and 7 genera), Malvaceae (18 species and 10 genera), Solanaceae (18 species and 10 genera), Cucurbitaceae (13 species and 10 genera), Amaranthaceae (12 species and 8 genera) and Cyperaceae (12 species and 6 genera) were the dominant families and showed 60% similarity with the dominant families of India. Among all the reported plant species, 231 were recorded in 3 or > 3 habitats and the remaining were restricted to 1 or 2 habitats only. The representation of species was maximum on agricultural fields/margins (267 species) followed by forest/forest edges (221 species), road/way sides (217 species), whereas minimum (30 species) on river/stream banks. The construction of hydroelectric power project may lead to reduction of plant diversity from the area. Furthermore, other anthropogenic activities like construction of hill roads, forest fire, overgrazing, lopping of trees for fodder and fuel-wood, removal of leaf and wood litter from the forest floor are also affecting the plant diversity in the area. A management plan for conservation of plant species in the vicinity of hydroelectric power project area is also suggested. The scientific information obtained from the present study will strengthen the data base and will be helpful in predicting possible changes in the ecosystem properties and forest composition in near future.

76. **Balodi, B. 1993.** Expedition to Nanda Devi· Floristic analysis. In: *Scientific and Ecological Expedition to Nanda Devi.* Pp. 86–95 Report, Army Head Quarters, New Delhi.

77. **Balodi, B. 1995.** Studies on the floristics of Pithoragarh district in N.W. Himalaya with particular reference to rare and endangered species and their conservation. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.,* Addl. Ser.] 5: 273–283. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: In the present study three new species viz., *Eulophia ucbii* Malhotra & Balodi, *Corallorhiza anendae* Malhotra & Balodi and *Eria excavate* Balodi & Malhotra and one new variety *Bulbophyllum reptans* var. *acuta* Malhotra & Balodi have been discovered from Pithoragarh distrct. Three new taxa for India and several new records from Western Himalaya and Kumaon have also been recorded from the area. Some interesting plant species from the district which form a new record after a lapse of 50 or more years.

78. **Balodi, B. & Hajra, P.K. 2002.** Nanda Devi Biosphere Reserve. In: Singh, N.P. & Singh, K.P. (Eds.), *Floristic Diversity and Conservation Strategies in India 5 (in situ and ex situ Conservation)*. Botanical Survey of India, Calcutta. Pp. 2645–2670.

79. **Balodi, B. & Kumar, S. 2002.** "Phytodiversity of Govind Wildlife Sanctuary, Uttaranchal, with special reference to ethnomedicinal information". *Phytotaxonomy* 2: 100–105.

Abstract: Govind Wildlife Sanctuary is a protected area of Uttarkashi district in Uttaranchal state. The sanctuary is rich in floristic diversity with more than 1100 species distributed from subtropical to alpine regions (1300–6323 m). The unique geographical position, topography and climate ofl this region have contributed significantly to rich diversity in flora, which represents all major forest types of hilly terrain. The dominant floristic components include species of *Ficus*, *Quercus*, *Rhododendron*, *Rosa*, *Rubus*, *Berberis* and *Cotoneaster* and *Celtis australis* L., *Grewia optiva* Drumm. ex Burr., *Mallotus philippensis* (Lam.) Muell.-Arg., *Aesculus indica* (Colebr. ex Cambess.) Hook., *Prunus cornuta* (Wall. ex Royle) Steud., besides a number of coniferous species and herbaceous plant species. The important medicinal plants include species of *Aconitum*. *Nardostachys grandiflora* DC., *Podophyllum hexandrum* Wall. ex Royle, *Picrorhiza scrophulariflora* Penn., *Arnebia benthamii* (Wall. ex G. Don) Johns., *Taxus wallichiana* Zucc., etc. to name a few. The other important plant species with lesser known ethnomedicinal uses in this region are also dealt with.

80. **Balodi, B. & Kumar, S. 2002.** "Altitudinal distribution and association of *Betula utilis* D. Don in Western Himalaya". *Phytotaxonomy* 2: 106–107.

Abstract: *Betula utilis* D. Don (Bhojpatra) is a well known tree since time immemorial. In Western Himalaya, it is generally said to form the tree line above 3300 m, which sometimes is not the case. Extensive field surveys in the region have revealed that *Betula utilis* occurs even at lower altitudes around 2400 m in association with species like *Prunus cornuta*, *Syringa emodi*, *Pinus wallichiana*, etc. At certain places, *Pinus wallichiana* replaces *Betula utilis* to form the tree line. This paper deals with different associations and altitudes inhabiting *Betula utilis* besides the economical aspects of this sacred tree.

81. **Balodi, B. & Rao, R.R 1991.** "The genus *Trigonella* L. (Fabaceae) in North-West Himalaya". *J. Econ. Taxon. Bot.* 15(1): 185–194.

Abstract: Taxonomy and distribution of the genus *Trigonella* L. in North-West Himalaya is dealth here. 12 taxa including one new pecies, one new variety and one new record for India are treated with keys, descriptions and illustrations. Few species are clearly endangered calling attention of conservationists. Economic importance of the group is also highlighted.

82. **Bamola, B.K. 1993.** *Lignosae Flora of Uttarkashi District.* Ph.D. Thesis, H.N.B. Garhwal University, Srinagar. (unpublished).

83. **Bankoti, N.S. 1990.** *Woody vegetation along elevational gradient (2000-3600 m) of upper Pindari catchment (Kumaun Himalaya).* Ph. D. Thesis, Kumaun University, Nainital (unpublished).

84. **Bankoti, N.S., Rawat, R.S., Samant, S.S. & Pangtey, Y.P.S. 1992.** "Forest vegetation of inner hill ranges in Kumaun, Central Himalaya". *Trop. Ecol.* 33: 41–53.

85. **Bano, M., Ahmed, B. & Dhasmana, R. 2017.** "Ecological status and ethno-medicinal studies on plant resources of Rajaji National Park, Uttarakhand, India". *Int. J. Bot. Stud.* 2(6): 209–215.

Abstract: The present communication relates to the status and ethno-medicinal knowledge of the flora of world famous Rajaji National Park in the state of Uttarakhand (India). The paper describes local/traditional uses of the 135 medicinal flora representing 63 families, in which 45 species were trees, 58 were herbs, 24 were shrubs and 8 were climbers. Amongst these families, Poaceae was dominant (11 plant species) in having medicinal importance, followed by Caesalpiniaceae, Apocynaceae and Moraceae with 6 species each. Various parts, such as: whole plant (35), roots (24), fruits (23), stem (4), leaves (41), barks (23), rhizome (4), bulbs (2), buds (3), seeds (12), flowers (7), tuber (1) and bulbils (1) were used in different ailments. Of the 135 medicinal plants, 18 species were reported to be threatened, endangered or rare. These identified plants need conservation and protection.

86. **Bano, M., Ahmed, B., Urfan, M. & Ansari, M. 2017.** "Ecological studies on some herbs and shrubs of Paniyali range of Kotdwara region, Uttarakhand, India". *Int. J. Bot. Stud.* 2(6): 200–204.

Abstract: The aim of our present investigation was to provide basic information about floristic distribution and species diversity of Paniyali range located in Kotdwara region

in Uttarakhand. In this region the climatic conditions favour the existence of a large number of plant species. Phytosociological data viz., plant species composition, density, frequency, dominance, IVI and FIV was determined. A total of 20 plant species belonging to13 families were encountered of which the maximum IVI was of *Sida rhombifolia* (26.6), followed by *Cassia occidentalis* (26.08). Apocynaceae and Malvaceae were the dominant families in the forest.

87. **Bargali, K., Usman, S. & Joshi, M. 1998.** "Effect of forest covers on certain site and soil characteristics in Kumaon Himalaya". *Indian J. Forest.* 21(3): 224–227.

Abstract: Site and soil characteristics under tilonj oak (*Quercus floribunda* Lindl.), banj oak (*Q. leucotrichophora* A. Camus), deodar (*Cedrus deodara* Loud.) and chir pine (*Pinus roxburghii* Sarg.) in Kumaon Himalaya were determined. Amongst these stands fine soil particles, porosity, water holding capacity, soil moisture, total nitrogen and organic carbon were highest under tilonj oak followed by banj oak then in deodar and lowest in chir pine forest. While, soil bulk density and temperature showed a reverse pattern. Heaviest litter fall occurred in deodar forest followed by banj oak and lowest in tilonj oak forest. Conifer forest litter had high C:N ratio than oak forest litter. Thus, oak forest had better soil conditions than the conifer forests.

88. **Bargali, K., Bisht, P., Khan, A. & Rawat, Y.S. 2013.** "Diversity and regeneration status of tree species at Nainital Catchment, Uttarakhand, India". *Int. J. Biodiv. & Conserv.* 5(5): 270–280.

Abstract: The existence of a species in a forest community largely depends on its ability to regenerate under varied environmental conditions. In the present study, effect of biotic disturbance was assessed and analysed on diversity and regeneration of pre-dominant tree species of oak forests. For this, two adjacent sites were selected in mixed oak forest zone (2100 m asl), namely, undisturbed open area (inside zoo) and moderately disturbed open area (out side zoo). Phytosociological analysis of tree and shrub layer vegetation was done and density, diversity index, Importance Value Index etc were determined for both the sites. Regeneration status of tree species was analysed by developing population structures. Species richness (tree as well as shrub) was high in disturbed site (11 to 20) as compared to protected site (9 to 11), and in both the sites the species richness was maximum at hill slope. Among the tree species *Quercus floribunda* was dominant with highest value of IVI in protected site. Contrary to this, *Quercus lecotrichophora* was dominant in disturbed site at hill base and hill slope, while *Q. floribunda* was dominant at hill top site. Tree density ranged from 780 to 1000 trees ha^{-1} in protected site and from 260 to 780 trees ha^{-1} in disturbed site. In both the sites, *Q. leucotrichophora* and *Q. floribunda* have higher proportion of individual in younger girth classes (seedlings and saplings), indicating expanding type of population structure. However, conversion into higher girth classes was more prominent at protected site as compared to disturbed site. Thus, it can be concluded that oak species of Kumaun Himalayan region have ability to regenerate when anthropogenic pressures are negligible.

89. **Bargali, S.S., Tewari, J.C., Rawat, Y.S. & Singh, S.P. 1987.** Woody vegetation in a high altitude elevation Blue Pine-mixed Oak forest of Kumaun Himalaya. In: Pangtey,

Y.P.S. & Johi, S.C. (Eds.), *Western Himalaya: Environment, Problem and Development.* Gyanodaya Prakashan, Nainital. Pp. 121–155.

90. **Bartwal, B.S. 1991.** *Forest Flora of Pauri Garhwal.* Ph. D. Thesis. H.N.B. Garhwal University, Srinagar. (unpublished).

91. **Basotra, R., Chauhan, S. & Todaria, N.P. 2005.** "Allelopathic effects of medicinal plants on food crops in Garhwal Himalaya". *J. Sustain. Agric.* 26(3): 43–56.

Abstract: An aqueous leaf and root/tuber extracts of three important medicinal plant species (e.g., *Bergenia ciliata*, *Hedychium spicatum* and *Potentilla fulgens*) were tested for their allelopathic effects on germination, radicle and plumule elongation of *Amaranthus caudatus*, *Eleusine coracana*, *Fagopyrum esculantum*, *Phaseolus mungoo*, *Phaseolus vulgaris* and *Triticum aestivum*. The results revealed that: the allelopathic effects increased with increasing concentration of leachats from 2%, 5% to 10%. The susceptible crops were *Amaranthus caudatus* and *Phaseolus mungoo* whose germination, redicle and plumule growth were reduced significantly under aqueous extracts of all three medicinal species. The results suggested that all the three species can be grown satisfactorily under traditional agriculture systems of subtropical-sub temperate region if whole plants of these medicinal species are harvested from the agricultural fields and nothing is left in the fields for allelopathic influence. Domesticated cultivation of medicinal plants is clearly a sustainable alternative in order to preserve this wild wealth and increase the farm income of local farmers.

92. **Bennet, S.S.R. & Chandra, S. 1982.** "A new combination in *Oxygraphis* Bunge (Ranunculaceae)". *Indian Forester* 108(5): 374.

Abstract: The correct name of *Oxygraphis polypetala* Hook.f. & Thoms. is *Oxygraphis endlicheri* (Walp.) Bennet & Chandra.

93. **Bhadula, S.K., Singh, A., Lata, H. & Kuniyal, C.P. 2000.** Distribution pattern, population diversity and propagation of some high altitude medicinal herbs from Garhwal Himalaya: Problems and prospects for conservation. In: Pangtey, Y.P.S. (Ed.), *High Altitudes of the Himalaya* 2: 389–413. Gyanodaya Prakashan, Nainital.

94. **Bhadula, S.K., Singh, A., Lata, H., Kuniyal, C.P. & Purohit, A.N. 1996.** "Genetic resources of *Podophyllum hexandrum* Royle, an endangered medicinal species from Garhwal Himalaya, India". *Pl. Genet. Resources Newsletter* (No. 106) 26–29.

Abstract: *Podophyllum hexandrum* Royle is an herbaceous and rhizomatous species of great medicinal importance that hs endangered status in India. It is distributed in very restricted lockets in the Himalayan zone at altitudes ranging from 2000 to 4000 m asl. Several lignans have been isolated from its rhizomes, the most important being podophyllotoxin which has cytotoxic and antitumor properties and has been used in the treatment of certain foms of cancer. In the recnt past, the frequency of this species in nature has declined considerably because of expoitation to meet the ever-increasing demand of pharmaceutical companies. In the natural habitat, seed germination and seedling establishment are very poor and propagation is mostly through rhizomes. Because the species is already endangered, and exploitation of its underground parts continues to exceed the rate of natural regeneration, it needs immediate attention for conservation. Studies of its population biology and genetic diversity are important

for successful development of conservation strategies. This paper describes the characteristics of various population of *P. hexandrum* collected from Garhwal Himalaya and present future conservation strategies for this important species.

95. **Bhandari, B.S. 2003.** "Blue Pine *(Pinus wallichiana)* forest stands of Garhwal Himalaya: Composition, population structure and diversity". *J. Trop. Forest Sci.* 15(1): 26–36.

96. **Bhandari, B.S. & Rawat, D.S. 2015.** "Diversity, life-forms and biological spectrum under Chir Pine (*Pinus roxburghii*) ecosystem of Garhwal Himalaya". *Phytotaxonomy* 15: 96–103.

    Abstract: The communication deals with the study of floristic diversity, life-form organisation and biological spectrum to decipher the phytoclimate under Chir Pine (*Pinus roxburghii*) forests of Garhwal Himalaya. High richness and diversity of grasses, sedges, legumes and other herbaceous species is attributed to the needle shaped Chir Pine leaves which facilitated more isolation and resulted in the formation of relatively open herb layer. Biological spectrum revealed the Phanero-thero phytoclimate. Therophytes were significantly higher than the normal spectrum partly due to xeric climate under Chir Pine and largely to the magnitude of influences of man and animals on the habitat including fire, grazing and other anthropogenic factors like removal of herbage, etc.

97. **Bhandari, B.S., Mehta, J.P. & Tiwari, S.C. 1995.** "Vegetation structure under different management regimes in a grazing land at Srinagar (Garhwal)". *J. Hill. Res.* 8(1): 39–46.

98. **Bhandari, B.S., Nautiyal, D.C. & Gaur, R.D. 1999.** "Structural attributes and productivity potential of an alpine pasture of Garhwal Himalaya". *J. Indian Bot. Soc.* 78(3-4): 321–329.

    Abstract: The present communication attempts to provide information on the diversity and productivity status of alpine meadows of Kuari-complex in Garhwal Himalaya. Vegettion during the study period comprised of annual or perennial species of grasses, sedges, legumes and non-legume forbs. Climate changes were found to induce many structural changes in these high altitude communities. Only a few species were recorded throughout the study period indicating the wide ecological amplitude of these species. Total species diversity ranged from 2.39 to 4.63 which is higher than any other high altitude Himalayan pasture. Major part of the biomass was contributed by a relatively few number of species, however, during peak growing month a relatively large number of species contributed significantly to the totl herbage. Aboveground-belowground ratio ranged from 1:1.31 to 1: 5.48. Aboveground net primary productivity (ANP) was 880.00, 629.88 and 1541.00 $gm^{-2}y^{-1}$ and net accumulation in dry matter was366.5, 258.8 and 544.0 $gm^{-2}y^{-1}$, on the investigated sites I, II and III, respectively.

99. **Bhandari, B.S., Mehta, J.P., Nautiyal, B.P. & Tiwari, S.C. 1997.** "Structure of a Chir Pine *(Pinus roxburghii* Sarg.) community along an altitudinal gradient in Garhwal Himalayas". *Int. J. Ecol. & Environm. Sci.* 23(1): 67–74.

100. **Bhandari, B.S., Thakur, U., Verma, S., Riaz, T. & Painuli, R.M. (2014). 2015.** "Floristic diversity and economic importance of Chir Pine (*Pinus roxburghii*) ecosystems: A case study of Srinagar valley of Garhwal Himalaya". *Phytotaxonomy* 14: 25–43.

Abstract: Chir Pine (*Pinus roxburghii*) forests are among the most neglected ecosystems of Uttarakhand Himalaya which experience recurrent forest fires every one to two years. These ecosystems are often blamed for the ecosystem degradation and biodiversity loss merely due to poor scientific understanding. Therefore, the present study was undertaken to bring forth the scientific facts associated with Chir Pine forests and grazing lands. Efforts have also been made to incorporate the ethno-economic uses of the plants based on available literature as well as through personal interactions with inhabitants. The study reveals that, these ecosystems are rich repository of biodiversity supporting the backbone of village ecosystem in many ways. Floristically, Chir Pine ecosystem harbours a great ground diversity on account of needle shaped leaves permitting greater isolation to the undercanopy environment, resulting into luxuriant herbaceous diversity. Natives depend heavily on these forests to cater their demand of fodder, fuel, timber, etc. Moreover, ground vegetation is harvested twice or thrice, particularly during and after rainy season in order to collect fodder for livestock for the period of scarcity.

101. **Bhandari, P.K., Thakur, J., Sharma, S. & Uniyal, P.L. 2018.** "Orchid diversity in Basukedar region (Rudraprayag district) of Uttarakhand". *J. Orchid Soc. India* 32: 73–79.

Abstract: Uttarakhand harbours 73 genera and 231 species of orchids out of which 54% are terrestrial, 41% epiphytic and 5% are saprophytic. Extrinsic rarity in orchids is a reflection of anthropogenic threatening processes which directly limit or reduce the distribution and abundance of species, such as collection of wild orchids or land clearance. Habitat protection could be one of the most important in situ conservation strategies for orchids. Microclimatic conditions play an important role in the establishment and distribution of orchid species. In the present study, an extensive field survey was carried out from the lower catchment area of Mandakini river (tropical forest) up to the upper sacred forest of Khombherav, in Garhwal division. A total 17 genera with 19 species were recorded. Majority of orchids were found epiphytic followed by terrestrial distributed between 1000-2600 m. Species of *Dendrobium* and *Oberonia* were found to be dominant. *Coelogyne cristata, Pholidota articulata* and *Satyrium nepalense* were found to be used by local people as a medicine.

102. **Bharadwaja, R.C., Basu Chaudhary, K.C. & Sinha, S. 1956.** "The grasses of Agra district". *Agra Univ. J. Res. (Sci.)* 5: 285–320.

103. **Bhargava, K.S. 1959.** "Unusual and supplementary food plants of Kumaon". *J. Bombay Nat. Hist. Soc.* 56(1): 26–31.

Abstract: In the present paper data has been collected regarding the wild edible plants of Kumaon region and to study the food value of different products consumed by the local population. This information may help in adding variety to the monotonous diet and publicising the hitherto unknown source of supplementary food to many visitors to this region.

104. **Bhargava, K.S. & Gupta, R.K. 1958.** "Seasonal material for a flora of Nainital". *Agra Univ. J. Res. (Sci.)* 7: 1–48.

105. **Bharti, R.R., Adhikari, B.S. & Rawat, G.S. (2011) 2012.** "Assessing vegetation

changes in timberline ecotone of Nanda Devi National Park, Uttarakhand". *Int. J. Appl. Earth Observ. & Geoinf.* 18: 472–479.

Abstract: Changes in the timberline ecotone vegetation of Nanda Devi National Park (NDNP) was studied over a period of 30 years (1980–2010). Our study based on remote sensing analysis of Landsat MSS and TM images suggests no geographical shift in the upper limit of timberline, while the subalpine forest's canopy has increased substantially. Decrease in heterogeneous reflectance pattern near upper boundary of timberline ecotone (above 3600 m asl) suggest more homogenous growth at this elevation. Though the scale of the study is not sufficient to detect minor changes our objective here is to know if the timberline vegetation of NDNP has gone under rapid change in last three decades. Two different methods post classification comparison and vegetation index differencing, used in this study have widely been used for vegetation change detection but very few studies have reported the performance of these methods for highly rugged terrain. Our approach in this study is to test the applicability of these methods in the specific environment of western Himalaya. Given the fact that the findings of the study could be the result of incorporation of various methodological errors we analyzed the descriptive statistics (mean and standard deviation) of vegetation index to interpret the nature of change.

106. **Bhat, J.A., Kumar, M., Negi, A.K. & Todaria, N.P. 2012.** "*Acacia dealbata* Link. (Silver Wattle), an invasive species growing in high altitudes of the Himalaya". *Curr. Sci.* 103(2): 130.

107. **Bhat, J.A., Kumar, M., Negi, A.K. & Todaria, N.P. 2013.** "'Informants' consensus on ethnomedicinal plants in Kedarnath Wildlife Sanctuary of Indian Himalayas". *J. Med. Pl. Res.* 7(4): 148–154.

Abstract: The present study was carried out in the protected area of Greater Himalayas, Uttarakhand, India. The study was carried out to understand the consensus on medicinal plants by inhabitants of Kedarnath Wildlife Sanctuary. The study documented 21 plant species that are used medicinally in 17 ailment categories. Out of 21 plant species, 12 species were reported for a single ailment separately and 8 species were reported by informants for more than one ailment. The consensus of informants for the roots and rhizomes were the most frequently used plant parts (68%). The plants which are under rare list in IUCN Red List category observed in the study area are *Picrorhiza kurrooa, Aconitium heterophyllum* and *Podophyllum hexandrum*. The Consensus index factor (Fic) was found to be higher in the Haematological illness category (1.00) followed by Dermatological and Ophthalmological category which was (0.98).

108. **Bhatnagar, A. 2019.** "Altitudinal variation in the volatile constituents of *Cymbopogon flexuosus* from Uttarakhand region of Himalaya". *J. Appl. & Nat. Sci.* 11(2): 263–266.

Abstract: The essential oils of *Cymbopogon flexuosus* (lemon grass) of the family Poaceae collected from different altitudes of the Uttarakhand region of Himalaya were subjected to detailed GC/MS analysis in order to determine the variation of concentration in their constituents. The GC/MS analysis led to the identification of 29

constituents forming 90.62 to 93.58% of their total oil content. The major constituents were citral, geraniol, citronellol, citranellal, linalool, borneol, ß-myrcene limonene, ß-caryophyllene, camphene, y-cadinene, "-terpineol, neryl acetate and heptenone. Plants collected from 450 m altitude afforded citral (74.58 %) [a isomeric mixture of geranial and nearl] as a major constituents whereas only a less percentage of citral (64.21%, 68.29%) was found in the plants collected from two other altitudes i.e 250m and 1000m respectively. The geraniol, camphene and neryl acetate were obtained in a high concentration form the plants collected at 250 m altitude but in the plant from two other altitudes, it was found only in less proportion. Similarly, y-cadinene, "-terpineol and camphene were the major constituents of plants at 1000m altitude but in other plants it was detected in very low concentration. Since, the concentration of plant constituents affected by altitude and season, medicinal properties of such plants and their use in biological application would vary accordingly.

109. **Bhatnagar, S., Sachan, S.N. & Sharma, N. 2011.** "Biodeterioration of the historical monuments of Doon valley with special reference to angiosperm diversity". *Indian J. Forest.* 34(2): 191–196.

Abstract: Angiosperms are one of the most important biodeteriogens that grow on old buildings of historical and religious importance and cause biophysical and biochemical decay. During these study angiosperms caused biodeterioration to the historical monuments of Doon valley was studied. This study was conducted on two monuments of Doon valley, i.e. Darbar Sahib and Tapkeshwar temple. The study was conducted in various seasons i.e. rainy, winter and summer. A total number of twenty-four angiosperms were collected from Darbar Sahib and thirty-six from Tapkeshwar temple. Maximum number of genera was collected during rainy season from both the monuments in which genera of Asteraceae, Scrophulariaceae and Poaceae were more common.

110. **Bhatnagar, V.P., Kumar, Anil & Srivastava, J.N. 2004.** "Phytodiversity in semiprotected riverbanks of Agra". *Bull. Bot. Surv. India* 46(1-4): 191–195.

Abstract: Riverbank ecosystem presents special habitat features of sloping topography, periodic inundation resulting in the temporary submergence of the vegetation which also faces the erosive forces of flood waters. During the summer months, it is subjected to intense drought conditions. Under such unstable and challenging conditions certain plant species colonize the riverbanks and form plant communities. After raining season with the receding of flood waters the vegetation appears in the form of characteristic belts which are quite distinct due to their shape, nmber and continuity along the Yamuna riverine slopes. The plant species inhabiting the riverbanks are certain wetlands winter annuals with a very short life span. The seed sock of these species is readily available on the bank and when the river comes in spate, the seeds are disseminated through the water currents.

111. **Bhatt, A., Rawal, R.S. & Dhar, U. 2006.** "Ecological features of a critically rare medicinal plant, *Swertia chirayita* in Himalaya". *Pl. Sp. Biol.* 21: 49–52.

112. **Bhatt, L.D., Giri, L., Rawal, R.S. & Chandra Sekar, K. 2010.** Diversity, distribution and economic potential of genus *Habenaria* (Family Orchidaceae) in Indian Himalayan

region. In: Tiwari, L.M. & *al*. (Eds.), *Biodiversity Potential of the Himalaya*. Gyanodaya Prakashan, Nainital. Pp. 351–362.

113. **Bhatt, V., Purohit, V.K. & Negi, V. 2010.** "Multipurpose tree species of Western Himalaya with an agroforestry prospective for rural needs". *J. American Sci.* 6(1): 73–80.

114. **Bhatt, V.P., Kumar, M., Rajwar, G.S. & Dhaulakhandi, M. 2004.** "Community structure and diversity of a moist mixed temperate forest of Notha-Chaurikhal of Garhwal Himalaya". *Ann. Forest.* 12(1): 81–86.

Abstract: The present study deals with a quantitative analysis of the vegetation on elevations ranging from 1700-2300 m asl in Pauri district of Garhwal Himalaya. A total of four sites were selected for the study. Among all the sites, *Quercus leucotrichophora* was found distributed throughout. The values of density and basal cover for different species ranged from 10 to 490 plants ha^{-1} and 0.36 to 126.48 m^2ha^{-1} on different sites. Most of the species on different sites were contiguously distributed whereas, regular distribution of species was observed on sites I and II. The values of CD and H ranged from 0.2439 to 0.3891 and 1.4470 to 2.2745 respectively.

115. **Bhattacharyya, B. & Sur, P.R. 1993.** "Genus *Lolium* in India". *J. Econ. Taxon. Bot.* 17(1): 37–41.

Abstract: A revision of the genus *Lolium* Linn. in India is presented here. There are 7 species distributed in India. Taxonomic characters, geographical distribution and a key is given. *L. remotum* Schrank var. *aristatum* (Doell) Aschers is recorded new in flora of India from Himachal Pradesh and Uttar Pradesh.

116. **Bhattacharyya, U.C. 1963.** "A contribution to the flora of Mirzapur– I. Some new records for the district and for the Upper Gangetic Plain". *Bull. Bot. Surv. India* 5(1): 59–62.

Abstract: *Buettneria herbacea* Roxb. (Sterculiaceae), *Crotalaria ramisissima* Roxb. (Leguminosae), *Hardwickia binata* Roxb. (Leguminosae), *Plectranthus mollis* (Ait.) Spreng. (Labiatae), *Leucas clarkei* Hook.f. (Labiatae), *Cyanotis fasciculata* Schult.f. (Commelinaceae) and *Eriocaulon setaceum* L. (Eriocaulaceae) are described here as new records for the Upper Gangetic plain. *Rauvolfia tetraphylla* L. (Apocynaceae) and *Plantago pumila* Willd. (Plantaginaceae) are also recorded for the first time from Mizrapur district.

117. **Bhattacharyya, U.C. 1964.** "A contribution to the flora of Mirzapur– II". *Bull. Bot. Surv. India* 6(2-4): 191–210.

Abstract: The paper gives an account of collection of plant specimens from the Mirzapur district in south-eastern Uttar Pradesh. The collection from the Vindhyan plateau as well as from the plains and southern hilly areas of the district yielded about 800 collection Nos. of which 460 species are incorporated in this list, including more than 40 species of grasses and a few interesting pteridophytes. The paper, in addition, gives an account of the vegetational pattern of the district in relation to topography. Some of the common and interesting plants, showing characteristics concentrations in different areas of the district, have also been pointed out. A general account of cultivation, common road-side plants, parasitic members and aquatic vegetation is

given in brief. *Crotalaria quinquefolia* Linn., *Hibiscus beddomei* Rakshit et Kundu and *Habenaria graveolens* Duthie ae given here as new records for the Upper Gangetic plain and *Aristolochia indica* Linn., *Passiflora foetida* Linn. and *Acanthospermum hispidum* DC. are reported as new for the district.

118. **Bhattacharyya, U.C. & Goel, A.K. 1982a.** Some ecological aspects of flora and vegetation of Tehri Dam and some rare plants in Garhwal Himalayas. Report- Booklet published by the Botanical Survey of India, Howrah.

119. **Bhattacharyya, U.C. & Malhotra, C.L. 1964.** "Botanical exploration in Hamirpur district (U.P.) with special reference to Mahoba aquatics". *Bull. Bot. Surv. India* 6(1): 23–41.

Abstract: The paper includes an account of the vegetationof the Hamirpur district in South Uttar Pradesh as observed by the authors during three seasonal visits during 1961–1962. The district has a large number of pinturesque artificial lakes and water resorvoirs and the aquatic flora has been given particular attention. The information gathered in this connection has been summarised in a table. The paper also includes an enumeration of more than 400 species of flowering plants and ferns which were gathered during the three collection tours.

120. **Bhattacharyya, U.C & Malhotra, C.L. 1982.** A botanical exploration en-route Roopkund lake (North-East Garhwal). In: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalaya.* Puja Publishers, New Delhi. Pp. 161–174.

121. **Bhattacharyya, U.C., Arora, C.M. & Malhotra, C.L. 1982.** The danger of vanishing orchid species in North-West Himalaya. In: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalayas.* Puja Publ., New Delhi. Pp. 249–255.

122. **Bhattacharyya, U.C., Singh, N.B. & Goel, A.K. 1981.** "Ecological adaptations of *Sedum sinuatum* Royle ex Edgew. (Crassulaceae) in N.W. Himalaya". *Indian J. Forest.* 4(3): 256–257.

Abstract: The present paper deals with some observations on ecological adaptations and range of habitats of *Sedum sinuatum* Royle ex Edgew. Its association with other plants and ten hosts with distribution in the N.W. Himalaya have been studied. The account is provided with a plate and a table.

123. **Bijalwan, R., Vats, M. & Joshi, S.P. 2013.** "Distribution of plant species in different growing periods of an alpine meadow of Garhwal Himalaya". *Indian J. Forest.* 36(2): 295-299.

Abstract: The present study describes the vegetation distribution changes in different growing periods of an akpine meadow of Garhwal Himalaya. The alpine meadow experiences a short growing season of six months. The density, frequency and abundance/frequency ratio were calculated for the plant species. Peak growing period recorded the maximum number of plant species, the plant species in this period were also found to have higher frequency and density in this period. Highest frequency percentage and density was recorded for *Ranunculus hirtellus* in post snow melt period. Peak growing period recorded the lowest frequency percentage for *Jurinea dolomiaea* and four other plant species and lowest density for *Anemone polyanthes*.

124. **Bir, S.S. & Saggoo, M.I.S. 1982.** Cytological studies on the family Labiatae from Garhwal Himalaya. In: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalaya.* Puja Publishers, New Delhi. Pp. 471–481.

125. **Bir, S.S., Gill, B.S. & Bedi, Y.S. 1982.** Cytological studies in some western Himalayan woody species I. Gamopetalae and Monochlamydeae. In: Paliwal, GS. (Ed.), *The Vegetational Wealth of the Himalaya.* Puja Publishers, New Delhi. Pp. 483–496.

126. **Bir, S.S., Bedi, Y.S., Gill, B.S. & Singhal, V.K. 1987.** "Forest vegetation characteristics of the Garhwal Himalaya". *Bull. Bot. Surv. India* 29(1-4): 292–318.

Abstract: General aspects of vegetation of the Shiwalik ranges and the Garhwal Himalaya between the altitudes 400-4200 m together with detailed floristic accounts of the typical forests, are provided. Main types of forests surveyed include moist sal bearing forests, tropical fresh water swamp forests, tropical dry deciduous forests, Himalayan Montane subtropical forests, Himalayan moist temperate forests, sub-alpine forests and alpine forests. Various forest types are illustrated by ield photographs. It is noted that there is a general decline in the forest cover and forest degradation is on the increase because of population pressure for more cultivable land and increased tourist flow in the region. Serious efforts at National level are needed to conserve the fast dwindling forest cover.

127. **Bisht, A.K., Manjkhola, S. & Joshi, M. 2013.** "Comparative account of two high value species of Himalayas: *Angelica glauca* Edgew. and *Angelica archangelica* Linn.". *Indian Forester* 129(10): 1241–1248.

Abstract: On the basis of secondary information and primary survey of prospective sites, a comparative account on distribution, status, habitat, specificity, morphology, ethnobotanical uses, active principle and threats to the two high value species of the Himalaya, *Angelica glauca* Edgew. and *A. archangelica* Linn. is described. Quantification of the species, biology of the species, regular monitoring of the populations and development of propagation protocols is required for *in-situ* and *ex-situ* conservation. Further *ex-situ* conservation of the species can prove beneficial in economic upliftment of the inhabitants and reducing presuure on the natural population of the species.

128. **Bisht, A.P.S. 1989.** *Microsite Mosaic and Undercanopy Vegetation Dynamics of Sal Communities in East and West Dehradun Forest Divisions.* Ph. D. Thesis, H.N.B. Garhwal University, Srinagar. (unpublished).

129. **Bisht, A.S. 2005.** *Ecological Studies of Some Important Medicinal Herbs, their Multiplication and Conservation in Garhwal Himalaya India.* Ph.D. Thesis. Garhwal University, Srinagar (Garhwal), Uttarakhand (Unpublished).

130. **Bisht, A.S. 2017.** "Weed floral diversity of medicinal value in terraces of Horticulture Crop fields in Bharsar, Uttarakhand, India". *Indian J. Pl. Genet. Resour.* 30(2): 153–161.

Abstract: An ethnobotanical survey was conducted in order to identify the medicinal weed fl ora of horticulture crop fi elds in University Campus, Bharsar, Pauri Garhwal (located at an elevation, of 1950 m in northwest Garhwal Himalaya of Uttarakhand) and to fi nd out the possibilities of utilizing these weeds. The information about the traditional potential uses of species was collected with the help of reference literature

of different medicine systems. The study revealed that 117 species of weeds belonging to 98 genera and 43 families in crop fi elds, possessed medicinal properties. The study suggested a tremendous scope of utilising these weeds to promote additional income to the inhabitants.

131. **Bisht, I.S., Nehta, P.S & Bhandari, D.C. 2007.** "Traditional crop diversity and its conservation on-farm for sustainable agriculture production in Kumaon Himalaya of Uttaranchal State: A case study". *Genet. Resource & Crop Evol.* 54: 345–352.

Abstract: Farming communities in traditional agroecosystems have been playing an important role in conserving agricultural diversity. They are not only the custodians but also managers of the crop diversity and maintain the dynamic processes of crop evolution and adaptation, the key elements of sustainable agricultural productions. The Himalayan highlands are important centres of crop plant diversity due to high ecological heterogeneity and high local socio-cultural integrations. The crop genetic diversity of Kumaon Himalaya in Uttarachal State of India has been documented in the present study. Existing crop genetic diversity at inter- and intra-species level was assessed and factors for changes in crop compositions and farming systems during the recent past were studied. Farmer management of rice landrace populations were studied in greater detail. Various benefit enhancing options for farmers from local crop diversity were scrutinized based on farmer perceptions and priorities for efficient management of local crop diversity on-farm and its sustainable utilization for agricultural production.

132. **Bisht, M., Chandra Sekar, K., Kant, R., Ambrish, K., Singh, P. & Arya, D. 2018.** "Floristic diversity in Valley of Flowers National Park, Indian Himalayas". *Phytotaxa* 379(1): 1–26.

Abstract: Floristic diversity of Valley of Flowers National Park, Uttarakhand, a world heritage site in Indian Himalayan region has been documented. A total of 614 taxa (609 species, 3 subspecies and 2 varieties) belonging to 277 genera and 70 families have been recorded. Among these, 31 plant species are under different threat categories, 05 endemic and one plant namely *Cuscuta europaea* recorded as invasive. The paper, for the first time, records 72 plant species as additions to flora of Valley of Flowers National Park. Importance of floristic diversity and conservation needs are also discussed.

133. **Bisht, M.K. & Bhatt, K.C. 1987–1988.** "Bibliography on floristic and ethnobotanical studies in Garhwal Himalaya". *J. Himal. Stud. Reg. Develop.* 11 & 12: 161–165.

134. **Bisht, M.S. 2000.** "Monitoring of vegetation cover and land uses in Nanda Devi Biosphere Reserve". *Indian Forester* 126(6): 664–673.

Abstract: The present paper attempts to show the impact of changes in the forest cover in one of the India' biosphere reserve– Nanda Devi Biosphere Reserve, which was constituted by Govt. of India on Feb. 4, 1998 to conserve the biodiversity and integrity of plants, animals and micro-organisms, not in isolation but in their totality as part of the wider natural ecosystem, safeguard genetic diversity of the species on which their continuing evolution depends and improve the socio-economic conditions of the people living in and around the reserves. The analysis provided in the paper shows that in Nanda Devi Biosphere Reserve area, the forest cover has increased showing a positive trend, which needs to be maintained.

135. **Bisht, M.S., Kukreti, M., Badoni, S., Bisht, S.S. & Dobriyal, A.K. 2012.** "Distribution, magnitude and adverse effects of invasive vegetation in Garhwal Himalaya, Uttarakhand". *Indian Forester* 138(11): 1024–1029.

Abstract: The present communication is about distribution, abundance and effects of three most common invasive plants *Lantana, Eupatorium* and *Parthenium* in district Chamoli and Pauri Garhwal of Uttarakhand, India. Findings of the survey conducted during the year 2008 and 2009 revealed that the invasive species has been well established in all ecological zones and habitats (except high altitudes above $\pm$ 2700 m) of the rea. The homogenization of these weed species was observed depleting the populations of many valuable native plant species as well as the wild life.

136. **Bisht, V.K., Kuniyal, C.P., Nautiyal, B.P. & Prasad, P. 2015.** "Integrated analysis of the trees and associated under-canopy species in a subalpine forest of western Himalaya, Uttarakhand, India". *J Mountain Sci.* 12(1): 154–165.

Abstract: Subalpine forests are known as outstanding habitats due to co-existence of both temperate and alpine vegetation and are classic example of ecotonal zones. Limited but diverse physiognomy of trees inhabiting in subalpine forest results in variability within under-canopy habitat conditions. Studies were undertaken to assess population status, habitat preference and interferences to the trees and associated under-canopy herbs in a subalpine forest of western Himalaya. A total of 10 woody and 23 under-canopy herbs were recorded in the selected subalpine forest area. At each stand, the number of tree species and under-canopy herbs ranged from 2 to 4 and 8 to 10 respectively. *Abies spectabilis, Acer caesium, Quercus floribunda, Q. semecarpifolia* and *Rhododendron arboretum* were key tree species in this area. The density of main woody species was 280 to 1190 individuals ha^{-1} at different stands. Herbaceous plants with rosette and clump growth habits were observed to have higher values for total basal cover and importance value index. Presence of some under-canopy herbs like; *Dactylorhiza hatagirea, Malaxis muscifera, Picrorhiza kurrooa, Polygonatum cirrhifolium* and *Skimmia laureola* in the specific habitats also showed that they are habitat specific. However, the presence of *Frageria nubicola* and *Viola* sp. was common in the selected stands. Felling of trees for timber, construction of temporary huts, fuel wood and lopping for fodder were main interferences for trees. On the other hand, trampling driven damage due to grazing, habitats degradation and overexploitation were observed key threats for under-canopy herbs. Integrated analysis including population studies, habitats preference and interferences to the trees and under-canopy herbs in this sensitive and important ecosystem will be useful for determining the conservation plans and ecosystem management.

137. **Biswas, S. 1975.** "Gregarious flowering of *Aechmanthera gossypina* (Nees) Nees in Mussoorie Hills". *Indian Forester* 101(1): 597–599.

Abstract: The gregarious flowering of *Aechmanthera gossypina* (Nees) Nees in Mussoorie hills is reported. The last published account of its gregarious flowering is

by Duthie dated 1890. The present record of the 1974 gregarious flowering and the studies through authentic herbarium specimens and relevant literature reveal that gregarious flowering is after twelve years. Field observations, economic aspects and general distribution are reported.

138. **Biswas, S. 1985b.** "Studies on the forest flora of Tehri Garhwal (Uttar Pradesh): Introduction, plant exploration and phytogeography". *Indian J. Forest.* 8(3): 199–204.

Abstract: Tehri garhwal lies at 30°55' & 31°18' N. Lat. and 78°09' & 79°25' E Long. in Western Himalaya covering 14,331 sq. km. area. The perpose of the study is to publish a Forest Flora of this important phytogeographical division to facilitate the workers of the Forest Department and revealing useful data on species of economic value such as timbers, pulpwood species and medicinal plants etc. for the purpose of their exploitation. The present paper is the outcome of the author's collection made from the year 1972 to 1976 and other earlier authentic collections preserved in the herbaria of Forest Research Institute (Dehra Dun) and Botanical Survey of India (Dehra Dun and Calcutta). The article deals with bibliographical account on introduction (climate, geology and ecology etc.), plant exploration (new records) and phytogeography (affinity, disjunct distribution, endemism and conservation).

139. **Biswas, S. 1994.** Potential economic forest produce of Tehri Garhwal Himalaya (Uttar Pradesh) with reference to systematic studies. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.* Addl. Ser.] 3: 281–287. Bishen Singh Mahendra Pal Singh, Dehra Dun.

Abstract: The present investigation is aimed at revealing useful data through the systematic studies on species of economic value such as timbers, pulpwood species and medicinal plants, etc. for the purpose of their efficient utilization.

140. **Biswas, S. & Chandra, S. 1996.** "Potential economic forest produces of Siwaliks with particular reference to vegetation of Rajaji National Park". *J. Non-Timber Forest Prod.* 3: 56–59.

141. **Biswas, S., Jain, S.S. & Pal, M. 2002.** "A note on the flowering behaviour and a new infraspecific combination under *Drepanostachyum falcatum* (Nees) Keng in Kumaon Himalaya of Uttaranchal". *Indian J. Forest.* 25(4): 476–478.

Abstract: Uptodate nomenclature, taxonomic description, distribution, flowereing cycle and behaviour of *Drepanostachyum falcatum* (Nees) Keng in Kumaun Himalaya of Uttaranchal has been discussed and also a new variety of this species viz., *D. falcatum* var. *glameratum* has been proposed.

142. **Biswas, S., Jain, S.S., Pant, S.C. & Pal, M. 2003.** "A note on the flowering of *Dendrocalamus somdevae* Naithani in Kumaun hills, Uttaranchal". *Indian J. Forest.* 26: 95–96.

143. **Bor, N.L. 1941.** "Common grasses of United Provinces". *Indian Forest Rec. (Bot.)* 2:1–220.

144. **Brandis, D. 1874.** *Forest Flora of North-West and Central India.* London.

145. **Butola, J.S. & Samant, S.S. 2013.** "*Saussurea* species in Indian Himalayan Region: diversity, distribution and indigenous uses". *Int. J. Pl. Biol.* 1(1): 1–9.

146. **Butola, J.S., Pant, S. & Samant, S.S. 2007.** "Diversity, distribution and indigenous uses of the *Hypericum* species in Indian Himalayan region". *Ethnobot. Leafl.* 11: 16–23.

Abstract: The genus *Hypericum* is known worldwide for its traditional and modern uses. Therefore, an attempt has been made to assess the diversity, distribution and indigenous uses of the species of this genus in the Indian Himalayan Region (IHR). A total of 27 species of *Hypericum* were recorded from the IHR, of these 17 were economically important. Thirteen species were native to the Himalayan region, 3 were endemic and 6 were near endemic species. Amongst the species, *Hypericum perforatum* was the most valued species used for fuel, fodder, dying and medicine, and for the extraction of hypericin. Due to over exploitation of this species for the pharmaceutical industries, the natural populations of this species are depleting fast and this species have been placed under vulnerable category of the IUCN. Similarly, due to multiple utility of the *H. choisanum*, *H. oblongifolium* and *H. sampsonii*, these species are also facing high pressures. It is expected that like *H. perforatum*, other species of *Hypericum* may have high concentration of hypericin. Therefore, chemical extraction of these species has been suggested for the identification of potential of these species. The population assessment using standard ecological methods and development of propagation protocol have been suggested.

147. **Champion, H.G. 1967.** "The Milam country of East Kumaon, U.P.". *Indian Forester* 93(1): 4–6.

148. **Champion, H.G. & Lambert, W.J. 1921.** "Notes on a visit to the Pindari glacier in Kumaon". *Indian Forester* 47(1): 11–21.

149. **Chand, D., Laxmi, V., Sati, J. & Nautiyal, M.C. 2016.** "Status of priority based subsidized MAP species for cultivation and conservation in Chamoli district, Uttarakhand Himalaya". *J. Non-Timber Forest Prod.* 23(4): 181–189.

Abstract: Cultivation of Medicinal and Aromatic Plants (MAPs) is considered as one of the most important tool for conservation of wild MAP species, ensure regular supply of raw material to pharmaceutical industries and also plays crucial role in the upliftment of socio-economic status of local farmers for their livelihood security. Cultivation of MAPs seems to be a viable solution for raising the economy of the fanners of Uttarakhand Himalaya as MAPs can be grown successfully in stressful and adverse conditions. To know the actual status of MAPs cultivation sector, with an aim to gather information about the initiatives and policies launched by government for the promotion of cultivation, prioritized species for cultivation and economic benefit of farmers through cultivation. The study revealed that various organizations were engaged in the promotion of MAPs cultivation and a number of policies were launched by the government such as subsidies to farmers on 26 prioritized species, free planting material, training, nursery development course, registration and certification of farmers, etc.

150. **Chandola, S. 2005.** "Some rare and imperfectly known medicinal plant species of Uttaranchal". *Indian Forester* 131(3): 341–345.

Abstract: Valuable species have been removed for so long and so intensively from the wild that they have come to the brink of extinction. The market forces, however have been so strong that substitutes have emerged to satisfy the demand, and over time the substitute has assumed the importance of the original drug. The present paper deals with correct identity of Akarkara (*Anacyclas pyrethrum*), Chirayita (*Swertia chirata*), Kuth (*Saussurea costus*), Salam Mishri (*Eulophia dabia*). *Gentiana kurroo* has been rediscovered after a lapse of 50 years. It is time now to educate ourselves and to adopt the latst benefits of modern science to retrieve the true herbs species from final annihilation. Serious Species Recovery Programmes need to be initiated for the highly threatened plants.

151. **Chandola, S. 2009.** *Vegetational Inventory of Cold Desert Habitat of Nilang Area of Jadh Ganga Catchment (Uttarkashi) in Garhwal Himalaya.* H.N.B. Garhwal University, Srinagar. Ph. D. Thesis (unpublished).

152. **Chandola, S. 2011.** *Vegetational Inventory of Cold Desert Habitat of Nilang Area of Jadh Ganga Catchment (Uttarkashi) in Garhwal Himalaya.* Lambert Academic Publishing (LAP) GmBH & Co., KG, Deutschland.

153. **Chandola, S., Naithani, H.B. & Rawat, G.S. 2008.** Nilang: A little known Trans-Himalayan valley in Uttarakhand and its floral wealth. In: Rawat, G.S. (Ed.), ENVIS Bulletin [Wildlife and Protected Areas] 11(1): *Special Habitats and Threatened Plants of India.* Wildlife Institute of India (WII), Dehradun. Pp. 9–15.

154. **Chandra Sekar, K. 2012.** "Invasive alien plants of Indian Himalayan region– Diversity and implications". *American J. Pl. Sci.* 3(2): 177–184.

Abstract: The present study deals with comprehensive list of Invasive alien plants of Indian Himalayan Region with background information on family, habit and nativity. A total of 190 invasive alien species under 112 genera, belonging to 47 families have been recorded. Among these, the dicotyledons represent by 40 families, 95 genera and 170 species; monocotyledons represent by 7 families, 17 genera and 20 species. The analysis of invasive species reveals that 18 species have been introduced intentionally, while the remaining species established unintentionally through trade. In terms of nativity, amongst 13 geographic regions, the majority of invasive plants reported from American continent (73%). While in life form analysis, the herbs (148 species) are dominant, followed by shrubs (19 species), Grass (11 species), Trees (4 species), sedges and climber (3 species each). Most of the invasive species are annual habit (63%). Apart from these, 90 species (47%) are being used by locals for medicinal purposes. A better planning is needed for early detection to control and reporting of infestations of spread of new and naturalized weeds to be monitored.

155. **Chandra Sekar, K. & Rawat, B. 2011.** "Diversity, utilization and conservation of ethnomedicinal plants in Devikund– A high altitude sacred wetland of Himalaya". *Med. Pl. Int. J. Phytomed. & Related Industries* 3(2): 105–112.

Abstract: The Devikund is located in Sunderdunga Valley of Bageshwar District, Uttarakhand, India. The high altitude wetland harbors a number of medicinal plants used in different purposes in traditional healers. A total of 62 medicinal plants have been enumerated in the present communication, with correct binomials, family, life form and local name(s) with detailed ethnomedicinal uses. Out of these enumerated plants, 14 species are categorized under different threat category. The populations

of these threatened plants are already depleting from the wild and the inhabiting peoples nearby wetlands are collecting the plants inevitably from the wild locations. It is also necessary to monitor such rare plants to prevent their extinction. The wetland can also be conserved through religious aspects and should be declared as a conservation area, which would lead to the preservation of many important plant species.

156. **Chandra Sekar, K. & Srivastava, S.K. 2010.** "*Rhododendrons* in Indian Himalayan Region: Diversity and conservation". *American J. Pl.* Sci. 1: 131–137.

Abstract: The genus *Rhododendron* of Indian Himalayan Region (IHR) has been enumerated in the present paper. A total of 87 species, 12 subspecies and 8 varieties of Rhododendrons recorded in IHR, among these 6 species and one subspecies are reported from Western Himalaya. The maximum concentration of 86% observed in Arunachal Pradesh (75 species). The species of Rhododendrons exhibit significant diversity in habit and broad range of distribution from the altitude of 800-6000 m and the best range is observed in 3001-3500 m altitudes. In analysis revealed 20 taxa are endemic, 30 are rare, 24 are threatened / endangered, 3 are vulnerable and 47 taxa have to be assessed. The major threats to rhododendrons are deforestation and unsustainable extraction for firewood and incense by local people has been discussed.

157. **Chandra Sekar, K., Giri, L. & Negi, V.S. (2016). 2017.** "Floristic diversity status assessment of threatened and high value medicinal plants of Nanda Devi National Park, Uttarakhand, India". *Phytotaxonomy* 16: 58–75.

Abstract: Protected areas refer to a very wide range of lands and water management types that have some value for biodiversity and landscape conservation. Nanda Devi National Park (NDNP) is one of the biodiversity rich protected areas in Uttarakhand which comprises 409 taxa belonging to 203 genera and 71 families of Angiosperms, Gymnosperms and Pteridophytes. Among 409 taxa, 15 IUCN threatened species are growing in core zone of NDNP with good numbers. Most of them possess medicinal properties and used in various Ayurvedic formulations curing various diseases. Overall, the study indicates that after protecting the area, plants are proliferating very well and such strategies should replicate for conservation and sustainable use of biodiversity.

158. **Chandra Sekar, K., Manikandan, R. & Srivastava, S.K. 2012.** "Invasive alien plants of Uttarakhand Himalaya". *Proc. Natl. Acad. Sci. India,* B 82(3): 375–383.

Abstract: The present study deals with invasive alien plants of Uttarakhand Himalaya. A total of 163 invasive alien species under 105 genera, belonging to 46 families have been recorded based on field observations, herbarium and literature consultations. Distribution of invasive species based on habitat shows that the maximum number of species are found in wastelands (48%), followed by cultivated fields (20%), along road sides (14%) and forests (8%). Among these invasive species, 84 species are being used by local inhabitants for medicinal purposes. A better planning is needed for early detection to control and report the infestations of spread of new and naturalized weeds to be monitored.

159. **Chandra Sekar, K., Pandey, A. & Giri, L. 2014.** "Floristic diversity in Milam valley: A cold desert region of Uttarakhand". *Int. J Res. Engnr. Biosci.* 2(6): 143–147.

160. **Chandra, B., Palni, L.M.S. & Nandi, S.K. 2006.** "Propagation and conservation of *Picrorhiza kurrooa* Royle *ex* Benth.: An endangered Himalayan medicinal herb of high commercial value". *Biodivers. & Conserv.* 15: 2325–2338.

Abstract: *Picrorhiza kurrooa* Royle ex Benth., a high value medicinal herb of alpine Himalaya and a source of hepatoprotective picrosides, is listed as 'endangered' due to heavy collection from its natural habitat. The present report deals with successful propagation of this species using both conventional and *in vitro* techniques. Vegetative propagation was achieved by rooting runner cuttings with indole-3-butyric acid (IBA) or α-naphtheleneacetic acid (NAA) treatment before planting. Nearly 87% rooting success was achieved by treatment of cuttings with 50.0 μM IBA. Seeds were given a presoaking treatment with gibberellic acid (GA_3), 6-benzylaminopurine (BAP) or a combination of both to influence germination. More than 11-fold improvement in germination was recorded in seeds treated with 250.0 μM GA_3. *In vitro* shoot multiplication was achieved through sprouting of axillary buds using nodal segment. Multiple shoots were formed following culture for 3 weeks on Murashige and Skoog (MS; 1962. Physiologia Plantarum 15: 473–497) medium containing 1.0 μM BAP. Cent percent rooting success, without basal callus formation, was observed when individual microshoots were placed in MS medium supplemented with IBA. The plantlets raised using conventional as well as tissue culture methods were hardened and successfully established in the experimental field located at 2450 m elevation. In addition, strategies have been discussed to encourage cultivation and *in situ* conservation of this highly valued medicinal herb so as to reduce pressure on its natural populations.

161. **Chandra, D., Prasad, K., Kohli, G., Devrani, M.K., Bisht, G. & Pandey, B. 2017.** "Antifungal activity of *Swertia ciliata* (Family- Gentianaceae), *Acorus calamus* (Family-Araceae) and *Viola serpens* (Family- Violaceae) from Pithoragarh, Uttarakhand Himalayas, India". *J. Med. Pl. Stud.* 5(6): 6–10.

Abstract: Plant essential oils are potential source of antimicrobials of natural origin. Essential oils and extracts obtained from many plants have recently gained a great popularity and scientific interest. Consumer demand for natural preservatives has increased, whereas the safety aspect of chemical additives has been questioned. The plant oil has been reported to have antibacterial, antifungal, antiviral, antiparasitic and antidermatophytic properties. Thus, this study aimed to investigate the antifungal activity of three essential oils (EOs), against *Picher guilliermondii* and *Candida albicans* strains. Three medicinally important plants *Swertia ciliata*, *Acorus calamus* and *Viola serpens* were evaluated for their antifungal activities. The oil of *Swertia ciliata* had moderate to good activity against the tested *Candida albicans* pathogens and the oil of *Acorus calamus* and *Viola serpens* show good activity against *Pichia guilliermondii* on the basis of zone of inhibition and MIC values. These results support the plant oils can be used to cure mycotic infections and plant oils may have role as pharmaceutical and preservatives.

162. **Chandra, K. & Pande, H.C. 1983.** "Collection of plants around Agora-Dodital in Uttarkashi district of Uttar Pradesh, with medicinal values and folklore claims". *Int. J. Crude Drug Res.* 21(1): 21–28.

163. **Chandra, P. & Uniyal, V.K. 1999.** "Structure of forest vegetation along an altitudinal gradient in the Valley of Flowers National Park and its vicinity, Western Himalaya". *Ann. Forest.* 7(1): 60–69.

Abstract: The structure of forest vegetation along an altitudinal gradient (2550-3600 m) in the Valley of Flowers National Park (VOF) and its vicinity in Western Himalaya was surveyed using 25 quadrats of 10x10 m for trees and 5 x 5 m for shrubs. Three major vegetation types i.e. Himalayan Moist Upper Temperate Forest (HMUTF- 2550-3000 m), Sub-alpine Fir Forest (SFF- 3000-3250 m) and Sub-alpine Birch Forest ((SBF- 3300-3600 m), were identified based on Importance Value Index (IVI). The average tree density increases with the altitude however, the average basal area of tree species decreases with altitude. The low value of tree density (338 trees/ha) with high basal area (49.76 m^2/ha) in SFF is attributed to high biotic interference and dominance of coniferous species. The indices of tree species diversity and richness decreases with the increasing altitude from 2550 to 3600 m elevation. In terms of shrubs density *Princepia utilis* Rorle and *Rosa macrophylla* Lindl. Were the dominant and *Aster peduncularis, Gaultheria tricophylla* Royle and *Ribes glaciale* Wall. in SBF. Sapling of *Rhododendron arboretum* Sm., *Taxus wallichiana* Zucc. and *Syringa emodi* Wall. were highest in HMUTF, SFF and SBF respectively.

164. **Chandra, R. 1991.** An Altitudinal Pattern of Woody Vegetation along Water Courses in parts of Central Hiamalaya. Ph. D. Thesis, Kumaun University, Nainital (unpublished).

165. **Chandra, S. & Rawat, D.S. 2016b.** "Morphological and anatomical properties of Himalayan herb *Stellaria webbiana*". *Int. J. Environm.* 5(2): 26–35.

166. **Chandra, S., Rawat, D.S. & Pusalkar, P.K. 2016.** "Nomenclature note on *Arenaria depauperata* (Caryophyllaceae)". *Phytotaxa* 291(2): 167–169.

Abstract: On the basis of recent molecular studies (e.g., Harbaugh *et al.* 2010, Greenberg & Donoghue 2011, Dillenberger & Kadereit 2014, Sadeghian *et al.* 2015), the genus *Arenaria* Linnaeus (1753: 423), as traditionally circumscribed, cannot be manteined, and 4 genera are currently recognized: *Eremogone* Fenzl (1833: 13) [a" *Arenaria* subg. *Eremogone* (Fenzl) Fenzl (1842: 360)], *Odontostemma* Bentham ex Don (1831: 449) [a" *Arenaria* subg. *Odontostemma* (Benth. ex Don) Williams (1895: 603)], *Solitaria* (McNeill 1962: 128) Sadeghian & Zarre (2015: 667) (a" *Arenaria* subg. *Solitaria* McNeill), and *Arenaria s.str.* The criticism of this genus also occurs at lower ranks (subgenus, section, series) as showed by several botanists (e.g., McNeill 1962, Jackson & Parnell 1987, Li-hua 1996, Valcárcel *et al.* 2006, Iamonico 2013, Pusalkar & Singh 2015).

167. **Chandra, V. 2004.** "Plant diversity (angiosperm) of stress sites of Sultanpur (Uttar Pradesh)". *Bull. Bot. Surv. India* 46(1-4): 254–267.

Abstract: Eighty six species of angiosperms have been recorded from the Sodic soil affected stress sites of Sultanpur district of Uttar Pradesh.

168. **Chandran, M. 2005.** The Alpine Grass Cover of Uttaranchal. In: Rawat, G.S. (Ed.), *Alpine Meadows of Uttaranchal*. Bishen Singh Mahendra Pal Singh, Dehradun. Pp. 167–188.

169. **Chandran, M. 2008.** Some plants of taxonomic and high conservation significance in Uttarakhand Himalaya. In: Rawat, G.S. (Ed.), ENVIS - *Special Habitats and Threatened Plants of India*. WII, Dehra Dun. Pp. 45–49.

170. **Chaudhary, L.B. & Rao, R.R. 1998.** "Notes on the genus *Aconitum* L. (Ranunculaceae) in North-West Himalaya (India)". *Feddes Repert.* 109(7-8): 527–537.

Abstract: *Aconitum* (Ranunculaceae) in North-West Himalaya is represented by ten species and two varieties. Although most species of *Aconitum* exhibit remarkable morphological variations, no infraspecifc taxa have been recognized (except under *A. heterophyllum*) as these variation are observed to be continuous. *A. heterophyllum* and *A. violaceum* are shown to be morphologically highly diverse. Genetic diversity in this group is least studied. The taxonomic treatment of the genus includes a key to all species, correct nomenclature, distribution and useful taxonomic notes, where possible. In the present study *A. ovatum* and *A. cordatum* have been shifted back under *A. heterophyllum*. *A. kashmiricum* is also treated here as a morphological variant of *A. heterophyllum*. *A. balfourii* var. *rhombilobum, A. falconri* var. *latilobum, A. heterophyllum* subsp. *parciflorum, A. laeve* var. *curvipilosum, A. violaceum* var. *robustum and A. violaceum* var. *weilerii* have been reduced as synonyms under their typical varieties. *A. falconeri* has been reported for the first time from Kumaon Himalaya. *A. heterophyllum* var. *roylei* var. *nova* is described here as a new variety. Lectotypification has also been done for a few species. Discussing the current status of the species, it is said that owing to the medicinal virtues, most species of the genus have become critically endangered in their type localities. Both - *in situ* and *ex situ* -efforts are recommended to conserve the genetic diversity in these species.

171. **Chaudhary, R.S. 2010.** "Taxa of family Fabaceae: A potential of local medicinal values in vindhya region Uttar Pradesh, India". *Int. J. Pharma & Bio Sci.* 1(4): B46–B53.

Abstract: The Vindhya region of Uttar Pradesh includes Mirzapur and Sonbhadra districts, which is mostly covered with forest. During exploration of this region we collected 51 species of 35 taxa is belonging to the family Fabaceae. Among these species an account of 23 ethno-medicinal information which is traditional used by tribes like Gond, Kols, Mushar, Baiga & Nutts from this region and 19 species are used as medicines in the welfare of the people. The ethno-medicinal uses, disease, localities and field numbers has been provided in this paper.

172. **Chaudhary, S., Gupta, A.K. & Kumar, L. 2012.** "The sedges and grasses of Gautambudh Nagar (Noida) U.P. India". *Int. Multidisciplinary Res. J.* 2(3): 45–48.

Abstract: The present study is the result of two years (April 2005-April 2007) of extensive survey and exploration of sedges and grasses of Gautambudh Nagar. A total number of 95 species of Cyperaceae and Gramineae (Poaceae) have been collected from this area. Out of 95 species of these two families belonging to 68 genera, 65 species belong to Gramineae (Poaceae) and 30 species belong to

Cyperaceae. There are two plants of Cyperaceae and Gramineae (Poaceae) respectively: *Eleocharis capitata* R. Br. and *Isachne albens* Trin., which have been reported for the first time from this area.

173. **Chauhan, A., Verma, R.S. & Yadav, A.K. 2011.** "Diversity of timber yielding medicinal taxa in Kumaon Himalaya, Uttarakhand". *J. Econ. Taxon. Bot.* 35(3): 455–464.

Abstract: The communication deals with timber yoielding taxa of Kumaun Himalaya which are of medicinal significance apart from the other local use. Floristic analysis yielded 62 timber yielding elements belonging to 55 genera under 32 families which are found to occur in Kumaon Himalaya.

174. **Chauhan, L.S., Sharma, N. & Manhas, R.K. 2011.** "Phytosociological study of Bamboo plantation and natural forest of Kalsi Forest Division of Doon valley". *Indian J. Forest.* 34(2): 143–150.

Abstract: Phytosociological study of the restored bamboo plantation and natural bamboo plantation was carried out in the Kalsi Forest Division of Doon valley. The study was conducted on the three strata (Tree, Shrub and Herb) in both sites viz. Bamboo forest as well as natural forest. The study reveals the maximum density 910020 plants/ha, 5 plants/ha and 3 plants/ha) was recorded for bamboo sites for tree, shrubs and herbs respectively. Meanwhile, maximum number of species richness (19) was recorded for tree and (28) for shrub and herbs for natural forest. Concentration of dominance showed reverse trend to diversity index. The maximum value of concentration of dominance (0.90, 0.20 and 0.10) was recorded for tree, shrub and herb species of Bamboo forest.

175. **Chauhan, O.S., Gupta, B.K. & Hajra, P.K. 1990.** Scrophulariaceae of North West Himalaya– A census. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.,* Addl. Ser.] 1: 75–116. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: In the present paper 154 species belonging to 35 genera of the family Scrophulariaceae has been reported from North West Himalaya.

176. **Chauhan, P. 2014.** *Taxonomic and Ecological Studies on Flowering Plants of Uttarakhand with special reference to Dehradun and adjacent Shiwalik region.* Ph. D. Thesis. H.N.B. Garhwal University, Srinagar (unpublished)

177. **Chauhan, P.S., Manhas, R.K. & Negi, J.D.S. 2001.** "Demographic and diversity analysis of tree species in Sal forests *(Shorea robusta* Gaertn. f.) of Doon valley". *Ann. Forest.* 9(2): 188–198.

Abstract: the demographic studies were carried out in 11 sites and 367 quadrats covering almost all the major Sal (*Shorea robusta* Gaertn.f.) forests of Doon valley. The outcome of these studies was analysed for IVI, TWINSPAN (Two Day Indicator Species Analysis) and different diversities. *Shorea robusta* showed maximum IVI, ranging from 65.34-285.28. TWINSPAN classified the 11 sites into 5 groups and 44 tree species into XIII groups on the basis of indicator species and IVI values respectively. The species association of *Shorea robusta* and *Syzygium cumini* was also established by TWINSPAN. The diversity study shows maximum alpha diversity (21) in Thano Mortality (Site- I). The species diversity (H') ranged between 0.09-2.27 and eveness ranged between 0.02-0.84.

178. **Chauhan, P.S., Negi, J.D.S., Singh, L. & Manhas, R.K. 2009.** "Demographic dispersal and diversity in a dry *Shorea robusta* Gaertn.f. (Sal) forest of Rajaji National Park, India". *Indian J. Forest.* 32(4): 529–532.

Abstract: Present study was conducetd in the dry Sal forest at Phandowala, situated in Ramgarh Forest Range of Rajaji National Park. The results of the study reveals that (1) demographic dispersal of species has not changed much in all the three layers viz., tree, shrub and herbs, (2) Sal forest at Phandowala is experiencing significant changes in the species richness, species diversity and concentration of dominance and (3) the conversion rate of Sal seedlings to saplings is nil, which means no regeneration of Sal.

179. **Chauhan, S.V.S. & Chandra, S. 2003.** "Some new hosts of *Santalum album* L. from Agra". *Ann. Forest.* 11(1): 133–135.

Abstract: Eleven new hosts of three different categories (ggod, moderately good and poor) for *Santalum album* L., a semi-parasitic, were discovered from the garden of Agra. *Iresine lindenii* (Amaranthaceae), and *Vernonia revolute* (Asteraceae) served as the bost hosts on which the early growth of the sandal seedlings was not only vigorous but the seedlings established into well developed trees within 2-3 years.

180. **Chauhan, U.S. & Dey, A.C. 1971.** "Aquatic and marshy Angiosperms of Roorkee sub-division". *J. Bombay Nat. Hist. Soc.* 68(3): 750–756.

Abstract: Seventy eight species belonging to 46 genera and 31 families of aquatic and marshy angiosperms has been enumerated in the present paper. The family Cyperaceae is dominant in the area.

181. **Cheema, J., Bhattacharya, A. & Aggarwal, A. 2014.** "Chakrata: A floristically less explored pocket of Garhwal Himalaya". *Researcher* 6(8): 45–50.

Abstract: Chakrata Forest Division, located in Garhwal Himalaya, harbors a rich floristic diversity due to great variations in its topography, altitude and climate. Although from the vary past, many workers have focused on the exploration of floristic diversity of different places of Garhwal Himalaya but only a few reports are available on 'Chakrata'. The available reports about this area are mainly concerned with the ecological and ethnobotanical aspects. So a great lacuna is prevailing in the scenario of the floristic study of this region. The flora of this region is undergoing great stress due to anthropogenic disturbances mainly from the rapid urbanization and tourism, making the situation alarming day by day. So, floristic study and diversity assessments are obligatory to understand the present diversity status and conservation of biodiversity. The present review paper gives a brief idea about the previous and present picture of the floristic diversity of this study area.

182. **Chowdhery, H.J. & Agarwala, D.K. 2013.** *A Century of West Himalayan Orchids.* Bishen Singh Mahendra Pal Singh, Dehra Dun.

183. **Chowdhery, H.J. & Rao, R.R. 1990.** "Plant life in the Himalayan Cold Deserts: Some Adaptive Strategies". *Bull. Bot. Surv. India* 32: 43–56.

184. **Dadhwal, K.S. 1998.** "Performance of some plant species in limestone mine spoil". *Indian Forester* 124(3): 261–263.

Abstract: The present paper deals with the evaluation of thirteen native trees, shrubs and grass species for their survival, growth and biomass production in limestone mine spoil soil of Sahasradhara mine sites (Chamsari) of Dehradun district.

185. **Dadhwal, K.S. & Singh, B. 1993.** "Rooting behaviour of different plant species in limestone mined area". *Indian Forester* 119(1): 71–74.

Abstract: Rooting behaviour studies were undertaken to evaluate the relative performance of thirteen species of trees, shrubs and grasses viz., *Eucalyptus* hybrid syn. *E. tereticornis* (Eucalyptus), *Grewia optiva* (Bimal), *Bombax ceiba* (Semla), *Bauhinia retusa* (Kachnar), *Leucaena leucocephala* (Subatul), *Ipomoea carnea* (Sadabahar), *Agave Americana* (Rambans), *Pueraria hirsuta* (Kudzu), *Arundo donax* (Narkul), *Pennisetum purpureum* (Hathighas), *Brachiaria mutica* ((Paraghas), *Chrysopogon fulvus* (Golda) and *Eulaliopsis binata* (Bhabar) on abandoned limestone minespoil from outer Himalayas of Uttar Pradesh. Highest soil binding factor was found in *Leucaena leucocephala* (502), *Agave Americana* (624) and *Pennisetum purpureum* (1736) among trees, shrubs and grasses species, respectively. Total root length was also recorded highest in the said species.

186. **Dakshini, K.M.M. 1960a.** "The vegetation of Mothronwala swamp forest– A preliminary survey". *Bull. Bot. Surv. India* 2(1&2): 57–59.

Abstract: This paper is an introduction to the detailed study of the vegetation of the Mothronwala swamp forest near Dehra Dun and gives an account of the floral elements constituting the three main zones, viz., the ridge, the slopes facing the swampy zone and the swampy zone itself. Name of typical species in the vegetation cover of a variety of habitats met with in these zones are included in the descriptive account.

187. **Dakshini, K.M.M. 1960b.** "The vegetation of Mothronwala swamp forest (plant communities of swampy zone)". *Indian Forester* 86(12): 728–733.

Abstract: Based on quadrat studies, fourteen plant communities have been recognised in the swampy zone of the Mothronwal swamp forest near Dehra Dun. Some of the communities recognised form pure and open stands while others are of mixed and closed type.

188. **Dakshini, K.M.M. 1965.** "A study of vegetation of Mothronwala swamp forest, Dehradun, India". *J. Indian Bot. Soc.* 44: 411–428.

Abstract: Three hundred sixty seven species have been reported from Mothronwala swamp forest and these include 38 tree species, 52 shrubs, 42 climbers and 235 herbs. Leguminosae is the dominant family with 51 species and the genus *Ficus* is the largest with 10 species.

189. **Dakshini, K.M.M. 1970.** "Flora of Mothronwala swamp forest (District Dehra Dun, U.P., India)". *J. Bombay Nat. Hist. Soc.* 67(2): 176–186 & 71(2): 235–243.

Abstract: The Mothronwala swamp forest lying at the foot of the Himalayas in the Dehra Dun district, U.P., India, was selected for a detailed study of its flora. 367 species of flowering plants and ferns were collected from which 356 are angiosperms and 11 ferns.

190. **Dang, R. 1993.** *Flowers of Western Himalaya.* Indus Publishing Co., New Delhi.

191. **Dangwal, L.R. 1993.** *A Taxonomic Survey of Leguminous Plants* of *Garhwal Himalaya.* Ph.D. Thesis, H.N.B. Garhwal University, Srinagar (unpublished).

192. **Dangwal, L.R., Sharma, A., Singh, A., Rana, C.S. & Singh, T. 2011.** "Weed flora of S.R.T. campus, Badshahi Thaul Tehri Garhwal (H.N.B. Garhwal Central University, Uttarakhand), India". *Pakistan J. Weed Sci. Res.* 17(4): 387–396.

Abstract: Weed inventory was conducted in S.R.T. Campus Badshahi Thaul Tehri Garhwal (H.N.B Garhwal Central University, Uttarakhand), India during 2007 to 2010. Plant specimens were collected, dried, pressed and mounted on herbarium sheet and deposited in the Department of Botany, S.R.T. Campus Badshahi Thaul, Tehri Garhwal. The status of each taxa was determined by taking frequency percentage. During the survey, a total of 72 weed species belonging to 56 genera and 27 families were identified. Asteraceae was found to be the most dominant family in the campus contributed 23.6% followed by Fabaceae and Amaranthaceae (9.7%) each. Most of the species were annual (61.1%), followed by perennial and biennial with 36.1% and 2.7%, respectively. Most abundant species were *Achyranthes aspera* L., *Amaranthus virdis* L., *Bidens pilosa* L., *Chenopodium album* L., *Conyza bonariensis* (L.) Cronquist., *Coronopus didymus* (L.) Smith., *Cynodon dactylon* L., *Gallinsoga parviflora* (Cav.) Icon. Descr., *Eupatorium adenophorum* Spren., *Parthenium hysterophorus* L. and *Lespedeza gerardiana* Graham ex Maxim.

193. **Dar, T.A., Habib, B. & Khan, J.A. 2010.** "Vegetation structure along an altitudinal gradient in Phakot watershed in Garhwal Himalaya, Uttarakhand, India". *Indian Forester* 136(11): 1550–1558.

Abstract: The paper deals with the variation of the vegetation along an altitudinal gradient in the Phakot Watershed- mosaic of civil and reserve forest inhabited by more than 20 hamlets. Phakot Watershed Area (PWA) is a part of Phakot beat of Saklana range of Garhwal Himalaya. The vegetation of the Phakot falls under Himalayan temperate forest. Tree cover (F= 6.189, P<0.000) and shrub cover (F= 9.313, P<0.000), varied significantly across different habitat types. Tree cover was highest at middle altitude. *Quercus leucotrichophora* was the dominant tree species (IVI 98.6) and contributed 31% of the total density of PWA. Aspect also showed variation in terms of density, diversity and richness of trees and shrubs in the PWA. Cluster analysis separated agriculture land as the most dissimilar habitat mainly because of lack of tree species. Phakot, being one of the micro-watershed areas of the Garhwal Himalaya, but its strategic location with respect to outer and inner Himalaya explained the gradation of the vegetation with respect to altitude and aspect.

194. **Datt, B., Rana, T.S., Husain, T., Pande, H.C. & Rao, R.R. 2003.** "Floristic diversity of Corbett Tiger Reserve, Uttaranchal: An overview". *Phytotaxonomy* 3: 24–31.

Abstract: Corbett Tiger Reserve (CTR) is one of the biodiversity-rich protected areas, situated in the foothills of Uttaranchal Himalaya, mainly in Pauri Garhwal and Nainital districts, covering an area of 1318.54 sq. km. This happens to be the oldest National Park of the Indian sub-continent. With a view to assessing the floristic diversity of the entire CTR, including both Corbett National Park and Sonanadi Wildlife Sanctuary, extensive botanical explorations were undertaken during 1999-2002. An inventory

of available plant species (angiosperms, gymnosperms, pteridophytes, lichens and bryophytes) of CTR has been made. An analysis of the flora of CTR revealed that about 912 species belonging to 556 genera and 168 families occur in the area. Out of them, 741 species belong to angiosperms, 2 to gymnosperms, 36 to pteridophytes, 25 to bryophytes and 108 to lichens. The flowering plants constitute the principal component of vegetation. In flowering plants, dicots out-number the monocots. Poaceae with 84 species is the most dominant family followed by Fabaceae (70 spp.), Asteraceae (55 spp.) and Cyperaceae (31 spp.). *Ficus* L. (15 spp.), *Cyperus* L. (13 spp.), *Desmodium* Desv. (11 spp.), *Crotalaria* L. (10 spp.) and *Lindernia* Allioni (9 spp.) are among the most diverse genera of flowering plants in CTR. Similarly, fern-allies *Selaginella* P. Beauv. (4 spp.) and lichen genera *Pyrenula* Ach. (13 spp.), *Pertusaria* DC. (13 spp.) and *Bacidia* De Not. (9 spp.) of non-flowering plants exhibit maximum diversity. An assessment of economic potential of the flora as well as status evaluation of rare and threatened plants has also been made.

195. **Dayal, R. 1980.** "A note on abnormal fruit in *Jacaranda mimosaefolia*". *Indian J. Forest.* 3: 86.

196. **De, A. & Hajra, P.K. 2014.** "Orchid diversity of Northwestern Himalaya and its conservation". *J. Orchid Soc. India* 28: 1–13.

Abstract: North Western Himalayas comprises the states of Jammu & Kashmir, Himachal Pradesh and Uttarakhand. The topography of NW Himalayan region is irregular and intercepted by valleys and plateaus of various extents and as such the stratification is not clear. There is a great diversity in the floristic pattern due to great altitudinal variation. The family Orchidaceae exhibit enormous diversity and is presented by *ca* 240 species. The paper highlights richness of the orchid diversity of the region and their conservation.

197. **Deva, Som. 1981.** "The genus *Globba* (Zingiberaceae) from Dehra Dun and Garhwal Himalaya". *Indian J. Forest.* 4(3): 230–234.

Abstract: *Globba* complex occurring round about Dehra Dun and Garhwal Himalaya has been studied and found to be fall under a single species- *G. racemosa* Smith.

198. **Deva, Som & Aswal, B.S. 1974.** "Taxonomy and ecology of Mothronwala swamp, a reassessment". *Indian Forester* 100(1): 12–19.

Abstract: Swamp in the Dehra Dun valley have come up as result of special topography where water oozes out in perennial streams. Original forest of Mothronwala has been completely replaced by *Pyrus pashia, Lantana camara, Xylosma longifolia* scrubs in all the three vegetational zones. Remnants of old forests are present as stumps. Succession on a limited scale of primary herbaceous and bush-fern stage is still perceptible. A provisional scheme leading to the development of swamp forest through *Bischofia javanica* as a pioneer tree community is provided.

199. **Deva, Som & Jain, S. 1979.** "A note on the identification of *Rivea* (Convolvulaceae) from Dehra Dun". *Indian J. Forest.* 2(3): 269–272.

Abstract: The correct identity of plant found in Dehra Dun is *Rivea ornata* (Roxb.) Choisy var. *griffithii* Clarke, it is distributed all along the base of outer Himalaya upto

1250 m. *R. laotica* Ooststr. Described from Indo-China apparently appears to be nothing but *R. ornata* (Roxb.) Choisy var. *griffithii* Clarke with only an extension of range.

200. **Deva, Som & Jain, S. 1980.** "Genus *Veronica* (Scrophulariaceae) in Dehra Dun valley". *Indian J. Forest.* 3(1): 81–85.

Abstract: The paper represents a systematic study of the genus *Veronica* Linn. in Dehra Dun valley. *V. persica* Poir. was fund to be a new addition to the flora of this region. Nomenclatural complexities existing between *V. polita* Fries (hitherto considered a European weed) and *V. didyma* Ten have been studied. The two species occurring in the valley are *V. javanica* Bl. and *V. undulata* Wall. A key, description of taxa and illustrations are provided for correct identification.

201. **Deva, Som & Naithani, H.B. 1974a.** "Cyperaceae of Dehradun valley and the adjacent Siwaliks". *Indian Forester* 100(10): 636–654.

Abstract: This work deals with the Cyperaceae of Dehra Dun valley and the adjacent Siwaliks covering an areas of 2290 sq. km. between 300 to 1000 m. R.N. Parker (1929) enumerated 30 species and 4 varieties belonging to 12 genera from this area, while the present list gives and 90 species and 2 sub-species belongs to 10 genera.

202. **Deva, Som & Naithani, H.B. 1986.** *The Orchid Flora of North West Himalaya.* Print & Media Associates, New Delhi.

203. **Deva, Som & Srivastava, M.M. 1978.** "An ecological studies on vegetation of Golatappar swamp, Dehra Dun". *Indian J. Forest* 1(1): 44–52.

Abstract: The present communication deals with the vegetational characteristics and successional trends in Golatappar swamp, Dehra Dun. Vegetational analysis was made by quadrate and line transects. Frequency, density, basal cover and IVI values were also determined. From this study it is evident that the vegetation is heterogenous and has been described under two main types, viz. swamp proper and swamp forest. Successional stages have been described such as hydrophytic, amphibious, sedges, bush and fern, cane break and pioneer tree community.

204. **Deva, Som, Srivastava, M.M. & Tripathi, G.S. 1982.** Fire resistant plants of sub-Himalayan tracts of Garhwal and Dehradun. In: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalaya,* New Delhi. Pp. 98–103.

205. **Devlal, R. & Sharma, N. 2007.** "Vegetational analysis along an altitudinal gradient in a temperate forest of Garhwal Himalayas". *Ann. Forest.* 15(2): 220–226.

Abstract: The present paper deals with the species composition, distribution pattern, diversity, concentration of dominance along an altitudinal gradient of Garhwal Himalaya. Vegetational analysis of tree species was analysed (identifying four forest stands along an altitude of 1200-1800 m). *Quercus leucotrichophora* emerged as a dominant species on the (Stand III, 1600 m and stand IV, 1800 m) with the highest IVI values 138.79 and 74.49, respectively. The total density ranged from 1,166 to 1828 trees/ha. Species diversity ranged from 1.00 to 2.07. Maximum diversity reported for Stand IV, 1800 m and minimum diversity (1.00) recorded foe Stand I, 1,200 m.

206. **Devlal, R. & Sharma, N. 2010.** "Dominance, diversity and species richness of tree species along an altitudinal gradient of a catchment of Garhwal Himalaya". *Indian Forester* 136(7): 943–950.

Abstract: The present paper highlights the dominance, diversity and species richness of tree species along an altitudinal gradient of Mandakini catchment of Garhwal Himalaya. A total number of six forest stands were slected along an altitudinal gradient of Mandakini catchment. The study revealed that density (trees/ha) and Total basal area (m^2/ha) values of the selected stands ranged between 2084 and 600 trees/ha and 53.44-29.36 m^2/ha. Maximum density 2084 trees/ha recorded for the forest stand IV and minimum 600 trees/ha for stand VI of Mandakini catchment. All the selected forest stands of the catchment area could be designated as broad-leaved mixed temperate forest. *Rhododendron arboreum* is the common species in all the selected stands of the carchment except the forest stands III and stand VI. Shannon-Wiener diversity index ranged between 1.16 and 1.66. Concentration of dominance showed reverse trend to diversity index. Highest number of tree species (6) was recorded in forest stand V and I. Stand III and VI are the most similar sites of the study area.

207. **Dey, A.C., Saxena, H.O. & Uniyal, M.R. 1968.** "Botanical exploration in the Bhagirathi valley with particular reference to medicinal plants". *Indian Forester* 95(3): 190–207.

Abstract: In the present paper enlists 165 species, including those of medicinal value has been reported from the Bhagirathi valley.

208. **Dey, A.C., Uniyal, M.R. & Shankar, V. 1969.** "Flora of the Bhillangna valley of the erstwhile Tehri-Garhwal state". *J. Bombay Nat. Hist. Soc.* 65(2): 384–409.

Abstract: This paper gives an account of a collection of plants from the Bhillangna valley of Tehri-Garhwal, made during the years 1963 to 1965 during which nearly 1400 specimens of 410 species were collected. The area covered by this study includes river valleys, glacier beds, mountain slopes and meadows ranging in altitude between 600 and 4200 meters.

209. **Dhar, U., Rawal, R.S. & Samant, S.S. 1997.** "Structural diversity and representatives of forest vegetation in a protected area of Kumaun Himalaya, India: Implications for conservation". *Biodiv. & Conserv.* 6: 1045–1065.

Abstract: Forest vegetation of a Protected Area (Askot Wildlife Sanctuary) in Kumaun (west Himalaya) was analysed for structure, composition and representativeness. A high percentage of non-natives were noticed in herbaceous flora of all representative forest types. Floristic representativeness in all growth forms (tree, shrub and herbs) increased significantly (tree, $p<0.05$; shrub and herbs, $p<0.01$) with altitude. The population structures of trees suggest, (i) expansion of riverine and *Pinus roxburghii* forests; (ii) compositional changes in *Quercus leucotrichophora* and *Quercus lanuginosa* forests, largely owing to preferred extraction demand of inhabitants; and (iii) infrequent regeneration and declining population of *Quercus semecarpifolia* and *Abies pindrow* forests. The possible pathways of non-native introduction in the study area were examined. Considering the existing status of forest vegetation and future trends, proliferation of non-native species in most forest types was discussed. It is suggested that the compositional changes vis-a-vis proliferation of non-native species need priority attention while initiating conservation activities in the reserve.

210. **Dhar, U., Rawal, R.S. & Samant, S.S. 1998.** Wild plant resources and inhabitants in Askot Wildlife Sanctuary of Kumaun in Indian Himalaya: Conservation Issues. In: Kotwal, P.C. & Banerjee, S. (Eds.), *Biodiversity Conservation in Managed and Protected Areas. Asro* Botanica, Bikaner. Pp. 128–142.

211. **Dhar, U., Samant, S.S., Rawal, R.S. & Sharma, S. 1997.** "Studies on the biota and resource utilization pattern of the natives in Askote Wildlife Sanctuary in West Himalaya, India". *Tiger Paper* 24(4): 12–18.

212. **Dhar, U., Manjkhola, S., Joshi, M., Bhatt, A., Bisht, A.K. & Joshi, M. 2002.** "Current status and future strategy for development of medicinal plants sector in Uttaranchal, India", *Curr. Sci.* 83: 956–964.

213. **Dhaulkhandi, M., Dobhal, A., Bhatt, S. & Kumar, M. 2008.** "Community structure and regeneration potential of natural forest site in Gangotri, India". *J. Basic Appl. Sci.* 4(1): 49–52.

Abstract: The article reported the regeneration potential and community structure of natural forest site in Gangotri, Uttarakhand. A total of seven tree species were recorded from the site. Among the trees, *Picea smithiana* was the dominant *and Cedrus deodara* was found co-dominant species. However, the highest (240 trees/ha) density was reported for *Pinus wallichiana* while least number of individuals (30 trees/ha) were recorded for *Acer caesium* and *Pinus wallichiana*. In tree layer the most of the species (65.16%) were distributed contagiously and few (34.84%) were distributed randomly. However, none of the species should regular distribution pattern. *Artemesia gamillinea* and *Cotoneaster gilgitansis* were the most and least dominant shrub species respectively. All species of shrub layer were distributed contagiously (100%). In the seedling stage, maximum number was observed for *Pinus wallichiana* (1080 seedling/ha) followed by *Picea smithiana* (1040 seedling/ha) which was recorded just after in sapling stage, because it shows more survival rate of *Picea smithiana* (600 sapling/ha) as compared to *Pinus wallichiana* (520 sapling/ha). As far as regeneration status was concerned, 71.4% species showed good regeneration, 14.3% species were facing the problem of poor regeneration whereas, only 14.3% species were not regenerating.

214. **Dhawan, V.K., Joshi, S.R. & Rana, I. 2008.** "Protected trees in the forests of Uttarakhand". *Indian Forester* 134(7): 937–946.

Abstract: Hundreds of trees are protected as living natural monuments and are associated with wisdom and immortality in India. In Uttarakhand, some trees hold special cultural and religious significance like peepal, banyan, mango etc. It was at the International Forestry Conference at Rome in 1926 that Protection of Natural Features was discussed. In 1929 Sir H.G. Champion, Silviculturist, Forest Research Insitute mooted the idea of preservation of elite trees along with establishment of Preservation Plots and Resolution No. 22 was passed. In 1951 Seth distinguished 3 types of preservation plots. By the time the country became independent, the subject of protected trees appeared to have fallen into neglect. In 1958, Bhadran, however,

gave the first comprehensive account of Giant Trees of India including trees girth of more than 100 inches at breast height. The growth of trees depends on many factors like seed origin/parent material, inheritance characters, edaphic, climatic etc. Growth of trees has found to be more in Tropical Wet evergreen/semi evergreen forests than trees in other forest type. In 2007-2008, authors from Silvicultural Division of Forest Research Institute have visited Preservation Plots of Uttarakhand and adjoining Shiwalik forest of Uttar Pradesh and surveyed protected trees which still have markings on their stem. Fresh enumeration was also done at sites and presented in the present paper. It was concluded from the study that due to global warming and intense biotic pressure, regeneration has been found to be abnormal. Increased biotic pressure threatened soe existing species. There is need to examine the causal inhibitor factors responsible for establishment of regeneration and elimination of some species.

215. **Dhyani, S. & Joshi, S.P. 2007.** "Angiospermic diversity of Karwapani fresh water swamp forest in Doon valley, Uttarakhand". *Indian Forester* 133(8): 1101–1108.

Abstract: The present study enumerates floristic diversity of Karwapani swamp forest in Doon valley, Uttarakhand. This study was conducted in the year 2002-2003. The plant diversity of Karwapani swamp forest is represented by 53 families, 130 genera and 155 species of angiosperms. The present study reveals low diversity of angiosperms when compared with Babu and Dahshini probably due to closed canopy of tree species. Dicots contributed approximately 83% of the floral diversity. The tree layer of the forest is dominated by *Shorea robusta,* which is associated with *Mallotus philippensis, Mangifera indica, Syzygium cuminii* etc., and the shrub layer is dominated by *Ardisia solanacea, Asparagus adscendens, Calamus tenuis, Clerodendrum viscosum* and *Lantana camara* while the herbaceous layer includes, *Nasturtium officinale, Ageratum conyzoides, Oplismanus composites, Pouzolzia pentandra* and *Mentha piperata.*

216. **Dhyani, S.K. & Sharma, R.K. 1987.** "Exploration of socio-economic plant resources of Vyasi valley in Tehri Garhwal". *J. Econ. Taxon. Bot.* 9(2): 299–310.

Abstract: The present paper reports 192 useful, economic plants collected from the Vyasi valley, district Tehri-Garhwal (U.P.), during the years 1975 to 1977. The study revealed the possibility of commercial exploitation of the available economic plants from the valley.

217. **Dixit, R.D., Dutt, A.K. & Vaish, U.S. 1987.** "Plant wealth of Experimental Garden, Central Circle, Botanical Survey of India, Allahabad". *Bull. Bot. Surv. India* 29(1-4): 43–52.

Abstract: The Experimental Garden of Botanical Surve of India, Central Circle covering an area of about 3 ha is situated near Prayag Railway Station at 10, Chatham Line, Allahabad. The garden has been divided into 10 distinct sections comprising of plant wealth of about 560 species of flowering plants and pteridophytes excluding varieties and annuals.

218. **Dixit, S.K., Roy, G.P. & Shukla, B.K. 1984b.** "A floristic survey of Fatehpur district–II (Family- Poaceae)". *J. Econ. Taxon. Bot.* 5: 107–122.

Abstract: Present study deals with full account of 52 genera and 100 species of Poaceae. *Sporobolus helvolus* (Trin.) Dur. et Schinz. is a new record and *Cenchrus pennicetiformis* Hochest. et Steud., *Tetrapogon tenellus* (Roxb.) Chiov. are rare to Uttar Pradesh.

219. **Dixit, S.K., Verma, B.K. & Roy, G.P. 1984a.** "A floristic survey of Fatehpur district, U.P.– I (excluding Poaceae)". *J. Econ. Taxon. Bot.* 5: 75–106.

Abstract: A comprehensive account of the plants of Fatehpur district (excluding Poaceae) has been presented in this paper. The plants collection was done during 1982-1983. Total 445 species belonging to 290 genera and 91 families have been enumerated.

220. **Dobhal, P., Bisht, S.L., Sawan, S., Joshi, V. & Joshi, S.P. 2010.** "Life-forms and biological spectrum of a riverine forest of the Doon valley, Uttarakhand, India". *Indian J. Forest.* 33(4): 585–598.

Abstract: Life-forms and biological spectrum of the flora of a riverine forest of Song river have been determined. The biological spectrum reveals that the vegetation of this area is thero-phanerophytic. The life-forms observed were therophytes (52.79%), phanerophytes (29.33%), chamaephytes (7.33%), cryptophytes (5.87%) and hemicryptophytes (4.68%). Results show that the percentage of the therophytes in the riverine area is nearly four times higher than those of the same life forms in the normal biological spectrum of Raunkiaers. The higher percentage of therophytes was due to the biotic disturbances like mining, grazing, browsing and lopping of trees.

221. **Dobhal, P.K., Kohli, R.K. & Batish, D.R. 2010.** "Evaluation of the impact of *Lantana camara* L. invasion on four major woody shrubs, along Nayar river of Pauri Garhwal in Uttarakhand Himalaya". *Int. J. Biodiv. & Conserv.* 2(7): 155–161.

Abstract: Situated in North-Western Himalayas, owing to large variations in the altitude and climatic zones, Pauri Garhwal possesses a rich diversity of flora and fauna. Composition and structure of vegetation of the Garhwal region is being modified due to the invasion of *Lantana camara* L. Its rapid spreading, entangling nature of canopy of many individuals of a population and allelopathic nature pose serious threat to native forest flora. Beside its natural tendency to invade, the area having sub-tropical climate integrates suitably to its luxurious growth. *Zizyphus mauritiana* Lam., *Murraya koenigii* (L.) Spreng, *Justicia adhatoda* L. and C. *opaca* Stapf ex Haines are four native shrub species found abundantly along Nayar river of Garhwal Himalaya. In this study, impact of L. *camara* invasion on these four major native shrubs was determined. Further, effort was made to correlate it with plant morphology and nutrient status of soil. Although, *L. camara* upsets importance value indices (IVI) of all four shrubs, its impact on *M. koenigii* and *J. adhatoda* was relatively more alarming, later was found to have morphologically weak structure and meager distribution in L. camara invaded localities of study area. It appeared that in comparison to other shrubs, owing to their morphology these two shrubs were subjected to greater competition against *L. camara*. The decrease in population of these major shrub species will have crucial effect on associated species and consequently on whole ecosystem.

222. **Dogra, K.S., Uniyal, S. & Kumar, A. 2019.** "Climate change issues and challenges in the Wesetrn Himalaya: Its impact on the Plant-diversity, livelihood and mitigation strategies". *J. Non-Timber Forest Prod.* 26(2): 75–80.

Abstract: Indian Western Himalaya has a rich plant diversity/bio-resources due to the large variation in the altitude (300 to 6000 ms) and climatic conditions conditions from tropical, temperate to alpine. The paper sheds light on the issues and challenges of climate change in the Western Himalaya; its impact on the plant diversity (wild plants, crops, fruits); loss of plant diversity and livelihood of the local communities; impact on the phenology of plant species; possible mitigation strategies to combat the impact of climate change. The Western Himalayan region has a rich diversity of plant diversity or bio resources. These bio resources (wild plants, crops, fruits) have been used by the local communities in the form of traditiona medicines and foods from pre-historic periods or since the settlement of human communities in this region. These communities used these bio-resources as a resource of income by their cultivation and selling in the markets. They are also involved in the traditional agriculture and horticulture practices and for that dependent on the climatic conditions (rate of precipitation, temperature, humidity) throughout the year. Hemce stable environment conditions a pre requisite for better production and productivity. But in the last 100 years an increased in the temperature on earth brought large variation in the climate of Himalayan region too. The extreme climatic conditions will make Himalayan ecosystem more fragile, less productive and more prone towards disasters or natural calamities. Long term planning is required to understand the impact of climate change in the Western Himalaya along with some new strategies to mitigate its impact.

223. **Dubey, K.P. 1997.** "Himalayan Yew *(Taxus baccata)* conservation: A vegetative approach". *Indian Forester* 123(12): 1150–1154.

Abstract: The Himalayan Yew (*Taxus baccata*) is an extremely threatened and medicinally important tree, for the use of its commercial extract Taxol, which is being used as an anti-cancer drug universely. Vegetative propagation of the plant was tried, using branch cutting 1-2 cm thick taken from Jageshwar, district Almora. The branch cuttings after given dip treatment using several growth promoting substances (IAA, IBA, Geradix and Seradix) along with control cuttings, in which no treatment was used were planted in raised platform sand beds in the Mist Chamber. The branch cuttings treated with IBA dip treatment were found to be the best method of vegetative propagation of the species. This will go a long way in the conservation of the commercially important Himalayan species of Yew, along with the preserbation of its inherent genetic characteristics.

224. **Dubey, N.K. 2004.** *Flora of BHU Campus, Banaras Hindu University*. BHU Press, Varanasi, India.

225. **Dubey, R.P. & Agarwal, R. 1978.** "Studies in the aquatic and lowlying vegetation of Allahabad". *Geobios* 5: 234–235.

Abstract: The present study was undertaken with a view to understand the aquatic and lowlying vegetation of Allahabad. A biological flower-colour spectrum was also attempted to supplement the knowledge of aquatic vegetation of this area.

226. **Dudgeon, W. 1924.** "Succession of epiphytes in the *Quercus incana* forests at Landour, Western Himalaya: A preliminary note". *J. Indian Bot. Soc.* 3: 270–272.

227. **Dudgeon, W. & Kenoyer, L.A. 1925.** "The ecology of Tehri-Garhwal– A contribution to the ecology of Western Himalaya". *J. Indian Bot. Soc.* 4: 233–285.

228. **Duthie, J.F. 1883a.** *A List of the Grasses of North-western India- Indigenous and Cultivated.* Roorkee.

229. **Duthie, J.F. 1883b.** *The Fodder Grasses of Northern India.* Roorkee.

230. **Duthie, J.F. 1885a.** Botanical tour in British Garhwal, Sept., 1885. Report on the progress and condition of the Government Botanical Gardens at Saharanpur and Mussoorie for the year ending on 31 st March, 1886. Append. 6: 25–49. Allahabad.

231. **Duthie, J.F. 1885b.** Notes on a botanical expedition to North-eastern Kumaon in 1884. Report on the progress and condition of the Government Botanical Gardens at Saharanpur and Mussoorie for the year ending on 31 st March, 1885. Append. 6: 28–51. Allahabad.

232. **Duthie, J.F. 1885c.** "Notes on some trees and shrubs observed during a recent botanical expedition to North-Eastern Kumaun". *Indian Forester* 11(1): 1–6.

233. **Duthie, J.F. 1903-1929.** *Flora of the Upper Gangetic Plain and of adjacent Siwalik and sub-Himalayan tracts.* 3 vols. Govt. Press, Calcutta. (Repr. ed. 1960. vol. 1-2. BSI, Calcutta).

234. **Duthie, J.F. 1906a.** "The Orchids of North-west Himalaya". *Ann. Roy. Bot. Gard. Calcutta* 9: 81–211.

235. **Duthie, J.F. 1906b.** *Catalogue of Plants of Kumaon and of the adjacent portions of Garhwal and Tibet based on the collections made by Strachey and Winterbottom during the year* 1846-1849– Revised and supplemented by J.F. Duthie. London. [Repr. ed., Bishen Singh Mahendra Pal Singh, Dehradun and Periodical Experts, Delhi].

236. **Dutta Pramanick, D. 2016.** "Enumeration of the genus *Ficus* L. (Moraceae) in Uttarakhand, India". *J. Econ. Taxon. Bot.* 40(1-2): 46–56.

Abstract: Twenty four species and three infra-specific taxa of *Ficus* L. (Moraceae) from Uttarakhand and enumerated with brief description, phenology, uses, role in agroforestry, habitat and distribution in India.

237. **Dutta Pramanick, D. & Srivastava, A. 2016.** "Notes on *Maclura cochinchinensis* (Lour.) Corner (Moraceae)– A less known medicinal plant with potent antioxidant and antimicrobial properties facing population depletion". *J. Non-Timber Forest Prod.* 23(1): 27–28.

Abstract: *Maclura cochinchinensis* (Lour.) Corner, commonly known as 'Manda Roti' or 'Bandar Roti', is a less known medicinal shrub possessing multifarious uses. The present communication highlights the economic and medicinal importance of the plant with special reference to conservation status. In India this species is distributed in Assam, Bihar, Odisha, Uttar Pradesh, Sikkim and Uttarakhand.

238. **Dwivedi, S.V., Anand, R.K. & Sagar, V. 2013.** "Exploration of minor and underutilized fruits of Vindhyan zone for biodiversity conservation". *J. Non-Timber Forest Prod.* 20(2): 151–153.

Abstract: Growing fruits naturally in the forest have served as food to human being for millennium and will continue to serve, until unless these fruit producing species become extinct because of the pressure of human population. Present paper describes some species and appeals for using them in fruit breeding programs.

239. **Edgeworth, M.P. 1852.** "Catalogue of plants found in Banda Dist". Reprinted from *J. Asiat. Soc. Bengal* 21: 24–28,151–184.

240. **Edgeworth, M.P. 1867.** "Florula Banda". *J. Linn. Soc. London* 9: 304–326.

241. **Fatima, N., Narain, S., Renu, Kumar, S. & Kaur, J. 2019.** "Grasses: As boon and some depreciated taxa of Uttar Pradesh". *Environm. & Ecol.* 37(3A): 863–867.

Abstract: Grasses are plants of family Poaceae and important due to their biogeographical presence as well as ecological and socio-economic importance. These are main source of food such as cereals, vegetables and are also used as medicine by poor peoples those who are unable to afford expensive medicine and they have no facilities as in modern life. Present review article is based on uses of grasses in different area of Uttar Pradesh.

242. **Fonia, K.S. 2011.** *The Devine Heritage of Shri Hemkund Sahib and the World Heritage of the Valley of Flowers.* Saraswati Press, Dehradun.

243. **Freitag, I.J. 1975.** "The genus *Piptatherum* (Gramineae) in Southwest Asia". *Notes Roy. Bot. Gard. Edinburgh* 33(3): 341–406.

244. **Gaira, K.S., Rawal, R.S., Rawat, B. & Bhatt, I.D. 2014.** "Impact of climate change on the flowering of *Rhododendron arboreum* in central Himalaya, India". *Curr. Sci.* 106(12): 1735–1738.

245. **Gairola, H. & Negi, A.S. 2011.** Van Panchayats in Uttarakhand: A perspective from practitioners. In: Gokhle, Y. & Negi, A.K. (Eds.), *Community Based Biodiversity Conservation in the Himalayas.* The Energy & Research Institute, New Delhi. Pp. 33–45.

246. **Gairola, S., Rawal, R.S. & Todaria, N.P. 2008.** "Forest vegetation patterns along an altitudinal gradient in sub-alpine zone of west Himalaya, India". *African J. Pl. Sci.* 2: 42–48.

Abstract: The present study describes vegetation diversity along an altitudinal gradient in three sites of sub-alpine forests. The altitude of the study sites ranged from 2800-3600 m asl and represented a transition from closed canopy temperate forests to open canopy sub-alpine forests. The results revealed that from low to high altitude strata, size and density of trees decline sharply. The density of sapling and seedling do not follow the trend of trees and exhibit site/location specific trends. Shrub and herb also did not exhibit uniform patterns across altitudinal range of the sites. As sub-alpine forests are considered to be potentially prone to the adverse effects of climate change, present study will provide important baseline information for future evaluation of the impact of climate change on sub-alpine forest communities.

247. **Gairola, S., Sharma, C.M., Ghildiyal, S.K. & Suyal, S. 2011.** "Tree species composition and diversity along an altitudinal gradient in moist tropical montane valley slopes of the Garhwal Himalaya, India". *Forest Sci. & Technol.* 7(3): 91–102.

Abstract: The study was conducted along an altitudinal gradient (1500 to 2850 m above sea level) in moist tropical montane valley slopes of the Mandal-Chopta area in the Garhwal region of India. Twelve forest types according to the altitude, slope aspect, and species compositions were selected for the study. The aims of the study were to describe and examine the structure and composition of the tree vegetation along an altitudinal gradient, and to compare the results of the present study with the other forests of Uttarakhand Himalaya growing at similar altitudinal range. High values of stem density and species diversity were recorded in mixed broad-leaved forest types growing between 1600 and 2400 m a.s.l., whereas forest types growing at higher altitudes (>2400 m a.s.l.) had low species richness and stem density. Tree density (tree ha^{-1}) showed positive relationship with species richness and Shannon–Wiener diversity index. Forest types growing at higher altitude (>2400 m a.s.l.) showed geometric dominance-diversity curves. The values of stem density and total basal area in most of the forest types were higher than the earlier reported values from other parts of the Uttarakhand Himalaya.

248. **Gairola, S., Sharma, C.M., Ghildiyal, S.K. & Suyal, S. 2012.** "Regeneration dynamics of dominant tree species along an altitudinal gradient in a moist temperate valley slopes of the Garhwal Himalaya". *J. Forest. Res.* 23(1): 53–63.

Abstract: The present study was undertaken in moist temperate forest of Mandal-Chopta area in the Garhwal region of Uttarakhand, India. The aim of the present study was to understand the regeneration dynamics of the dominant tree species along an altitudinal gradient in naturally regenerating, restricted access forest. The overall regeneration status was fairly high in the study area. Most of the native canopy and undercanopy dominants had frequent reproduction and expanding populations, which suggests the stability of forest structure/composition and further expansion of dominant species. The overall regeneration of trees in the forest had a greater contribution of middle and understorey species. Because of infrequent reproduction and declining populations of some of the dominant native species *viz.*, *Abies pindrow, Alnus nepalensis* and *Betula alnoides*, structural/compositional changes in the future are expected in respective forests dominated by them. *Abies pindrow* and *Taxus baccata* need immediate attention by forest managers for their survival in the area. Seedlings were found to be more prone to competition from herb and shrubs than saplings.

249. **Gairola, S., Sharma, C.M., Suyal, S. & Ghildiyal, S.K. 2011a.** "Composition and diversity of five major forest types in moist temperate climate of the Western Himalaya". *Forest. Stud. China* 13(2): 139–153.

Abstract: The present study was undertaken in five major forest types (dominated by *Quercus semecarpifolia*, *Quercus floribunda*, *Acer acuminatum*, *Abies pindrow* and *Aesculus indica*, respectively) between 2400 and 2850 m a.s.l. in a moist temperate forest of the Mandal-Chopta area in the Garhwal region of Uttarakhand, India. The aim was to assess the variation in composition and diversity in different vegetation layers, i.e., herb, shrub and tree, among these five forest types. Diversity indices, such as the Shannon-Wiener diversity index, density, total basal cover, Simpson's concentration of dominance index, Simpson's diversity index, Pielou's equitability, species richness, species heterogeneity and β-diversity, were calculated to understand community structures. Dominance-diversity curves were drawn to ascertain resource apportionment among various species in different forest types.

250. **Gairola, S., Sharma, C.M., Suyal, S. & Ghildiyal, S.K. 2011b.** "Species composition and diversity in mid-altitudinal moist temperate forests of the Western Himalaya". *J. Forest & Environm. Sci.* 27(1): 1–15.

Abstract: The present study was undertaken in middle altitudinal (1500 to 2500 masl) moist temperate forest of Mandal-Chopta area in the Garhwal region of Uttarakhand, India. The aim of the present study was to assess the variation in species composition and diversity in different vegetation layers viz. herb, shrub and tree, at different altitudes. Shannon-Wiener diversity index (H¯), Nha^{-1}, total basal cover per hectare (G), Simpson concentration of dominance, Pielou Equitability, species richness (SR), Margalef index, Menheink index of species richness and β-diversity were calculated to understand community composition. Tree G ranged from 84.25 to 35.08 m^{2}ha^{-1} and total stem density varied from 990 to 1470 Nha^{-1}. Total SR (herb, shrub and trees) among different forest types ranged between 31 and 58. Maximum G of herb and shrub layers was recorded at lower altitudes between 1500 and 1650 masl. β-diversity was higher in herb layers as compared to tree and shrub layers. Dominance-diversity curves were also drawn to ascertain resource apportionment among various species in different forest types. Values of species diversity, H¯, Nha^{-1} and G were higher in the study area as compared to similar forests growing in other parts of Uttarakhand Himalaya.

251. **Gairola, S., Sharma, C.M., Rana, C.S., Ghildyal, S.K. & Suyal, S. 2010.** "Phytodiversity (Angiospenns and Gymnospenns) in Mandal-Chopta forest of Garhwal Himalaya, Uttarakhand, India". *Nature & Sci.* 8(1): 1–17.

Abstract: The present study was undertaken in biodiversity rich moist temperate Mandal-Chopta forest of Garhwal Himalaya, Uttarakhand, India to enumerate the Phytodiversity of the area. We recorded a total of 338 species (334 Angiosperms and 4 Gymnosperms) belonging to 93 families (91 Angiosperms and 2 Gymnosperms) and 249 genera (246 Angiosperms and 3 Gymnosperms). The Dicotyledon and Monocotyledon were represented by a total of 81 and 10 families, respectively. Of the 93 families recorded, 38 were represented by single species, 16 by two species, 13 by three species and 26 with more than 3 species. Asteraceae was the dominant family with 30 species, followed by Rosaceae (24) and Lamiaceae (23). Out of 338 species recorded at the study site 178, 75, 46, 26, 10 and 3 were herbs, shrubs, trees, climbers, grasses and sedges respectively. 84.62% species had common occurrence whereas, only 15.38% species had uncommon occurrence.

252. **Gairola, Y. & Biswas, S. 2008.** "Bioprospecting in Garhwal Himalayas, Uttarakhand". *Curr. Sci.* 94(9): 1139–1143.

Abstract: The term bioprospecting has been widely used to assess the economic potential of different plant species and their value-addition. Our folklore with embedded cultural heritage has tremendous possibilities and potential for bioprospecting. Among the over 8000 species of flowering plants growing in the

Himalaya, nearly 4000 are identified from the Garhwal Himalayan region. This part of region enjoyed at significant place throughout its history. This region enriched with diverse vegetational wealth and indigenous wisdom of resource use, if subjected to bioprospecting may prove to be a boon for the society.

253. **Garbyal, S.S. 2000.** "Gregarious flowering of *Aechmanthera gossypina* (Nees) Nees in Chaudans valley, Kumaon hills of Uttar Pradesh". *Indian Forester* 126(2): 197–199.

Abstract: Gregarious flowering of *Aechmanthera gossypina* (Nees) Nees (Acanthaceae) has been observed in Chaudans valley of Pithoragarh district in the Kumaon hills of Uttar Pradesh after a gap of 12 years. This species is locally known as Kangdali.

254. **Garbyal, S.S., Aggarwal, K.K. & Babu, C.R. 2004.** "Impact of *Cordyceps sinensis* in the rural economy of interior villages of Dharchula sub-division of Kumaun Himalayas and its implications in the society". *Indian J. Tradit. Knowl.* 3(2): 182–186.

Abstract: *Cordyceps sinensis* belonging to family Clavicipitaceae is a parasitic fungus on Lepidopteran larvae. It occurs at an altitude over 4,000 m and is known to be found in Chipla, Malpa top, Njyang top, Karschila, Budhi Galja, Chal, Baling, Bon, Dugtu, Panchachuli, Nampa and Api in Dharchula Himalayas. *Cordyceps* is known to be used for many centuries as tonic, medicine, and aphrodisiac and in religious ceremonies in China, Indonesia and upper Himalayas. Since last 4-5 years *Cordyceps* has been traded very extensively in Dharchula area of Pithoragarh district in Uttaranchal. It has had tremendous impact on the rural economy of the villages in Dharchula area. Local people have been getting about Rs. 55,000-65,000 per kg, thereby improving the living conditions of many poor villagers.

255. **Garg, A. 1997.** "Apiculture, and its role in economy– A case study from Bhimtal". *J. Econ. Taxon. Bot.* 21(1): 53–65.

Abstract: Apiculture and its application in the economic upliftment of the rural and tribal people in the Kumaon region of Uttar Pradesh is discussed and possible recommendations for development and improvement of the apiary industry are suggested. The effects of seasonal variations of bee foraging behaviour and honey production is studied. A strong correlation between the honey bee pollen loads and the phenology of the ground flora has been discussed. The analysis revealed two peak periods for honey flow, one during summer and other during early winter. Implications of migratory bee keeping and its role in the tribal economy as a subsidiary source of income are discussed. A list of dominant species in the area which is preferred by the honey bees (alongwith their floral calendar) is appended for reference while organising an apiary industry.

256. **Garg, A. & Joshi, B. 2013.** "Alien invasive species of Nawabganj sanctuary in Uttar Pradesh and their impact on the wetland ecosystem". *Indian J. Forest.* 36(4): 517–522.

Abstract: The alien invasive species of Nawabgunj Bird Sanctuary in Uttar Pradesh are enumerated and their impact on the wetland ecosystem is discussed.

257. **Garg, A. & Joshi, B. 2014.** "Climate change, tree canopy and aquifer influence on wetland habitat". *J. Non-Timber Forest Prod.* 21(1): 53–62.

Abstract: Impact of climate change in response to tree canopy and aquifer on the wetlands is portrayed in terms of herbaceous flora of the Nawanganj Bird Sanctuary (NBS), Uttar Pradesh. The dicot herbs were most dominant in the wetland zones which receive ample sunlight and have sufficient moisture content suitable for seed establishment, germination and growth of plants. The sparse canopy also helps in maintaining a relatively warmer climate during winter with proper sunlight infiltration and cooler conditions during summers by allowing air currents to reach the ground zones and regulating CO_2 levels in the atmosphere, thus creating a climate ideal for birds.

258. **Garg, A. & Singh, V. 2015.** "Alien invasive elements of Upper Ganga Ramsar Site, Uttar Pradesh, India". *Indian J. Forest.* 38(4): 383–386.

Abstract: Invasive alien species of Upper Ganga Ramsar Site in Uttar Pradesh and their impact on the wetland ecosystem is discussed. In all 69 alien invasive species under 58 genera and 32 families were recorded of which there were 55 herbs, 5 climbers/twiners, 5 shrubs, 2 undershrubs and 2 trees species. The alien invasive of American origin dominated while the family Asteraceae showed maximum representation. It is inferred that stringent measures need to be adopted for combating the spread of alien invasives in order to conserve the wetland biodiversity and loss of indigenous species for habitat conservation.

259. **Garg, A. & Singh, P. 2018.** "Floristic diversity of Nawabganj Bird Sanctuary– A wetland in upper Gangetic plains of Uttar Pradesh, India". *Indian J. Forest.* 41(3): 273–284.

Abstract: This paper reports qualitative and quantitative floristic analysis of composition, diversity and nature of plants communities occurring in the Nawabganj Bird Sanctuary, Uttar Pradesh (India), based on survey, identification and quantification. The keystone plant resources are *Acacia nilotica* and *Prosopis juliflora* located in the three islands of the central pond which act as nest-site resources by the Asian openbill storks, the most dominant and regular migratory birds and integral components for sanctuary sustenance.

260. **Garg (nee Agrawal), S. 1987.** *Gentianaceae of North West Himalayas* (A Revision). International Bioscience Monograph No. 17. Today and Tomorrow's Printers and Publishers, New Delhi.

261. **Gargya, G.R., Sharma, A.K. & Vasistha, H.B. 1998.** "Phyto-sociological analysis of some sub-alpine and alpine regions of Garhwal Himalayas in relation to *Nardostachys jatamansi* DC.". *Ann. Forest.* 6(2): 213–220.

Abstract: The study deals with the phyto-sociological analysis of the Yamnotri (site I), Kedarnath (site II), and Dayyara meadows (site III) ranging from 3000 to 4500 m a.s.l. *Nardostachys jatamansi* recorded the highest value for IVI and average basal area in all the three sites. Similarly *Carex* sp. codominating in site II had also recorded a maximum density 102.5/m^2, whereas in sites I and III, *N. jatamansi* represented with the maximum density 79.75/m^2 and 73.33/m^2 respectively. *Picrorrhiza kurrooa*, an important species also recorded its presence in all the three sites. The study revealed that there was an extreme variability of plant species associated with *N. jatamansi*.

262. **Gargya, G.R., Sharma, A.K. & Vasistha, H.B. 2010.** "Study of floristic composition in alpine area of Kedamath of Garhwal Himalaya in relation to density of *Nardostachys jatamansi* DC.". *Indian J. Forest.* 33(1): 25–32.

Abstract: The present study was undertaken to understand the community behaviour of *Nardostachys jatamansi* in three different sub sites viz., maximum, moderate and minimum density levels in the alpine areas of Kedarnath region of Rudraprayag district in Uttarakhand. The results revela that the density was highest i the maximum sub site followed by in the moderate and minimum sub sites. Analysis of vegetation revealed that between different densities of community composition did not vary much. Although between various sub sites the density varied significantly between maximum, moderate and minimum categories, comparison of mean density of the area. Maximum density was represented by a total of fifteen plant species, while moderate and minimum densities showed twelve and thirteen plant species respectively.

263. **Gargya, G.R., Sharma, A.K. & Vashista, H.B. 2011a.** "Vegetation analysis in sub-alpine and alpine areas of Yamunotri of Garhwal Himalaya with special reference to density of *Nardostachys jatamansi* DC.". *Ann. Forest.* 19(1): 1–12.

Abstract: The present study was undertaken to understand the community behaviour of *Nardostachys jatamansi* in three density classes viz., maximum, moderate and minimum in sub-alpine and alpine areas of Yumunotri region of Uttarkashi district in Uttarakhand. Analysis of vegetation revealed that between different densities of *Nardostachys jatamansi*, the community composition did not vary much. Maximum density class was represented by a total of fifteen plant species, while moderate and minimum density classes showed twelve and thirteen plant species respectively. Total species density associated wit maximum, moderate and minimum density classes of *N. jatamansi* was 128.11, 128.15 and 52.95 plants/m^2. About twekve (80%) species were common in all density classes, while 6.66% species were common in two density classes and 13.32% species were observed unique in all density classes. The highest species diversity was recorded in minimum density class followed by maximum and moderate density classes of *N. jatamansi*.

264. **Gargya, G.R., Sharma, A.K. & Vasistha, H.B. 2011b.** "*Nardostachys jatamansi* DC. and its phyto-associates in different Alpine areas of Garhwal Himalaya". *J. Non-Timber Forest Prod.* 18(1): 39–46.

Abstract: The present study was undertaken to understand the population and its distribution of *Nardostachys jatamansi* in response to its associating species in three different sites of alpine region i.e. Yamunotri, Kedamath and Dayyara of Garhwal Himalaya. Vegetation analysis to determine community composition associating with *N. jatamansi* was studied using quadrat sampling method. Analysis of Vegetation revealed that the community composition of *N. jatamansi* in different sites did not vary much. Site-1 (Yamunotri) and Site-3 (Dayyara) showed If total of fifteen species each, while Site-2 (Kedamath) represented by a total of twelve plant species. Species diversity was slightly higher in Site-1 than Site-2 and Site-3. The comparative analysis of total plant density at each site versus the individual contribution of *N. jatamansi* at Site-1, Site-2 and Site-3 showed the 33.62%, 25.12% and 14.92 % contribution in total density of all species.

265. **Garkoti, S.C. 2013.** "Angiosperm diversity of Sandeo Reserve Forest, Kumaun Himalaya, Uttarakhand". *J. Econ. Taxon. Bot.* 37(3): 460–477.

Abstract: Sandeo Reserve Forest is located in the north of Pithoragarh district of kumaun region covers approximately 30 sq. km. area. An extensive floristic survey was carried out for documentation of angiosperm diversity in this reserve forest between 2002 and 2007. A total of 471 species, 346 genera and 107 families were found in this area. Poaceae, Asteraceae, Fabaceae, Orchidaceae, Lamiaceae and Rosaceae were dominant families and *Erigeron, Polygonum* and *Rubus* were the largest genera with six species each. Maximum numbe of species were found in the altitudinal zone below 1800 m.

266. **Garkoti, S.C. & Singh, S.P. 1997.** "Structure and function of herbaceous vegetation in high mountains of central Himalaya". *Trop. Ecol.* 38(1): 153–156.

267. **Garkoti, S.C., Adhikari, B.S., Rawat, Y.S. & Pande, N. 1993.** "An ecological study of epiphytic vegetation on *Quercus leucotrichophora* trees". *Advance Forest. Res. India* 9: 122–127.

268. **Gaur, A. & Misra, B.K. 2011.** "Studies in floridiversity of Unnao district (Uttar Pradesh)–I". *J. Econ. Taxon. Bot.* 35(1): 116–133.

Abstract: Besides giving an introductory profile of the district Unnao, covering its geographical location, topography and climatic conditions, the paper enumerates the outcome of the first year floristic studies into the district territories. The collections have been found to be spread over 71 families, 208 genera and 273 species of angiosperms.

269. **Gaur, R.D. 1982a.** Dynamics of vegetation of Garhwal Himalaya. In: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalayas*. Puja Publishers, New Delhi. Pp. 12–25.

270. **Gaur, R.D. 1982b.** "Resource inventory and eco-development with special reference to Garhwal Himalayas". *J. Indian Bot. Soc.* 61: 88–95.

271. **Gaur, R.D. 1987.** "A contribution to the flora of Srinagar, Garhwal". *J. Econ. Taxon. Bot.* 9(1): 31–63.

Abstract: Garhwal Himalaya constitutes the central tract of Western Himalaya in Uttar Pradesh. The famous shrines and peaks of this part, in particular, have received much attention from botanical point of view. However, the areas lying between lesser Himalaya and Shivalik ranges are poorly explored. Srinagar, the centre and old capital of Garhwal Division is an importanttown along Badrinath route, situated in an intermediate position. The present communication pertain to the flora of Srinagar and adjacent places and gives an idea of the vegetation of central part of Garhwal in all its important features. It includes an enumerates of 627 species comprising of 345 genera under 103 families of angiosperms. The little known or recently introduced plants of this region are marked with asterisk in the following text.

272. **Gaur, R.D. 1999.** *Flora of the District Garhwal, North West Himalaya (with Ethnobotanical Notes)*. Transmedia Publishers, Srinagar Garhwal, Uttaranchal.

273. **Gaur, R.D. 2007.** "Biodiversity and river valley projects in Uttarakhand". *Proc. Natl. Acad. Sci. India, Sect. B, Biol. Sci.* 77(3): 253–262.

Abstract: The present communication pertains to the complexities involved with hydroelectric projects in Uttarakhand Himalaya. To some extent, these projects serve several facilities in the overall development, but excessive disruption of water flow in the river system, coupled with other hydrological aspects and fragile geomorphic features tend to cause biodiversity loss as well as uncertainties in sustainability of the projects. Moreover, our knowledge on biodiversity of river systems is just a tip of iceberg, which has to be expanded in greater details, to deal with biodiversity aspects of the projects. The planet earth has more than 1.7 million known species. One of these, the *Homo sapiens* (man), is the most creative or destructive as well as restless in search of new technologies vis-a-vis development. The biosphere or the habitat of all living-beings is greatly influenced by the intellectual and operational capabilities of man. One of the examples of human developmental processes is construction of large hydroelectric projects, for several benefits such as power, irrigation, tourism and industrial development, etc. From biodiversity point of view, such projects are unethical as they impede the biological web of the environment, as a large hydel project leads to a complete alteration of a terrestrial habitat into an aquatic ecosystem. Such a development shows almost total loss of biodiversity from a particular water reservoir site. From human point of view, a large population is replaced, and the original land use pattern, socio-economic systems, agro-socio-forestry systems and traditional ecological practices lead to an end. Traditional crops of the area, forests, vegetation, fauna including micro-organisms show sudden disappearance. People displaced from a site adjust to new habitats, where their religio-cultural traditions, socio-economic web and occupation especially agriculture, crumble. Moreover, the sustainability of the project is doubtful as it depends on the natural geo-morphological, climatic and biotic factors, including socio-economic conditions of the affected people. In general, loss of biodiversity can not be compensated with the economic growth, and such projects aimed to overall development of populace, ever remain questionable as to their real value.

274. **Gaur, R.D. & Barthwal, B.S. 1991.** Different types of forest communities in Pauri district (Garhwal Himalaya). In: Rajwar, G.S. (Ed.), *Garhwal Himalaya-Ecology and Environment*. Ashish Publ., New Delhi. Pp. 131–147.

275. **Gaur, R.D. & Barthwal, B.S. 1995.** A contribution to the forest flora of Pauri district, Garhwal Himalaya. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent* 5: 1–135. Bishen Singh Mahendra Pal Singh, Dehradun.

276. **Gaur, R.D. & Nautiyal, S. 1980.** "Weed flora of Srinagar Garhwal". *J. Himal. Stud. Reg. Develop.* 4: 91–95.

277. **Gaur, R.D. & Semwal, J.K. 1983.** Exploitation and threat to survival of some high altitude plants in Garhwal Himalaya. In: Jain, S.K. & Rao, R.R. (Eds.), *An Assessment of Threatened Plants of India*. Botanical Survey of India, Calcutta. Pp. 37–39.

278. **Gaur, R.D., Nautiyal, S. & Chandra, P. 1982.** "Studies on weeds of *Eleusine* fields in relation to soil nature". *Indian Forester* 108(11): 708–711.

Abstract: Total 50 species of angiosperms constituted the weed flora of *Eleusine* crop in the present study. Weeds were causing mineral and salt deficiency as the Carbon,

Phosphorus and Potassium level were below normal in most of investigated soil samples. This also indicated their efficient absorption of nutrient from the soil declining productivity to the soil to the crop and probably representing greater adaptation to the weed plants in deficient nature of the soil.

279. **Gaur, R.D., Negi, K.S. & Tiwari, J.K. 1987.** "Notes on the distribution of rare and little known *Carex rostrata* Stocks from North-West Himalaya". *J. Bombay Nat. Hist. Soc.* 84(1): 263–265.

Abstract: *Carex rostrata* Stocks has been previously reported from Europe, Pakistan and Turkey and Western Himalaya (Jammu & Kashmir) in India. During a recent collection in July 1984-85 this species was collected from Khatling Glacier (Bhumka, 3200 m, Tehri district) in the North West Himalaya.

280. **Gaur, R.D., Purohit, V.P. & Silas, R.A. 1984.** "Studies on plant community structures of an Uranium belt in Garhwal Himalaya". *Indian J. Forest.* 8(3): 166–169.

Abstract: various types of minerals play an important role in the composition of a particular type of vegetation. Uranium laden soils are few and their studies in relation to plant community are still wanted. With this idea, the authors have investigated the community structure of a locality in Garhwal Himalaya, where the exploration of Uranium is in progress for the last 3-5 years. Total 62 plant species have been recorded in the uranium laden soil, of which *Bauhinia, Rhus, Mallotus, Nyctanthes, Woodfordia* and *Carissa* are found to be dominant species of the area. Only 9 species are found to be random in distribution while rest are contagious along the exploration sites.

281. **Gaur, R.D., Rawat, D.S. & Dangwal, L.R. 1993a.** "Some little known aquatic plants from Garhwal Himalaya". *J. Bombay Nat. Hist. Soc.* 90(1): 135–137.

Abstract: Six interesting and little known plants viz., *Ranunculus trichophyllus* Chaix, *Nymphaea tetragona* Georgi, *Hippuris vulgaris* L., *Monochoria vaginalis* (Burm.f.) Presl., *Alisma reniforme* Don and *Zannichellia palustris* L. has been collected from remote localities of Garhwal Himalaya. *Nymphaea tetragona* Georgi is a new report to this part of Himalaya and other plants reported here were rarely collected by previous explorers.

282. **Gaur, R.D., Rawat, D.S. & Dangwal, L.R. 1995.** "A contribution to the flora of Kuari Pass-Dalisera alpine zone in Garhwal Himalaya". *J. Econ. Taxon. Bot.* 19(1): 9–26.

Abstract: Kuari Pass-Dalisera zone situated adjacent to the south-west of 'Nanda Devi National Park and Biosphere Reserve' embodies wide stretched meadows with dense vegetation, around an altitude of 3900 m. a.s.l. On account of its remoteness as well as difficult approach, botanically earlier workers had not explored this zone. Recently it is likely to gain importance as an adventurous tourist resort, for its unparallel grandeur and lush green vegetation. Keeping in view, the present communication is an attempt to record the florictic analysis of this alpine zone, together with its adjacent sites. The dominant families of this zone are Asteraceae, Rosaceae, Ranunculaceae, Polygonaceae, Poaceae, Liliaceae and Saxifragaceae, as per their representation by number of species. Some of the rare or little known plant species of the zone are *Aquilegia pubiflora, Arnebia benthamii, Campanula modesta, Clintonia udensis, Corydalis meifolia, Cypripedium himalaicum, Delphibium densiflorum, Hippuris vulgaris, Polygonatum graminifolium, Ranunculus trichophyllus, Turritis glabra* etc.

283. **Gaur, R.D., Bisht, M.K., Tiwari, J.K. & Todaria, N.P. 1993.** "Some potential indigenous agroforestry tree species of U.P. Himalaya". *Agroforestry for Rural Development:* 714–717.

284. **Gaur, R.D., Tiwari, P., Tiwari, J.K., Rawat, D.S. & Ballabha, R. 2014.** "Bee forage potential of Garhwal Himalaya, India". *Indian J. Fundamental & Appl. Life Sci.* 4(1): 196–204.

Abstract: A total of 521 bee forage plant species belonging to 377 genera and 117 families have been documented as bee forage plants in the area. Based on the results, it can be concluded that the Garhwal Himalayan region has high potential of beekeeping in term of richness of bee foraging plant species but, yet are to be tapped. However, it is accepted that there could be other plant species of importance to the forager bees within the geographical region covered in this study. There is a need to develop adequate strategy and action plan for the conservation, management and utilization of this natural resource in the sustainable manner. Plantation of these species in gardens and barren lands from this angle need to enhance the availability of the bee forage in the area.

285. **Gaur, Tanvi & Rawat, D.S. 2013.** "Diversity, nativity, flowering phenology and invasive alien species of Asteraceae in Pantnagar". *Pantnagar J. Res.* 11(3): 409–416.

Abstract: In Pantnagar Asteraceae is represented by 68 species under 53 genera and 13 tribes. The largest tribe in the area is Heliantheae represented by 19 genera and 22 species. The low number of species in the area is due to smaller geographical area, absence of natural stands of vegetation, lack of habitat diversity and continuous disturbance in habitat. Despite of low species count, species-genera ratio and per cent contribution of Asteraceae to total flora are comparable to district floras. Non-native elements dominate the flora (47 species, 69.11%). Native elements are represented by 21 species (30.89%). Here, 27 species are American elements, 18 are 'wides', 15 are Asian, 5 are African, 1 Australian and 2 species are of unknown origin. Among 68 species, 30 are exclusively cultivated and 38 species are recorded as wild, of which 47.73% (17 species) are invasive alien species, most of which have their origin in North and South America. This high number of invasive species indicates dismal position of natural vegetation. Main flowering season is March-April but more than 70% invasive alien species flower continuously from March to December.

286. **Gaur, U.N., Raturi, G.P. & Bhatt, A.B. 2005.** "Current vegetation pattern along glacial landscape in Central (Garhwal) Himalaya, India". *J. Mountain Sci.* 2(3): 255–264.

Abstract: Current vegetation patterns, biodiversity and adaptation of plants were studied during 1998–2001 in glacial landscape of Chaurabari situated above Kedarnath (30°442 N– 79°072 E; 3,000–6,000 m) in Central Himalaya. Landscape was identified into different zones on account of the vegetation status, glacial features, geomorphology and altitudes. Cold environment with heavy snowfall, frost hailstorm and dense frost characterizes the study area. Predominance of the soda rich feldspars indicates soda enrichment; orthoclase, microcline weathering and alternation would have contributed potash to the soil. The increasing severity of the environment as we ascend from timberline to snowline leads to progressive decline in the abundance and diversity of the plant species. The diversity of the higher plants decrease, while the diversity of microflora increase from alpine zone to snowline zone. Highly opulent and diverse flora with beautiful, delicate herbs occupy the alpine zone, but some specialized groups of the plants, particularly high energetic and cold resistant species reside in glacial environment. Asteraceae, Rananculaceae, Primulaceae, Rosaceae, Apiaceae and Ericaceae are the pioneer angiospermic families, while *Anaphalis triplinervis, A. royleana, Androsacce sarmentosa, Cotoneaster rotundifolius, Lonicera myrtillus, Cassiope fastigiata, Gaultheria trichophylla* and *Erigeron multiradiatus* are the pioneer species, which have invaded in glacial environment. Through its nature, alpine glacial ecotone can be seen easily due to environmental and edaphic differences.

287. **Gautam, M.K., Tripathi, A.K. & Manhas, R.K. 2008.** "Plant diversity and structure of sub-tropical *Shorea robusta* Gaertn. f. (Sal) forests of Doon Valley, India". *Indian J. Forest.* 31(1): 127–136.

Abstract: Doon valley is famous for monocultures of moist Sal resulted due to various silvicultural operations in the past. However in recent years these forests were subjected to numerous anthropogenic perturbations, which have posed a great threat to their existence. In the present paper, we have analyzed the diversity and structure of moist Sal forests and compared them with the previous studies. After analyzing the results we found that these forests are still dominated by the Sal tree. However the structure of shrub and herb layers has been changed. These layers, once dominated by shade loving *Clerodendrum viscosum*, are now being dominated by xerophytic species like *Mallotus philippensis*, *Litsea glutinosa*, *Flacourtia indica* etc. The general diversity of tree, shrub and herb layers has increased in these forests and so is the heterogenecity.

288. **Ghildyal, B.N. 1957.** "A botanical trip to Valley of Flowers". *J. Bombay Nat. Hist. Soc.* 54(2): 365–386.

Abstract: Two eighty three species and 6 varieties belonging to 189 genera under 74 families has been recorded from Valley of Flowers. Out of this, 18 species and 3 varieties are new additions to Strachey's 'Catalogue of Kumaon and the adjacent portions of Garhwal and Tibet'.

289. **Ghildiyal, J.C. & Bebni, P.C. 2010.** "A contribution to the biodiversity of Charekh ka Danda and its adjacent area in district Pauri Garhwal, Uttarakhand (India)". *Indian Forester* 136(12): 1616–1630.

Abstract: Charekh ka Danda lies in Matiyali Range of Lansdowne forest division, situated in Dugadda block of district Pauri Garhwal in Uttarakhand (India) and is situated between 29°47'36.49" to 29°50'15.12" North latitude and 78°28' 07.67" to 78°33'32" East Longitude, at an altitude of 800m-1803m in outer Himalaya. An extensive study of the area yielded 601 plant species belonging to 145 families and 440 genera in a round the year collection. Out of the total species recorded. 453 were dicotyledons, 77 monocotyledons, 41 bryophytes, 28 pteridophytes and 2 gymnosperms. In the present study, the dominant family with 46 species was

Leguminosae (*sensu lato*) whereas, the dominant genera were *Ficus* and *Euphorbia* with 10 and 8 species respectively. Other co-dominant families of the area are Poaceae (30), Asteraceae (29), Euphorbiaceae (20), Lamiaceae (19), Acanthaceae (18), Moraceae (14), Rubiaceae (14), Amaranthaceae (13) and Rosaceae (12). Monocot - Dicot ratio of this region is 1: 5.88 and species genera ratio is 1: 1.37. The area is rich in its faunal diversity also.

290. **Ghildiyal, J.C. & Juyal, M. 2010a.** "Biodiversity of Lal Dhang forest range of Lansdowne Forest Division in Garhwal Himalaya". *Indian Forester* 136(6): 742–766.

Abstract: Lal Dhang Forest Range, the interior range of Lansdowne Forest Division is uninhabited and densely forested with rich biodiversity. The exploration of this range yielded 700 plant species belonging to 141 families and 459 genera. Out of the total species recorded, 540 were dicotyledons, 108 monocotyledons, 1 gymnosperm, 19 pteridophytes, 12 bryophytes and 20 fungi. During present study, the dominant family was Leguminosae (*sensu lato*) whereas, the dominant genera was *Ficus*. Other co-dominant families of the area were Poaceae, Asteraceae, Euphorbiaceae, Acanthaceae, Lamiaceae, Moraceae, Malvaceae, Rubiaceae and Scrophulariaceae. Monocot and dicot ratio of this region was 1:5 and species genera ratio was 1: 1.5.

291. **Ghildiyal, J.C. & Juyal, M. 2010b.** "Life forms and biological spectrum of Lal Dhang forest range of Lansdowne Forest Division in Garhwal Himalaya". *Indian J. Forest.* 33(3): 383–393.

Abstract: The biological spectrum of Lal Dhang forest range of Lansdowne Forest Division in Garhwal Himalaya reveals that the vegetation of this region is phanero-therophytic. The life forms observed are phanerophytes (42.1%), therophytes (37%), chamaephytes (11.6%), cryptophytes (7.4%) and hemicryptophytes (1.9%). The percentage of therophytes is higher in comparison to Raunkiaer's normal spectrum. The higher percentage of therophytes was due to the biotic disturbances, particularly due to human interference.

292. **Ghildiyal, J.C. & Juyal, M. 2012.** "A contribution to the biodiversity of Lansdowne Forest Division in Garhwal Himalaya". *Indian Forester* 138(5): 407–421.

Abstract: A detailed study of Lansdowne Forest Division shows that the biodiversity of the area constitutes 1402 living organisms represented by 1181 plants species and 220 faunal spp. Plants are represented by 1111 angiosperms, 4 Gymnosperm, 23 Pteridophytes, 15 Bryophytes and 29 fungi. The dominant plant family in the area is Leguminosae (*sensu lato*, 134) followed by Poaceae (102) and Asteraceae (68), the dominant genus is *Ficus* (15). Fauna of the area include 45 Mammals, 29 Reptiles, 94 birds and 52 fishes. Monocot-Dicot ratio of this region is 1:4 and species genera ratio is 1:1.7.

293. **Ghildiyal, J.C. & Lal, C. 2010.** Diversity of aquatic and semiaquatic macrophytes of Uttarkashi district, Uttarakhand. In: Uniyal, P.L., Chamola, B.P. & Semwal, D.P. (Eds.), *The Plant Wealth of Uttarakhand.* Jagadambica Publishing Co., New Delhi. Pp. 317–326.

294. **Ghildiyal, J.C. & Srivastava, M.M. 1989.** "The vegetation of Manu swamp: A tropical fresh-water swamp forest". *Indian Forester* 115(3): 183–191.

Abstract: Manu swamp of Rishikesh supports vegetation entirely different than the surroundings due to its uneven topography and different microclimatic conditions. Based on the topography and vegetation, it is divisible into swamp proper and swamp forest. The swamp proper is composed of hydrophytic, amphibious, sedge, bush and fern, cane-break and tree communities. The swamp forest is composed of trees, shrubs and herbs. Epiphytic orchids are also common in this tropical freshwater swamp forest. Its vegetation represents five strata. It differs with other swamps of Doon valley in species composition and dominance.

295. **Ghildiyal, J.C. & Srivastava, M.M. 1995.** Flora of Manu swamp: A sub-tropical freshwater swamp forest at Rishikesh (Dehra Dun), U.P. In: Gupta, B.K. (Ed.), *Higher Plants Indian Subcontinent [Indian J. Forest.,* Addl. Ser.]: 5: 159–195. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: Three hundred seventy species belonging to 275 genera under 99 families have been reported from Manu swamp. Within 370 species, 256 species are dicot, 88 monocot, 11 pteridophytes, 8 liverworts and 7 are mosses.

296. **Ghildiyal, J.C., Bisht, S. & Jadli, R. 2008a.** "A contribution to the biological diversity of Tarkeshwar sacred grove in Garhwal Himalayas". *Indian Forester* 134(6): 789–799.

Abstract: Tarkeshwar, a sacred grove in Garhwal Himalaya is situated in Tarasar Reserve Forest occupying 825.5 ha in Garhwal Forest Division out of which 314 ha is generally considered as sacred grove. The sacred grove is named on the presence of a centrally locallted 600 years old temple of Lord Shiva called Tarasar or Tarkeshwar. There are many legends and myths which are associated with this sacred grove according to the nearby villagers. In a round the year collection this sacred grove revealed 372 taxa of phanerogams and cryptogams. Out of 372 plant species, 311 were angiosperms, 4 gymnosperms, 16 pteridophytes, 15 bryophytes, 23 fungal species. Amongst angiosperms, 261 were dicotyledons belonging to 78 families and 50 were monocotyledons belonging to 10 families. The dominant family of angiosperms in the area was Asteraceae followed by Fabaceae, Lamiaceae, Acanthaceae, Rosaceae, Polygonaceae, Euphorbiaceae, Scrophulariaceae, Urticaceae, Amaranthaceae and Cucurbitaceae. The most dominant genera were *Ipomoea* and *Hypericum*.

297. **Ghildiyal, J.C., Bisht, S. & Jadli, R. 2008b.** "Life-forms and biological spectrum of Tarkeshwar sacred grove in Garhwal Himalaya". *Indian J. Forest.* 31(2): 343–356.

Abstract: Tarkeshwar a sacred grove in Garhwal Himalay, is traditionally preotected forst with its rich plant diversity. It occupies 825.5 ha. Area in Pokhra Range in Garhwal Forest Division. The biological spectrum of this sacred group reveals that the vegetation of this area is thero-phanerophytic. The life-forms observed were Phanerophytes (29.12%), Chamaephytes (13.00%), Hemicryptophytes (9.25%), Cryptophytes (6.07%), Therophytes (42.5%).

298. **Ghildyal, J.C., Bisht, S. & Jadli, R. 2010.** "A contribution to the floristic diversity of Tarkeshwar sacred grove in Garhwal Himalaya, India". *J. Econ. Taxon. Bot.* 34(2): 244–256.

Abstract: A detailed floristic study in Tarkeshwar, a sacred grove in Garhwal Himalaya revealed 366 taxa of phanerogams and cryptogams in round the year collections. Out of 366 plant species, 311 were angiosperms, 4 gymnosperms, 16 pteridophytes, 12 bryophytes and 23 fungal species. Amongst angiosperms, 261 are dicotyledons belonging to 78 families and 50 are monocotyledons belonging to 10 families. The dominant family of angiosperms in the area is Asteraceae, followed by Fabaceae, Lamiaceae, Acanthaceae, Rosaceae, Polygonaceae, Euphorbiaceae, Scrophulariaceae, Urticaceae, Amaranthaceae and Cucurbitaceae. The mst dominant genera are *Ipomoea* and *Hypericum*.

299. **Ghildyal, J.C., Jagudi, S.P., Mahra, G.S. & Pawar, R.S. 1999.** "Floristic structure of Dayara Bugyal: A high altitude pasture in district Uttarkashi of Garhwal Himalaya". *J. Nat. & Phys. Sci.* 13(2): 141–158.

300. **Ghildyal, J.C., Rajwar, G.S., Bughani, I. & Verma, R.S. 2005.** "Distribution of macrophytes in aquatic and semi-aquatic habitats of Rishikesh and surrounding area, Uttaranchal". *Indian Forester* 131(12): 1627–1633.

Abstract: A total of 61 plant species were collected from aquatic and semi-aquatic habitats of Rishikesh and surrounding area, of which 47 were angiosperms, 7 pteridophytes, 6 bryophytes and 1 alga. Amongst 47 angiosperms, 27 were dicotyledons and 20 monocotyledons. The most dominant family is Cyperaceae and the genus is *Cyperus*.

301. **Ghildyal, N. 1985.** "Nomenclatural notes on *Kobresia* Willd. (Cyperaceae)". *J. Econ. Taxon. Bot.* 7(2): 467–468.

Abstract: In the present paper, the distribution and nomenclature of *Konresia prainii* Kuekenth. and *K. Utriculata* Clarke have been discussed. The correct citation for *K. Curvata* has also been provided.

302. **Ghildyal, N. & Rawat, G.S. 1985.** "On the rarity and typification of *Carex stracheyi* Clarke (Cyperaceae)". *J. Econ. Taxon. Bot.* 7(3): 648–649.

303. **Ghildyal, S., Baduni, N.P., Khanduri, V.P. & Sharma, C.M. 1998.** "Community structure and composition of Oak forests along altitudinal gradients in Garhwal Himalaya". *Indian J. Forest.* 21(3): 242–247.

Abstract: The present study was carried out in a series of representative Oak forests within altitudinal gradients of 1400-2600 m a.s.l. in Garhwal Himalaya in relation to their analytical and synthetic characters. The highest IVI value (137.53) was reported for *Quercus floribunda*, whereas, the lowest IVI value (40.23) for *Quercus leucotrichophora* at 2300 m a.s.l. The highest sapling and sapling densities were recorded for *Quercus floribunda* (96 saplings/ha and 433 seedlings/ha respectively) at 2000 m a.s.l. The species diversity, concentration of dominance and equitability values in these forests ranged from 1.8578 (site 5) to 2.7334 (site 3); 0.1702 (site 3) to 0.3042 (site 5) and 6.60 (site 1) to 12.31 (site 2) respectively. These values are comparable with the values reported for other similar types of forests in the world.

304. **Ghora, C. & Panigrahi, G. 1986.** "A note on *Rosa hirsuta sp. nov.* and four other endemic taxa of *Rosa* L. in the Indian flora". *Bull. Bot. Surv. India* 28: 177–181.

Abstract: During our revisionary studies on the genus *Rosa* L., 31 taxa comprising 24 species and seven additional infraspecific units, are sorted out occurring indigenously or as naturalised elements within the political boundary of India. Of these, five taxa, including a new species described here, are endemic to India proper. The correct name of the taxon with reference to pertinent literature and relevant synonyms, if any, is followed by a short description with diagnostic features and citation and representative specimens studied in CAL, distributional range of taxon in India, is also indicated. *Rosa hirsuta* allied to *R. sericea* Lindl. is described and illustrated from Milam Glacier, Kumaon, Uttar Pradesh.

305. **Ginwal, H.S., Rawat, P.S., Dubey, R.C. & Singh, R.P. 1994.** "Occurrence of *Loranthus* spp. on Oak in Kumaun Himalaya". *Indian Forester* 120(3): 248–253.

Abstract: Occurrence and infection intensity of *Loranthus* spp. on four species of *Quercus* viz., Q. *Floribunda, Q. Lanuginose, Q. Leucotrichophora* and Q. *Semecarpifolia* were studied in Nainital of Kumaun Himalaya. Occurrence of the parasite was maximum in Q. *Floribunda* and minimum in Q. *Lanuginose*. In no case Q. *Semecarpifolia* was found infected. Infection was absent in seedling and sapling but manifested with increasing severity with tree age.

306. **Giri, D., Arya, D., Tamta, S. & Tewari, L.M. 2008.** "Dwindling of an endangered orchid *Dactylorhiza hatagirea* (D. Don) Soo: A case study from Tungnath alpine meadows of Garhwal Himalaya, India". *Nature & Sci.* 6(3): 6–9.

Abstract: The Central Himalayan region has been rich in biological wealth and would become an uplift resource of socio-economic status of the Himalayan people. Presence of a varied number of medicinal plants indicates its significance. Due to various levels of disturbances, destruction of number of economically important plants in these alpine meadows is continued like declining of *Dactylorhiza hatagirea* (D. Don) Soo, in its natural population. Out of six study sites, only two sites showed its presence, which indicates its declining health from natural population.

307. **Giri, G.S. & Banerjee, R.N. 1984.** "Identification and distributional note of a few species of *Epilobium* Linn. in India". *J. Bombay Nat. Hist. Soc.* 81(1): 227–228.

Abstract: The paper presents the distributional record of two newly described species namely *Epilobium gouldii* Raven & *E. squamosum* Raven and extension of distribution of *E. cylindricum* D. Don.

308. **Giri, L. 2012.** *Studies on in vitro propagation and genetic variability in Habenaria edgeworthii and H. intermedia in Uttarakhand.* Ph. D. Thesis, Kumaun University, Nainital (unpublished).

309. **Goel, A.K. 1982.** *The Herbaceous Flora of Tehri District.* Ph. D. Thesis, H.N.B. Garhwal University, Srinagar (unpublished).

310. **Goel, A.K. & Bhattacharyya, U.C. 1983.** "A review on phytogeographical aspects of herbaceous flora of Tehri Garhwal". *J. Econ. Taxon. Bot.* 4: 263–270.

Abstract: The present communication deals with the phytogeographical analysis of herbaceous flora of Tehri district in Garhwal Himalaya representing 1133 taxa of angiosperms. The detailed studies have revealed that there are about 40 percent aliens and 50 percent of the species show affinities with the east Himalayan flora. It is overall all a mixture of Cosmopolitan, Neotropical, Pantropical, Paleotropical and largely elements of Indian distribution. The representation of Eurosiberian, Eurasian, European and north temperate species also constitute a sizable flora of the district.

311. **Goel, J.P. & Singh, H. 1978.** "A catalogue of angiospermic vegetation of Roorkee in Saharanpur district, Uttar Pradesh". *Bot. Progress* 1(1&2): 20-32.

312. **Gokhale, Y. & Negi, A.K. (Eds.). 2011.** *Community Based Biodiversity Conservation in the Himalayas.* The Energy & Resource Institute, New Delhi.

313. **Gokhale, Y., Pala, N.A., Negi, A.K., Bhat, J.A. & Todaria, N.P. 2011.** "Sacred landscapes as repositories of biodiversity. A case study from the Hariyali Devi sacred landscape, Uttarakhand". *Int. J. Conserv. Sci.* 2(1): 37–44.

Abstract: The present study was carried out in the Hariyali Devi sacred landscape of Garhwal Himalaya in Uttarakhand State of India. The study area falls under the jurisdiction of the Forest Department, having the status of reserve forest. The land scope is dedicated to the deity "Hariyali Devi" and that plays a major role in conserving the biodiversity of this land scope. Taboos, rituals and socio-cultural practices are associated with conservation practices. The study recorded 98 plant species, representing 88 genera and 46 families with different economic values. The dominant family was Rosaceae, which recorded the highest (10,) number of species. Out of 98 plant species the dominant life form contribution was of herbs (52), shrubs (26) and tree species (21). Almost 82 plants species in the landscape are of medicinal importance, 15 species are used for timber and construction purposes, 19 species with different edible plant parts, such as fruits, flowers, seeds and rhizomes. The information about the uses/economic value of different plant species was gathered directly by interviewing knowledgeable elderly local villagers (including women).

314. **Govardhan, V. 1993.** *Environmental Impact Assessment of Tehri Dam.* Ashish Publishing House, New Delhi.

315. **Gupta, A., Joshi, S.P. & Gupta, B.K. 2005.** "Diversity, distribution and utilization of weed flora of wheat crop in Dehra Dun". *J. Econ. Taxon. Bot.* 29(1): 198–205.

Abstract: This paper records 71 weed species belonging to 23 families in wheat crop of Dehra Dun district. The coomon name (if any), characteristics for identification, frequency, distribution and use (if any) of each species has been provided. The study may provide a ground for sustainable utilization of weed diversity.

316. **Gupta, B.L. 1928.** *Forest flora of Chakrata, Dehradun and Saharanpur forest division, UP.* Calcutta.

317. **Gupta, D.K. 2014.** "Angiospermic diversity of Asan wetland, Doon valley (Uttarakhand), India". *Pl. Archives* 14(1): 271–275.

318. **Gupta, M. 1952.** "*Artemisia* in Garhwal". *Indian Forester* 78(8): 423–425.

319. **Gupta, N., Anthwal, A. & Bahuguna, A. 2006.** "Biodiversity of Mothronwala Swamp, Doon Valley, Uttaranchal". *J. American Sci.* 2(3): 33–40.

Abstract: India is a hub of biodiversity, encompassing a wide spectrum of habitats from tropical rain forests to alpine vegetation and from temperate forests to coastal wetlands. Among the 25 hotspots India is considered as eighth hottest of hotspots extending from Western Ghats on one side and Eastern Himalayas on the other.

India contributes significantly to this latitudinal biodiversity trend with mere 2.4% of the world's area. Wetlands are transitional zones between the terrestrial and aquatic environment. These habitats perform major ecological role in the biosphere. Many of the fossil fuels are known to be produced and preserved by the swampy environment of the carboniferous period. These are source, sinks and transformers of a multitude of chemicals, biological and genetic materials. These produce a rich collection of plants, many of which are potential for one, or more economic use these provide food, timbers, fuel, fodder and forage etc. India has a rich variety of wetlands habitats. Tropical swamp forests once formed an important part of vegetation and extended all along the base of Himalayas from Assam to Peshawar. The International Biological Program (IBP) states that: "A wetland is an area dominated by specific herbaceous macrophytes, the production of which takes place predominantly in the aerial environment above the water level while the plants are supplied with amounts of water that would be excessive for most other higher plants bearing aerial shoots". Doon valley is known for its swamps. There was a time when low lying areas of the valley were having a chain of swamps but human interference once started in the name of "Malarias Climate" still persists. The trees were cut at that time and the openings created resulted in the extinction of most of the swamps. Wetlands are one of the most productive ecosystems and thus subjected to human greed which is yet another reason for their extinction. The Mothronwala swamp is a "Hot Spot" of biodiversity due to its topographic and edaphic variations. Unfortunately these habitats have not been explored from ecological point of view. The fresh water swamp of Mothronwala is under threat due to human interference and other anthropogenic activities. The present work was carried out to explore the biodiversity of the swamp and suggest conservation and management strategies

320. **Gupta, N., Sharma, R.C. & Tripathi, A.K. 2008.** "Study of bio-physico-chemical parameters of Mothronwala swamp, Dehra Dun (Uttarakhand)". *J. Environm. Biol.* 29(3): 381–386.

Abstract: Aquatic biodiversity is one of the most essential characteristics of the aquatic ecosystem for maintaining its stability and a means of coping with any environmental change. The entire stretch of the Mothronwala swamp has rich riparian vegetation for providing conducive environment for the growth of aquatic organisms. The present work has been undertaken to study the bio-physico-chemical characteristics of the swamp. The data on physico-chemical environmental variables (temperature, total dissolved solutes, size and composition of substratum, pH, dissolved oxygen, alkalinity chlorides, and hardness) have been given under the present contribution. A total of 16 genera of aquatic insects belonging to orders Trichoptera, Coleoptera, Hemiptera, Ephemeroptera, Odonata and Phylum Mollusca represented the macroinvertebrates of Mothronwala swamp. The fresh water swamp of Mothronwala is under threat due to human interference and other anthropogenic activities. Some of the natural and anthropogenic environmental problems of the Mothronwala swamp have been identified and the ameliorative measures for the protection of aquatic environment and the conservation measures for the swamp have been suggested. The qualitative study revealed the present status of the aquatic biodiversity of the swamp and also

about the physico-chemical parameters, which would be very helpful for policy makers to take precautionary measures to save the swamp.

321. **Gupta, P.K. 1969.** "Common grasses of Gorakhpur". *Indian Forester* 95(5): 324–329.

Abstract: The paper deals with an enumeration of the grass flora of Gorakhpur. A total number of 75 species and 45 genera belonging to the 8 tribes of *Panicoideae* and 11 tribes of *Pooideae* are described. Of these 14 tribes, the tribe *Andropogoneae, Eragrosteae* and *Paniceae* dominate, having 23, 15 and 23 species respectively. *Echinochloa frumentacea* Link, *Eragrostis paeoides* P. Beauv., *E. termula* Hochst., *Setaria viridis* (Linn.) P. Beauv. and *Bothriochloa ischaemum* (Linn.) Keng described in this paper are not listed by Raizada (1954) in his list of grasses of the Upper Gangetic Plain.

322. **Gupta, R.K. 1956.** "Botanical explorations in the Bhillangana valley of the erstwhile Tehri-Garhwal state". *J. Bombay Nat. Hist. Soc.* 53(4): 581–594.

Abstract: This paper is based mainly on the observations made during trips to Masar Tal lake (10,000 ft.) and the collections from Sahsru Tal lake (16,000 ft.). The collections and observations were made in the months of May and September respectively, and have been supplemented by observations at Nainital and Mussoourie. A list of plants has been given which was collected during the visit to Masar Tal lake.

323. **Gupta, R.K. 1957.** "Botanical explorations in the Bhillangna valley of erstwhile Tehri-Garhwal state– II". *J. Bombay Nat. Hist. Soc.* 54(4): 878–886.

324. **Gupta, R.K. 1960a.** "On a botanical trip to the source of river Ganga in Tehri Garhwal Himalayas". *Indian Forester* 86(9): 547–552.

Abstract: The paper presents vegetation of the Bhagirathi Ganga valley as seen by the author during his trip. Climate, geology, soil and biotic factors have been presented in the paper. The main types of vegetation observed are (1) Tropical winter deciduous forests, (2) *Pinus roxburghii* forests, (3) *Cupressus torulosa* and *Cedrus deodara*, (4) *Cedrus deodara* forests on flood plain deposits, (5) sub alpine forests of *Betula utilis* and (6) Alpine pastures. The author feels that conifers are 'seral' communities to the oak climax that have gained dominance over the raea due to intense biotic factors and nature of the rock and soil.

325. **Gupta, R.K. 1960b.** "A preliminary survey of the vegetation of Nainital in Kumaon Himalaya". *Proc. Natl. Acad. Sci., India* 30: 16–21.

326. **Gupta, R.K. 1960c.** *Studies on the Vegetation of Northwest Himalaya*. Ph.D. Thesis, Pune University, Pune (unpublished).

327. **Gupta, R.K. 1961.** "Flora of district Muzaffarnagar in the Doab of the rivers Ganga and Yamna". *J. Bombay Nat. Hist. Soc.* 58(3): 749–775.

Abstract: In the present paper a list of plants has been given which was collected in the district Muzaffarnagar in the Doab of the rivers Ganga and Yamna. The numbers given after the plants refer to collections made by the author and plants marked with an asterisk have not been mentioned by Duthir in his flora.

328. **Gupta, R.K. 1962.** "Botanical explorations in the erstwhile Tehri Garhwal State- III". *J. Bombay Nat. Hist. Soc.* 59(2): 486–511.

Abstract: In the present paper a list of plants has been given which was collected in the erstwhile Tehri Garhwal State. Every effort has been made to adjust the nomenclature of the plants according to latest nomenclature; plants marked with as asterisk have not been described by Collett in 'Flora Simlensis'.

329. **Gupta, R.K. 1964.** "The bioclimatic types of the western Himalayas and their analogous types towards the mountain chains of the Alps and the Pyrenees. *Indian Forester* 90(8): 551–577.

Abstract: The present studies were aimed at the classification of the bioclimatic types of the western Himalayas and finding their analogous types towards west in the mountain chains till the Alps and the Pyrenees.

330. **Gupta, R.K. 1966.** "Studies in the succession of the Oak-Conifer forests of Garhwal Himalaya". *Trop. Ecol.* 7: 67–83.

331. **Gupta, R.K. 1967.** *Seasonal Flowers of the Indian Summers Resort, Mussoorie Hills.* Navyug, New Delhi.

332. **Gupta, R.K. 1968.** *Flora Nainitalensis.* Navayug, New Delhi.

333. **Gupta, R.K. 1972.** "Boreal and Arcto-alpine elements in the flora of Western Himalaya". *Vegetatio* 24(2-3): 159–175.

Abstract: The present author undertook a comparative study of the Himalayan vegetation with that of the mountain chains towards the Alps and the Pyrenees (1962) and it was noted that a number of plants from the boreal and arctic regions are present in the Western Himalaya. An account of these plants is given in this communication.

334. **Gupta, R.K. 1982b.** Mediterranean influence in the flora of western Himalaya. In: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalayas.* New Delhi. Pp. 175–193.

335. **Gupta, R.K. 1983-1989.** *The Living Himalaya* Vols. 1-11. Today & Tomorrow's Printer and Publishers, New Delhi.

336. **Gupta, R.K. 1994.** Arcto-alpine and boreal elements in the high altitude flora of North-west Himalaya. In: Pangtey, Y.P.S. & Rawal, R.S. (Eds.), *High Altitudes of the Himalaya (Biogeography, Ecology and Conservation).* Gyanodaya Prakashan, Nainital. Pp. 11–32.

337. **Gupta, R.K. 1998.** "Biodiversity protection, utilization and genetic improvement of plants having ornamental potential from Garhwal flora". *J. Econ. Taxon. Bot.* 22(2): 333–338.

Abstract: The flora of the Garhwal-Kumaon region in Western Himalayan, because of its central position, forms an important link between the western and eastern floral elements. Thus, the region is the home for a number of plants, both endemic and migrant, having ornamental potential thus has never been utilized from the view point of floriculture. Different plants having various hues and colours have either been cultivated locally or appreciated by tourists, ilgrims and scientists alike without realizing their potential for their genetic improvement, hybridization and/or selection for new cultivars. The paper focuses attention on a number of species constituting the flora having potential as ornamentals and the need for their utilization for commercial

use through hybridization and culture as community enterprise for providing employment and the need for the phytodiversity protection.

338. **Gupta, R.K. & Singh, J.S. 1962.** "Succession of vegetation types in the Tons valley of the Garhwal Himalayas". *Indian Forester* 88(4): 289–296.

Abstract: The Tons valley lies between 30°55' and 31°28' N latitude and 77°22' and 78°38' E longitude in the Garhwal Himalayas. In the present paper physical features, climate, rock and soil, forest biota and vegetation of the area are described. The vegetation has been divided into various zones according to the altitude. Ecological status of vegetation types in each zone is discussed. Oaks form the climatic climax at the lower altitudes by *Quercus incana* Roxb. and at the higher altitudes by *Quercus semecarpifolia* Smith. *Pinus roxburghii* Sarg. Forests occurring in the subtropical zone are considered to be bioedaphic in nature forming a secondary succession to the oak climax and may be considered as pre-climax or sub-climax in Clement's terminology.

339. **Gupta, R.K. & Uniyal, B.P. 1998.** "Plant diversity of Asan reservoir and its environs– A preliminary study". *Ann. Forest.* 6(1): 31–38.

Abstract: The paper provides general vegetational profile of macrophytes in and around Asan reservoir (Western Doon valley) and brief description of 39 species of algae from the study site.

340. **Gupta, S.K., Grover, S.P. & Saxena, A.P. 1980.** "Aquatic weed problems in the river Paisuni (Banda district, U.P.)". *Indian J. Forest.* 3(3): 249–254.

Abstract: A total of 34 species of aquatic weeds have been found to inhabit the river stretch surveyed. A copious supply of fine silt and organic pollutants has produced a substratum rich in nutrient which plants need for vegetative growth. Ecological conditions of the river, probable causes and effects of weed infestations have also been assessed.

341. **Gurarni, D., Arya, N., Yadava, A. & Ram, J. 2001.** "Studies on plant biodiversity of pure *Pinus roxburghii* Sarg. forest and mixed Pine-Oak forest in Uttarakhand Himalaya". *New York Sci. J.* 3(8): 1–5.

Abstract: The present study was carried out on two forest types were identified along an elevational gradient in Uttarakhand Himalaya. The dominant tree species were *Pinus roxburghii* Sarg. followed by *Quercus leucotrichophora, Rhodendron arborium, Cedrus deodara* and *Myrica esculenta. Berbaris asiatica* was the shrub present in all the forest. Tree and herb species richness, density, total basal area and diversity were high in pine-oak forest. Shrub richness was maximum in Pinus roxburghii forest and shrub density, total cover and diversity were maximum in pine-oak forest.

342. **Hajra, A., Rawat, G.S. & Tiwari, A.K. 2002.** "Population structure of the corridor forest between Rajaji and Corbett National Parks, Uttaranchal, India". *Indian J. Forest.* 25(3): 310–318.

Abstract: The population structure of the corridor forest was studied through density diameter relationships. The diameter distribution curves shows that in most cases there is an equal representation of individuals in the intermediate girth classes. In many cases the old trees with higher girth at breast height (GBH) values are seen to be

exceptionally less thus leading to the preponderance of intermediate aged stands. *Shorea robusta, Anogeissus latifolius* and, among the species under plantations, *Tectona grandis* and *Dalbergia sissoo* have very low seedling/sapling densities. *Mallotus philippensis*, which is actually an associate species of *Shorea robusta*, is gaining an increased dominance in almost all the communities and showed a good representation of individuals from the seedling level to mature trees in the corridor forests. Most of the old plantations, particularly those of *Dalbergia sissoo* had other species coming up thus indicating signs of natural regeneration and slow recovery towards mixed deciduous forest.

343. **Hajra, A., Rawat, G.S. & Tiwari, A.K. 2004.** "Economic evaluation of plant diversity in Rajaji and Corbett National Parks". *J. Econ. Taxon. Bot.* 28(4): 977–998.

Abstract: The economic evaluation of plant diversity of 300 plant species was conducted in Rajaji-Corbett National Parks. It was calculated that the maximum number of economically important species were found in the mixed deciduous forests. About 64% of the total number of plants listed had medicinal value while about 32% had fodder value. Certain conservation measures have also been suggested in order to facilitate better conservation of economically important plants.

344. **Hajra, P.K. 1983e.** Plants of Northwest Himalaya with restricted distribution– A census. In: Jain, S.K. & Rao, R.R. (Eds.), *An Assessment of Threatened Plants of India*. P. 7. Botanical Survey of India, Howrah.

345. **Hajra, P.K. & Balodi, B. 1995.** *Plant Wealth of Nanda Devi Biosphere Reserve*. Botanical Survey of India, Calcutta.

346. **Hajra, P.K. & De, A. 2010.** "Phytogeographic analysis of orchid flora in India". *J. Orchid Soc. India* 24(1-2): 43–46.

Abstract: India is rich in plant diversity. Nearly 17,500 species of flowering plants grow here in 11 different phytogeographic zones. Orchids are well represented with Eastern Himalayas and North East India, North Western Himalayas, Peninsular India and Andaman & Nicobar Islands as the major habitats in the country. The paper deals with the distribution of orchids in different region besides commenting on their affinities with orchid flora both with and outside the country (in the South Asian region).

347. **Hajra, P.K. & Rao, R.R. 1990.** "Distribution of vegetation types in North West Himalaya with brief remarks on phytogeography and floral resource conservation". *Proc. Indian Acad.* Sci. (Pl. Sci.) 100(4): 263–277.

348. **Hardwicke, T. 1799.** "Plants collected between Hardwar and Srinagar". *Asiat. Res.* 6: 309–348.

349. **Hearle, N. 1887.** "A note on the Oaks of the North-west Himalaya". *Indian Forester* 13(7): 318–319.

350. **Hole, R.S. 1911.** "Forest flora of the Siwalik and Jaunsar Forest Divisions– A review and suggestions regarding the preparation of Indian Forest Floras". *Indian Forester* 37(10): 537–552.

351. **Hooker, J.D. 1972-1897.** *The Flora of British India*. 7 Vols. L. Reeve & Co., London.

352. **Hopkins, G.M. 1930.** "Chakrata Forest Division". *Indian Forester* 56(6): 250–253.

353. **Husain, T. & Garg, A. 2004.** "*Trachycarpus takil* Becc. is not rare palm". *Curr. Sci.* 86: 633–634.

354. **Husain, T., Garg, G. & Agnihotri, P. 2010.** *Genus Pedicularis L. (Scrophulariaceae) in India.* Bishen Singh Mahendra Pal Singh, Dehradun.

355. **Husain, T., Agnihotri, P., Paliwal, A.K. & Singh, M. 2010.** Global climate change impact on species distribution in Nainital: A future challenge. In: Singh, M.P. & Paliwal, A.K. (Eds.), *Advancement in Science and Technology.* Jagdamba Publishing Co. New Delhi. Pp. 142–153.

356. **Husen, A. & Faisal, M. 2005.** "Orchid diversity and prospects of cultivation in Uttaranchal, India". *Ann. Forest.* 13(2): 275–280.

Abstract: Orchids are prized plants in domestic and international floriculture trade. The paper enumerates ornamental orchid resources of North-West Himalaya and prospect of orchid cultivation in Uttaranchal, India. Gori valley of Uttaranchal is hot spot of orchid diversity in the region and therefore, concerted efforts are needed towards their conservation. Commercialization of wild orchids will reduce pressure on forest, as most of the demand will be met through their cultivation. Ornamental orchids of Uttaranchal, especially of Garhwal and Kumaon region, their distribution and flowering are reported with emphasis on their propagation and cultivation in greenhouse.

357. **Ilyas, O. 1998.** People and Protected Area-– A case study of Binsar Wildlife Sanctuary, Almora, Report, WWF, India. Pp. 1–54.

358. **Iqbal, K., Bhat, J.A., Pala, N.A., & Negi, A.K. 2012.** "Structure and composition estimation of plant species around Khoh River of Garhwal Himalaya, India". *J. Biodiv. & Environm. Sci.* 2(9): 1–11.

Abstract: The present study was carried out along the Khoh river of Garhwal Himalaya with the aim to assess the species composition and diversity of plant species between the forest vegetation along the river and the forest, which was away from the river. Vegetational analysis was carried out by quadrat sampling method and a total of 30 quadrates along the river and 30 quadrates away from the river were laid out randomly and the size of quadrat was 10 m× 10 m. Salix tetraseprma tree species emerged as a dominant species along riverian vegetation with highest IVI (38.07) and highest density (1.03 trees/100m^2) values. The highest density values in shrubs and herb species were recorded for *Trachelospermum lucidum* and *Polygala erioptera* respectively. In the forest vegetation, located away from the river, *Toona hexandra* was found dominant species with IVI and density values 34.52 and 0.66 trees/100m2 respectively and in shrub layer, the highest density was observed for *Uraria rufescens* and in herbs the highest density was recorded for *Persicaria capitata*. Tree species diversity was observed highest along the river while the lowest tree diversity was away from the river.

359. **Iqbal, K., Bhat, J.A., Pala, N.A. & Negi, A.K. 2013.** "Physico-chemical properties of soils under the vegetation along and away of the Khoh River in Garhwal Himalaya". *Indian J. Forest.* 36(2): 205–212.

Abstract: The present study was conducted along and away from riverine vegetation of Khoh river near Duggada area of district Pauri of Garhwal Himalaya. The aim of the study was to assess the physical and chemical properties of soil. Soil samples were collected from two sites and analysed for texture, pH, organic matter, water holding capacity, soil organic carbon, phosphorus and potassium. The higher proportion of soil textute was contributed by sand>silt>clay in both the sites. Highest value of WHC was found along riverine vegetation (37.11±7.49), while lower values were obtained in vegetation away from river (25.2±3.18%). Bulk density (gcm^3) was higher in vegetation along river (0.82 gcm^3), while lower values were obtained away from riverine vegetation (o.71 gcm^3). Organic carbon percent along and away from river vegetation was 0.56% and 0.76% respectively, whereas the available phosphorus in the soil along and away from riverine vegetation was 18.19±10.16 kg/ha and 30.57±12.12 kg/ha respectively).

360. **Iqbal, K., Pala, N.A., Bhat, J.A. & Negi, A.K. 2012.** "Regeneration status of trees around Khoh River in Garhwal Himalaya". *Indian J. Forest.* 35(4): 471–476.

Abstract: This paper describes the regeneration status of trees along and away from riverian vegetation of Khoh river area of District Pauri in Garhwal Himalaya. Two sites were studied to examine regeneration status/pattern along the river and away from the river area. Seedling (1129,15 seedlings ha^{-1}), sapling (101001seedlings ha^{-1}) and tree density (660 trees ha^{-1}) were greater along the river stretch. The highest and lowest seedling density along the rivarian patch was recorded for *Salix teterasperma* (16250 seedlings ha^{-1}) and *Toona hexandra* (29.17 seedlings ha^{-1}) respectively while the highest and lowest seedling density in the area away from the river was observed for *Pyrus pashia* (106 seedlings ha^{-1}) and *Syzygium cumini* (23.33 seedlings ha^{-1}) respectively. The tree species *Terminalia alata, Bischofia javanica, Melia azedarach* and *Dalbergia sissoo* along the river and *Buchanania lanzan, Pyrus pashia*, *Lagerstromia parviflora* and *Bombax ceiba* observed away from the river were found without any regeneration. The diameter class showed decreasing trend with increase in size of girth class at both the study sites.

361. **Issar, R.K. & Uniyal, M.R. 1967.** "Orchids of Uttarakhand Himalayas". *Indian Forester* 93(10): 713–716.

Abstract: Thirty-eight orchids collected from Uttarakhand Himalaya have been identified and some of these are found to be either of medicinal or of floristic importance.

362. **Jain, R.K. 2001.** "Pollen morphological studies in some members of Acanthaceae of Doon valley". *Indian J. Forest.* 24(2): 177–184.

Abstract: Pollen morphological studies of certain Acanthaceous plant belonging to 18 species of 15 genera have been carried out. An array of pollen types are observed, they include 2-8 zonicolporate types showing different ornamentation pattern, number of colpi and nature of mesocolpium. The pollen types are categorised according to 'NPC' system of classification. Specific pollen keys are drawn in certain genera under the investigation.

363. **Jain, R.K. & Gupta, B.K. 1986.** "Taxonomic studies in the *Apluda* L. complex (Poaceae) of the Doon valley". *Indian J. Forest.* 9(4): 343–348.

Abstract: The survey and taxonomic studies on the *Apluda* complex occurring around Doon valley revealed that the complex can be divided into two species and five varieties, viz., *Apluda aristata* Linn. var. *aristata*; var. *ciliata* (Andress.) Jain, R.K. *comb. nov.*; var. *Jainii* Jain, R.K. *var. nov.*; *Apluda mutica* Linn. var. *mutica* and var. *major* (Hack.) Jain, R.K. *comb. nov.* The most reliable characters found useful in classifying the complex are hairy or glabrous spatheole and spikelets, awned or awnless sessile spikelets and to some extent the nature of lower glume of sessile spikelets and distance between the subsequent glomerules of racemes in the panicle. A key has also been provided on the basis of these characters for the identification of taxa under study.

364. **Jain, S.K. 1956.** "On a botanical trip to Nainital". *Indian Forester* 82(1): 22–38.

Abstract: In the present communication 176 plants has been collected and reported from the Nainital.

365. **Jalal, J.S. 2004.** Orchids of Lower Gori Valley, Western Himalaya: A Community Based Conservation Approach. Technical Report. WII & SDCOS, USA.

366. **Jalal, J.S. 2005.** *Systematics, Phytogeography and Habitat Ecology of Orchids in Uttaranchal.* Ph.D. Thesis, Kumaun University, Nainital, (unpublished).

367. **Jalal, J.S. 2008.** Orchid Restoration through Peoples' Involvement in Gori Valley of Western Himalaya in India, Technical Report. Wildlife Institute of India (WII), Dehradun and Rufford Foundation, UK.

368. **Jalal, J.S. 2012.** "Distribution pattern of orchids in Uttarakhand, Western Himalayas, India". *Int. J. Pl. Biol.* 3: 24–26.

Abstract: Orchids are widely distributed in tropics, subtropics and temperate regions. Within the tropics, orchids form an important feature of the vegetation, chiefly as epiphytes. India's epiphytic orchid is to be found primarily in the Eastern Himalayas and Western Ghats, while the terrestrial species flourishes in the Western Himalayas. In the state of Uttarakhand, India, orchid distribution is not homogeneous. Orchids are typically concentrated along the riverine areas and in pockets of moist forests where there is suitable habitat for their growth, development and regeneration. The purpose of this study was to provide a general review of the distribution of orchid species (epiphytic and terrestrial) in Uttarakhand. A total of 240 species (of which 10 are endemic) belonging to 73 genera were recorded. The largest number of orchid species (terrestrial and epiphytic) were encountered in the sub-tropical zone (<1500 m). Terrestrial orchids were distributed throughout the altitudinal gradient, but the largest number of species occurred in two ecotones between high and low altitude forests (1500-2000 m and 3000-3500 m). Twenty-one species were restricted to a particular habitat.

369. **Jalal, J.S. & Jayanthi, J. 2015.** "An annotated checklist of the orchids of Western Himalaya, India". *Lankesteriana* 15(1): 7–50.

Abstract: A checklist of the Orchidaceae of Western Himalaya is presented based on recent orchid explorations and herbarium collections. This checklist comprised of 239 taxa of orchids belonging to 72 genera. Of these, 130 are terrestrial, 13 mycoheterotrophic and 96 epiphytic. Thirteen (13) species are endemic to Western Himalaya. The best represented genus is *Dendrobium*, with 16 species followed by *Habenaria* with 14 species and *Bulbophyllum* with 12 species. In this checklist habit, habitat, phenology, elevational range of distribution etc. are provided.

370. **Jalal, J.S. & Rawat, G.S. 2009.** "Habitat studies for conservation of medicinal orchids of Uttarakhand, Western Himalaya". *African J. Pl. Sci.* 3(9): 200–204.

Abstract: An extensive sampling was conducted for medicinal orchids in the state of Uttarakhand between the years 2003 to 2005 covering an altitudinal range of 600–3600 m. Transects of 1 km length were laid randomly in various habitat types depending upon the geographical coverage of the habitats. Six medicinal orchid species belonging to four genera were recorded in different habitats. *Dactylorhiza hatagirea* and *Habenaria intermedia* are highly endangered in the state. A total of seven habitat types were identified where medicinal orchids were found. Among seven habitats Banj-oak habitat was found the most suitable habitat for the orchids followed by Mixed-oak and Banj Grassy Slopes.

371. **Jalal, J.S., Kumar, P. & Rawat, G.S. 2008.** "Abundance and habitat types of orchids in Gori Valley, Uttarakhand". *J. Orchid Soc. India* 22(1-2): 63–67.

Abstract: The Gori valley is located in the eastern part of the state of Uttarakhand (29Ú5'-30Ú10' N latitude and 79Ú45'-81Ú5'E longitude). This valley supports as many as 121 species of orchids out of 255 species reported from western Himalaya. Hence it can be regarded as one of the orchid hotspots in the region. Distribution and abundance of orchids were studied in this valley covering various habitats and topographic features. 84 line transect (1 km each were laid for systematic search of orchids. Along each transect orchid species and number was recorded within quadrats of 1 m^2 at an interval of 50 m and also along the line of walk. A total of 73 species (25 ground, 30 epiphytic and 18 lithophytic) of orchids were recorded. A total of 9 habitat types were identified. Maximum abundance of ground orchids were recorded within grassy slopes adjacent to Banj oak (*Quercus leucotrichophora*), whereas, alpine marsh meadows had the lowest abundance. Epiphytic orchids were most abundant in the riverine forest. A total of 59 host species were identified, of which 45.7% trees were deciduous, 3.3% deciduous shrubs, 42.3% evergreen, 5.0% evergreen shrubs and 1.6% (palm and woody climber each). Maximum species of epiphytic orchids were recorded on *Toona ciliata* (27) followed by *Engelhardtia spicata* (17), *Quercus leucotrichophora* (15), *Pinus roxburghii* (9) and *Sapium insigne* (9). Interestingly, woody climber (*Bauhinia vahlii*) and a palm (*Phoenix humilis*) also supported a number of epiphytic orchids. *Aerides multiflora, Eria pubescens, Luisia zeylanica* and *Pholidota articulata* had the maximum number of host species. This paper also deals with the major threats to the orchids in this valley and conservation implications.

372. **Jalal, J.S., Rawat, G.S. & Kumar, P. 2008a.** "An initiative to community based orchid conservation in the Gori Valley, Uttarakhand, Western Himalaya, India". *McAllen Int. Orchid Soc. J.* 9(1): 12–16.

373. **Jalal, J.S., Rawat, G.S. & Kumar, P. 2008b.** "Abundance and habitats types of orchids in Gori valley, Eastern Uttarakhand". *J. Orchid Soc. India* 22(1-2): 63–67.

Abstract: The Gori valley is located in the eastern part of the state Uttarakhand. This valley supports as many as 121 species of orchids out of 255 species reported from Western Himalaya. Hence it can be regarded as one of the orchid hotspots in the region. Distribution and abundance of orchids were studied in this valley covering various habitats and topographic features. 84 line transects (1 km each) were laid for systematic search of orchids. Along each transect orchid species and number was recorded within quadrats of 1m^2 at an interval of 50 m and also along the line of walk. A total of 73 species (25 ground, 30 epiphytic and 18 lithophytic) of orchids were recorded. A total of 9 habitat types were identified. Maximum abundance of ground orchids was recorded within grassy slopes adjacent to Banj oak (*Quercus leucotrichophora*), whereas, alpine marsh meadows had the lowest abundance. Epiphytic orchids were most abundant in the riverine forest. A total of 59 host species were identified, of which 45.7% trees were deciduous, 3.3% deciduous shrubs, 42.3% evergreen, 5.0% evergreen shrubs and 1.6% (palm and woody climber each). Maximum species of epiphytic orchids were recorded on *Toona ciliate* (27) followed by *Engelhardtia* (17), *Quercus leucotrichophora* (15), *Pinus roxburghii* (9) and *Sapium insigne* (9). Interestingly, woody climber *Bauhinia vahlii* and a palm, *Phoenix humilis* also supported a number of epiphytic orchids. *Aerides multiflora, Eria pubescens, Luisia zeylanica* and *Pholidota articulate* had the maximum number of host species. This paper also deals with the major threats to the orchids in this valley and conservation implications.

374. **Jalal, J.S., Rawat, G.S. & Kumar, P. 2010.** "Status, distribution and habitats of orchids of Uttarakhand". *J. Orchid Soc. India* 24(1-2): 35–41.

Abstract: The state of Uttarakhand occupies an area of 53,483 km^2. It harbours a wide range of eco-climatic zones ranging from tropical to alpine and a rich array of flora and fauna. As part of AICOPTAX project on orchids, the authors conducted extensive survey of orchids in various eco-climatic zones of the state during 2002-2006. The taxonomic update reveals that the state has 73 genera and 237 species of orchids. Of these, 127 are terrestrial, 99 epiphytic and 11 saprophytic. *Ponerorchis nana* (King & Pantl.) Soo is an addition to the orchid flora of the state. *Eulohia hormusjii* Duthie had earlier been mistakenly merged with other species. After a detailed scrutiny during this study, it was found to be quite distinct from others. *Androcorys pugioniformis* (Lindl. ex Hook.f.) K.Y. Lang has been rediscovered after a gap of nearly one century. It was noteworthy that several species of orchids have been collected in the state only once and some species have been reported from the cultivated source only. Several localities reported as rich in orchids have been transformed into different land use categories and most of the low-lying riverine forests have degraded rapidly since last 15-20 years.

375. **Jalal, J.S., Rawat, G.S. & Pangtey, Y.P.S. 2010.** Current status of orchids in Uttarakhand and strategies for their conservation. In: Tewari, L.M., Pangtey, Y.P.S. & Tewari, G. (Eds.), *Biodiversity Potential of the Himalaya*. Gyanodaya Prakashan, Nainital. Pp. 387–396.

Abstract: The present work is based on extensive survey and collection of orchids from Uttarakhand during 2002-2006. A total of 73 genera and 237 species have

been recorded from the Uttarakhand. 54% species of terrestrial followed by 41% epiphytic and 5% are saprophytic.

376. **Jalal, J.S., Kumar, P., Rawat, G.S. & Pangtey, Y.P.S. 2008.** "Orchidaceae, Uttarakhand, Western Himalaya, India". *Check List* 4(3): 304–320.

Abstract: A checklist of 237 species of orchids recorded from the state of Uttarakhand, India, is provided. Of these 127 are terrestrial, 99 epiphytic and 11 saprophytic. The present study shows that *Poneorchis nana* (King & Pantl.) Soo is a new record for Uttarakhand. *Bulbophyllum secundum* Hook. and *Eulophia hormusjii* Duthie that have earlier been merged into other species, during the present study after detailed scrutiny, have been treated as separate species. *Androcorys pugioniformis* (Lindl. *ex* Hook. *f.*) K.Y. Lang. has been rediscovered after a century gap. Nomenclature has been updated as far as possible with the help of available recent taxonomic literature.

377. **Johnsingh, A.J.T., Rawat, G.S., Sathyakumar, S., Karunakaran, P.Y. & Kaur, J. 1998.** Prioritization of areas for biodiversity conservation of alpine zone in the Trans and Greater Himalaya in India. In: Singh, S. &*al.*, (Eds), *Setting Biodiversity Conservation Priorities for India* 1: 212–225. WWF.

378. **Joshi, A. 1993.** "Assessment of plant species around Jhiroli magnesite area in Kumaun Himalaya". *Geobios, New Rep.* 12: 49–52.

Abstract: The present paper enumerates a total of 104 plant species around the Jhiroli mining (Almora), spread over 92 genera belonging to Bryophytes, Pteridophytes, Gymnosperms and Angiosperms. However, *Rumex hastatus, Pinus roxburghii* and *Gnaphalium hypoleucum* are recorded near the DBM plant.

379. **Joshi, A.C. & Venkatareddi, B. 1969.** "A contribution to the Flora of Varanasi district of Uttar Pradesh". *J. Scientific Res. Benaras Hindu Univ.* 18: 222–247.

380. **Joshi, A.P. 1984a.** "Ecological note on riverine forest of Garhwal Himalayas". *Indian J. Forest.* 7(2): 119–123.

Abstract: A total of 21 tree species were found in the riverine forests of Garhwal Himalayas. The important tree species were *Acacia tomentosa, Holoptelea integrifolia, Mallotus philippensis* and *Terminalia tomentosa*. The regeneration potential of the forest was not adequate except for a few tree species. Coefficient of similarity between the sites was inversely proportional to the difference of altitude between the sites. Associationship tested in between the species of the forest was found significant for 18 species pairs.

381. **Joshi, A.P. 1984b.** "Some ecological parameters of *Dendrocalamus strictus* (Roxb.) Nees in Garhwal Himalayas". *Indian J. Forest.* 7(4): 294–296.

Abstract: Density of *Dendrocalamus strictus* was found maximum on Northern slopes and minimum on southern slopes. The correlations between disfferent growth attributes and topographical features (slope inclinations and altitudes) were found negative. Correlation developed between the densities of *D. strictus* and other tree species of the forest was found significant for 6 tree species. Significantly correlated species were also subjected to the regression analysis.

382. **Joshi, A.P. & Gupta, S.K. 1982.** "The structure of the vegetation and community coefficient of certain subtropical forests of western Himalaya". *Indian J. Forest.* 5(4): 277–281.

Abstract: The Kotdwara range forest is subtropical dry deciduous forest of Garhwal Himalaya. It is dominated by *Dendrocalamus strictus, Shorea robusta* and *Lagerstroemia parviflora*. Other important trees are being *Mallotus philippensis, Adina cordifolia, Terminalia tomentosa* and *Schleichera oleosa*. The community coefficient of different slopes revealed similarity of vegetation in the slopes of same strata while it differs in the slopes of different strata.

383. **Joshi, A.P. & Gupta, S.K. 1985.** "*Mallotus philippensis* in Garhwal Himalaya: An ecological account". *Indian J. Forest.* 8(2): 134–136.

Abstract: Dry deciduous forests of Garhwal Himalaya support gregarious patches of *Mallotus philippensis*. Density and architecture of the tree was found varying with slope, slope inclination and altitude. Negative correlation existed between density, clear bole length, bole diameter, height of tree and leaf area index and slope inclination and altitude. Regeneration potential of the tree occurred adequately. Tree was found to experience heavy lopping pressure.

384. **Joshi, A.P. & Rao, N.S.V.P. 1986.** "Ecological analysis of *Shorea robusta- Pinus roxburghii* forest of Garhwal Himalaya". *Geobios* 13: 32–36.

Abstract: The *Shorea robusta-Pinus roxburghii* forest was analysed at three different altitudes. The lower and middle altitudes were dominated by *S. robusta* and the upper altitude by *P. roxburghii*. Maximum and minimum community coefficient was found in between sites 1 and 2, sites 1 and 3, respectively. There are 16 significant tree species, of which 13 were positively and 3, negatively associated. Correlation established between the densities of different tree species was found significant.

385. **Joshi, A.P., Gupta, S.K. & Purohit, B.P. 1983.** "Ecological analysis of Tarkeshwar forest of Garhwal Himalaya". *Geobios* 10: 157–161.

Abstract: Tarkeshwar forest represented a degenerated climax forest of *Qurcus incana* (Oak). There were 7 tree species with varying density on different sites *Q. incana* dominated the north-eastern slope and *Pinus roxburghii* south-western. The basin of the landslip supported *Cedrus deodara* forest. Community coefficients calculated between different communities were found higher. Six species pairs of the forest were found associated positively. Correlation established between densities of different tree species was found significant for five species pairs.

386. **Joshi, A.P., Gupta, S.K., Agrawal, A.K. & Chaudhary, A. 1986.** "Association, correlation and regression studies of forest floor of *Pinus roxburghii* Sarg. of Garhwal Himalayas". *Indian Forester* 112(5): 387–391.

Abstract: A total of 30 species were found in the forest floor of *Pinus roxburghii* Sarg. Grasses dominating over dicots, dominating species being *Eragrostis brachyphyla, E. pilosa* and *Eriophorum gracile*. Nineteen out of 30 species were found associated. The association coefficient fir significantly associated species from +0.63 to +0.98 for positive and –0.466 to –0.777 for negative associations. Densities of species

pairs correlated significantly. These species were further analysed for regression equation.

387. **Joshi, B., Panwar, G.S. & Ambrish, K. 2019.** "Seed germination and storage behaviour of *Pittosporum eriocarpum* Banks. ex Gaertn.: An endemic species of North-West Himalaya". *Indian J. Forest.* 42(3): 239–242.

Abstract: *Pterospermum eriocarpum* Banks. ex Gaertn. (Pittosporaceae) is an endemic and threatened species of the North-West Himalaya and locally known as Agni. In this study the seed viability, seed germination and storage behavious of seeds was studied and stored at different temperature. Maximum viability was reported in fresh seeds (98.21%) while the maximum germination percentage (87.11%) was observed in 6-months old seeds stored in refrigerator (polythene). Applications of Gibberelic acid has improved the seed germination (54.13%) and to overcome the morpho-physiological dormancy of the seed to an extent.

388. **Joshi, D.N. 1982.** Preliminary study of the alpine flora of Rudranath bugyal of district Chamoli (North Garhwal). In: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalayas.* Puja Publishers, New Delhi. Pp. 339–346.

389. **Joshi, G.C. 1986.** *Studies on Thistle and Legume Families of Kumaun.* Ph. D. Thesis, Kumaun University, Nainital (unpublished).

390. **Joshi, G.C. 1993.** "Notes on the vegetation types of inner Himalayan ranges of Kumaun Himalaya with special reference to herbal resources". *J. Econ. Taxon. Bot.* 17(2): 367–371.

Abstract: The paper deals with 56 species of less known wild food plants which were collected in the course of ethnobotanical survey of different parts of the country.

391. **Joshi, G.C. & Joshi, P. 2001.** Floristic diversity of Tarikhet block of Kumaun Himalaya. In: Pande, P.C. & Samant, S.S. (Eds.), *Plant Diversity of the Himalaya.* Gyanodaya Prakashan, Nainital. Pp. 221–252.

392. **Joshi, G.C. & Tewari, V.P. 2006.** "Floristic diversity and habitat of alpine meadows of Central Himalaya– A case study from Ali-Bedini meadow". *J. Econ. Taxon. Bot.* 30(3): 667–675.

Abstract: The present paper deals with 206 species, belonging to 140 genera under 37 families, from Ali-Bedini- an alpine meadow in Chamoli district of Uttaranchal. Up-to-date nomenclature has been followed. The important medicinal plants have been highlighted which are under threat and may be conserved in *in-situ* conditions. The factors related to depletion of plant resources have also been discussed with the view to develop alpine meadow management strategies.

393. **Joshi, G.C., Pande, N.K & Tiwari, D.N. 1987.** "Depleting plant resources– A case study from Kumaun Himalaya". *J. Econ. Taxon. Bot.* 11(1): 13–16.

Abstract: In the present paper a list of plants of rare occurrence in Kumaun used in indigenous system of medicines as observed in field survey of Kumaun Himalaya is given. These are excessively exploited for its commercial value for lucrative, financial gains in the trade by legal and illegal means, become depleting in many of its natural habitats because of wanton exploitation, needs protection in their wild state.

394. **Joshi, G.C., Pande, N.K & Uniyal, M.R. 1993.** "Inventory of disappearing angiosperms of Kumaun and Garhwal Himalaya– Causes and suggestions". *J. Econ. Taxon. Bot.* 17(2): 421–432.

Abstract: The present study deals with a list of 183 plants have been provided here which are on the verge of extinction giving botanical name, family, habit and their altitudinal distribution in Kumaun and Garhwal Himalaya.

395. **Joshi, G.C., Pande, P.C. & Kothyari, B.P. 1985.** "New hosts of *Dendropthoe falcata* (Linn.f.) Ettings". *Indian J. Forest.* 8(3): 235.

Abstract: *Dendropthoe falcata* (Linn.f.) Ettings semi-parasitic on *Juglans regia* Linn. var. *kumaonica* DC (from Almora), *Olea cuspidata* Wall. (from Almora) and *Populus ciliata* Wall. ex Royle (from Nainital) for the first time. There is no record of this plants growing on these plants.

396. **Joshi, G.C., Tewari, I. & Tewari, K. 2006.** "Forests and vegetation of Uttaranchal state". *J. Econ. Taxon. Bot.* 30(2): 308–322.

Abstract: The present paper deals with the forest types and vegetational composition of forest types at different altitudes and habitats. The classification is based on Champion & Seth's (1968) concept. Up-to-date nomenclature has been followed. So far, the workers have concentrated on the floral part of the region and floristic composition has been neglected which determines mutual understanding between the taxa within associations/communities.

397. **Joshi, G.C., Tiwari, K.C. & Tewari, V.P. 1995.** "Alpine environs around Kumaun and Garhwal in Central Himalaya, India with special reference to herbal resources". *Bull. Med.-Ethno-Bot. Res.* 16(3-4): 114–122.

398. **Joshi, H.B. 1971.** "A short note on production of cones by exotic Pines in U.P.". *Indian Forester* 97(9): *554–555.*

Abstract: *Pinus patula, P. montezumae, P. khasya* and *P. rudis* trees have for the first time in Uttar Pradesh produced male catkins and/or female cones.

399. **Joshi, H.B. 1973.** "Preliminary trials for introduction of *Robinia pseudo-acacia* L. in middle and outer Uttar Pradesh, Himalayas". *Indian Forester* 99(11): 663–668.

Abstract: The article gives an account of sites and trial plantations, tries to identify characteristics of sites where success have been achieved and gives outline of programme for future in extending the trial of this species which can be of real benefit to local economy.

400. **Joshi, H.C. 2002.** *Assessment of Habitat Diversity, Forest Vegetation and Human Dependence in the Buffer Zone of Nanda Devi Biosphere Reserve of West Himalaya.* Ph. D. Thesis, Kumaun University, Nainital, (unpublished).

401. **Joshi, H.C. & Samant, S.S. 2004a.** "Assessment of forest vegetation and conservation priorities of communities in part of Nanda Devi Biosphere Reserve, West Himalaya". *Int. J. Sustain. Develop. & World Ecol.* 11(3): 326–336.

Abstract: In most protected areas of the Indian Himalayan region site/habitat characteristics, community diversity and distribution pattern, vegetation composition (richness of native and endemic species), structural patterns, economic importance of forest communities and community priorities have rarely been studied. Therefore, the present study has focused on these in the buffer zone of Nanda Devi Biosphere Reserve. Seventy-six woody species (trees: 24; shrubs: 52) and 13 forest communities have been recorded between 2300–3800 m asl. Tree density ranged from 533–1220 ind ha-^{1}, tree basal area from 14.68-80.28 m^{2}ha-^{1} and shrub density from 1490–6695 ind ha-^{1}. Mean density of trees was significantly lower in temperate forests in comparison to subalpine forests. Richness of trees ranged from 3–18 and shrubs from 5–29. Species diversity (H') of trees ranged from 0.45-2.08 and shrubs from 0.90-3.14. In the temperate zone, species richness and altitude had significant positive correlations whereas in the subalpine zone the two variables were negatively correlated. The native species were high in the area (> 65% species) and in communities (>70% species), and was highest for the *Picea smithiana-Pinus wallichiana* mixed community, whereas the maximum numbers of natives and endemic species were recorded in the *Pinus wallichiana* community. The density and richness of non-natives were found to be significantly lower in comparison to the natives. Economic importance and conservation value of the communities were assessed and communities prioritized. Monitoring of the identified habitats, species, populations and communities, and development of appropriate strategies for their conservation and management are suggested.

402. **Joshi, H.C. & Samant, S.S. 2014.** "Change in structural and compositional diversity with altitude: A study from Nanda Devi Biosphere Reserve (NDBR), West Himalaya, India". *Indian J. Forest.* 37(2): 121–136.

Abstract: This paper describes the structural and compositional pattern of forest communities in the temperate and sub-alpine zones of Nanda Devi Biosphere Reserve. It gives information about 344 species belonging to 227 genera and 95 families of vascular plants recorded between 2100 to 3600 m amsl. These species include 40 trees, 64 shrubs and 240 herbaceous species distributed within 13 forest communities. It was found that the density of trees, seedlings, saplings and shrubs was higher in temperate zone than sub-alpine zone. However, density of herbs was lower in temperate zone in comparison to sub-alpine zone. This paper also gives information on distribution of native, endemic, economically important and rare-endangered species in different communities. Finally the communities and species have been prioritized for conservation.

403. **Joshi, K. & Rawat, D.S. 2011.** "A preliminary investigation on alien and native elements in the flora of Pantnagar, Uttarakhand, India". *J. Indian Bot. Soc.* 90: 66–74.

404. **Joshi, L.P. 1989.** "Exotic trees of Doon valley". *J. Econ. Taxon. Bot.* 13(2): 405–412.

Abstract: An enumeration of 55 exotic tree species naturalised in Doon valley has been presented giving common names, description and country of origin.

405. **Joshi, N.K. & Tewari, S.C. 1990.** "Phytosociological analysis along an altitudinal gradient in Garhwal Himalaya". *Indian J. Forest.* 13(4): 322–328.

406. **Joshi, P. & Narain, P. 1994.** "Vegetation characteristic and nutrient composition of underwood flora in Sal, *Eucalyptus* and Brushwood forest watersheds of Doon valley". *Indian Forester* 120(4): 331–342.

Abstract: A study on underwood vegetation of Sal (*Shorea robusta*), *Eucalyptus* and Brushwood watershed in Doon valley revealed that Sal had more underwood species (31), followed by *Eucalyptus* (16) and Brushwood (14). Quotient of similarity values (Sorensen) of ground flora were 46.8% and 35.5% for coppiced *Eucalyptus* and Brushwood watersheds respectively as compared with 100% for Sal watersheds while the Brushwood ground flora revealed 60% value in comparison to *Eucalyptus* 100%. Maximum density of ground flora was found in coppiced (210000 ha^{-1}) followed by Brushwwod (105000 ha^{-1}) than in Sal forest (83958 ha^{-1}). Though the diversity was maximum in the Sal underwood flora, the concentration of dominance was maximum in Coppiced *Eucalyptus* and minimum in Sal flora. Higher phosphorus content was observed in these species under Sal than in *Eucalyptus* and Brushwood watershed, which is explained by neutral soil environments under Sal forest.

407. **Joshi, P., Joshi, S.P. & Jain, R.K. 2015.** "Diversity, distribution, habitat preference and conservation of the fern flora of Tungnath and adjoining areas, Rudraprayag district, Garhwal Himalayas, Uttarakhand". *Indian J. Forest.* 38(2): 187–194.

Abstract: The present study is based on exhaustive collection and enlisting of 139 species of ferns occurring at Tungnath and 20 other adjoining localities ranging from 1000-4000 m altitude. It is an important part of Kedarnath Wildlife Sanctuary (also known as the largest Protected Area in Western Himalayas) situated in Rudraprayag district of Garhwal Himalayas. The entire area from Rudraprayag and Tungnath is provided with unique ecological sites that favours the occurrence of great many ferns over here and quite many species are of rare status. Chandra (1979) mentioned 71 species, Joshi *et al* since 2002 revealed the occurrence of 64 species from the area. The recent collections of pteridophytes carried out during 2011-2012, based on which the diversity and distribution patterns, habitat preference, altitudinal distribution, rarity, ecological sites and conservation status are worked out.

408. **Joshi, S.C. 2004.** *Uttaranchal: Environment and Development.* Delhi.

409. **Joshi, V. 2010.** Less known food crop diversity in Uttarakhand Himalaya. In: Uniyal, P.L., Chamola, B.P. & Semwal, D.P. (Eds.), *The Plant Wealth of Uttarakhand.* Jagadambica Publishing Co., New Delhi. Pp. 395–412.

410. **Joshi, V. 2013.** Systematic Studies on the Angiosperm Flora of Jaunsar Bawar, Dehradun. Ph.D. Thesis. H.N.B. Garhwal University, Srinagar. (Unpublished).

411. **Joshi, V. & Joshi, S.P. 2011.** "Floristic diversity in *Pyrus malus* L. orchards in Chakrata". *Indian J. Forest.* 34(3): 311–316.

Abstract: The present paper is a result of exploration of wild species distributed in *Pyrus malus* L. orchard of the Chakrata Forest Division, Uttarakhand. In orchards, out of 179 species which have been listed, of them 161 belong to dicotyledons of 53 families and 16 belongs to monocotyledons of 6 families. Gymnosperms are also distributed within 2 species of 1 family.

412. **Joshi, V., Joshi, S.P. & Chand, S. 2008.** "Diversity of seed plants in Deoghar Forest Range, Chakrata Forest Division, Dehra Dun". *Indian Forester* 134(11): 1539–1242.

Abstract: The present study was the documentation of the species diversity of seed plants of Deoghat Forest Range, Chakrata. This work is based on the plant specimen collected at monthly interval over a one year period. The study reveals that the vegetation of Deoghar Forest Range, Chakrata is moist temperate forest type in general. Dry Temperate Forest Type in selected localities is also common. The forests of Deoghar Range are rich in species diversity. The most dominant families are Asteraceae, Lamiaceae and fabaceae represented by 12, 12 and 12 species respectively.

413. **Joshi, V., Joshi, S.P. & Chand, S. 2012.** "A contribution to the flora and vegetation of Jaunsar-Bawar, Uttarakhand, India". *Indian Forester* 138: 266–283.

Abstract: The present paper is a result of exploration of entire Jaunsar-Bawar Chakrata, Dehra Dun, Uttarakhand. In all 706 plants have been listed. Of these 583 belongs to dicotyledons and 123 to the monocotyledons. The dicotyledons are distributed with 107 families and 371 genera. While monocotyledons are distributed with 14 families and 81 genera.

414. **Kachroo, P. 1993.** Plant diversity in Northwest Himalaya– A preliminary survey. In: Dhar, U. (Ed.) *Himalayan Biodiversity: Conservation Strategies*. G.B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora. Pp. 111–132.

415. **Kala, C.P. 1998.** Ecology and Conservation of Alpine Meadows in the Valley of Flowers National Park, Garhwal Himalaya. Ph.D. Thesis. Forest Research Institute (FRI). Deemed University, Dehradun. (unpublished).

416. **Kala, C.P. 1999a.** "The Valley of Flowers: A Botanical Paradise". *Plant Talk* 19: 26–28.

417. **Kala, C.P. 1999b.** "Phenology of alpine plants in the Valley of Flowers National Park and Hemkund, Western Himalaya". *Indian Forester* 125(6): 581–590.

Abstract: Phenology of the Alpine plants was studied in the sub-alpine zone of the Valley of Flowers National Park and Hemkund, located in the Western Himalayas. Transects were laid in both the areas and monitored for phenology at every 30 days interval. A total of 95 flowering plant species were found on the transects, of which 84% were forbs, 14% were evergreen shrubs and undershrubs, and remaining 2% were grasses and sedges. The vegetative phase peaked in June and from the same month flowering phase also increased in the valley. July and August were the best months for flowering. The prominent vegetative phase peaked earlier (in June) in the cushion forming forbs tha the other forms. The growing season was longest at lower altitudes and decreased with increasing altitude from sub-alpine forest to alpine meadows.

418. **Kala, C.P. 2006.** "Plant community composition and species diversity in the alpine meadows of Uttaranchal Himalayas". *Indian Forester* 132(2): 156–164.

Abstract: The alpine meadows of the Uttaranchal Himalayas are well known for rich floral and faunal diversity. In order to study the alpine meadows of Uttaranchal Himalayas, the Valley of Flowers National Park (VOF; protected from livestock grazing) and the Khiron Valley (seasonally grazed by livestock) were selected. This paper reports plant community composition and species diversity in the VOF and Khiron Valley using stratified random quadrats of 0.25 m^2. TWINSPAN was used for identifying the plant communities and Shannon Wiener Index (H') was used for species diversity. The central valley portion in the VOF that falls between 3300-3700 m elevations obtained 9 plant communities whereas Khiron Valley, located at similar elevation, obtained only 7 plant communities. In VOF, species diversity was higher (H'= 2.93) than the Khiron Valley (H'= 2.27). Plant species diversity decreased with elevation in both protected and unprotected alpine meadows. The results are discussed along with the management implications.

419. **Kala, C.P. & Rawat, G.S. 2004.** "Floral diversity and species richness in the Valley of Flowers National Park, Western Himalaya". *J. Econ. Taxon. Bot.* 28(1): 43–51.

Abstract: The paper deals with the floral diversity and species richness in the Valley of Flowers National Park, located at Chamoli district of Western Himalaya. Extensive systematic survey was conducted covering various eco-climatic zones, landscape units andseasons during 1993-1997. A total of 520 species of vascular plants, distributed over 72 families and 248 genera, were found within the National Park. Fifty nine species were recorded for the first time from the Valley of Flowers, of which 4 species are new records for the Uttar Pradesh Himalaya. Asteraceae was the largest family followed by Rosaceae and Ranunculaceae in the park area. The diversity and richness of plant species decrease with the increase in altitude from sub-alpine to higher alpine zone. The results of floral inventory and systematic study of floral diversity have been discussed.

420. **Kala, C.P. & Shrivastava, R.J. 2004.** "Successional changes in Himalayan alpine vegetation: Two decades after removal of livestock grazing". *Weed Technol.* 18: 1210–1212.

Abstract: In India's Valley of Flowers National Park, the density of the Himalayan knotweed differed significantly between stable and unstable habitats. Manual removal of this aggressive and colonizer species will be counterproductive, resulting in replacement by another colonizer, balsam. Eradication of the Himalayan knotweed is also not recommended because it will initiate land instability and hinder the establishment of natural plant communities.

421. **Kala, C.P., Singh, S.K. & Rawat, G.S. 2002.** "Effects of sheep and goat grazing on the species diversity in the alpine meadows of Western Himalaya". *Environmentalist* 22: 183–189.

422. **Kala, C.P., Rao, K.S., Maikhuri, R.K. & Negi, K.S. 2003.** "Comparative assessment of the Valley of Flowers National park and its adjacent areas in Chamoli district of Uttaranchal". *Indian Forester* 129(9): 1085–1089.

Abstract: Ex exploration trip was carried out in the Valley of Flowers National Park and its adjacent areas. The purposes of this study was to monitor the change in biodiversity over the years and collection of germplasm for long-term conservation.

423. **Kala, S.P. & Gaur, R.D. 1982.** Contribution to the flora of Gopeshwar (Chamoli Garhwal), U.P. In: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalaya.* Puja Publishers, New Delhi. Pp. 347–413.

424. **Kalakoti, B.S. 1983.** *Flora of Nainital Hills.* Ph.D. Thesis. Kumaun University, Nainital. (unpublished).

425. **Kalakoti, B.S. 2001.** Nainital hill- A transitional zone for tropical, temperate and alpine plants and medicinal value in pharmaceuticals. In: Pande, P.C. & Samant, S.S. (Eds.), *Plant Diversity of the Himalaya*. Gyanodaya Prakashan, Nainital. Pp. 583–591.

426. **Kalakoti, B.S., Pangtey, Y.P.S. & Saxena, A.K. 1986.** "Quantitative analysis of high altitude vegetation of Kumaun Himalaya". *J. Indian Bot. Soc.* 65: 384–396.

427. **Kaliyathan, N.N., Sharma, A.K., Verma, A.K. & Singh, A. 2016.** "Species distribution modelling of *Berginia ciliata* in mussoorie range of lesser Himalayas". *Ann. Forest.* 24(2): 149–158.

Abstract: The Himalayan landscapes are home to some of the most threatened medicinal herbs. *Berginia ciliata* of Saxifragaceae is one of such species, known for its diuretic and antirolithik properties. It is threatened due to habitat loss and unsustainable extraction. The exponential increase in unsustainable utilization, unorganised markets are together local extirpation of several herbs and also leading to range contraction of species from this region. As pre-requisite for conservation and management planning, species distribution modelling has been attempted in the Mussoorie landscape using Maximum Entropy method. Species presence location collected from field survey has been used to predict the distribution of *B. ciliata*. Environmental variables such as bioclimatic and topographic has been used for predicting the distribution. The study area has been classified into four categories i.e. high potential, good potential, moderate potential and least potential.

428. **Kandari, O.P. & Gusain, O.P. (Eds.) 2001.** *Garhwal Himalaya: Nature, Culture and Society*. Transmedia, Srinagar.

429. **Kandwal, M.K. 2007.** *Revision of the Family Poaceae of Garhwal Himalaya*. Ph.D. Thesis. H.N.B. Garhwal University, Srinagar. (unpublished).

430. **Kandwal, M.K. & Gupta, B.K. 2009.** "An update on grass flora of Uttarakhand". *Indian J. Forest.* 32(4): 657–668.

Abstract: 129 genera and 475 species of grasses have been listed from Uttarakhand on the basis of literature and specimens preserved in DD, BSD, LWG, BSA, CAL besides herbaria of D.A.V. College, Dehra Dun, GUH, Srinagar, Garhwal, KUH, Nainital, GBPHRI, Almora, CDRI and CIMAP, Lucknow.

431. **Kandwal, M.K., Joshi, S.P., Manhas, R.K. & Singh, L. 2007.** "Seasonal variation in community structure and invasion of aliens in a fresh water swamp at Golatappar, Dehra Dun, India". *Ann. Forest.* 15(1): 47–61.

Abstract: Phytosociological studies were carried out in winter, spring and summer seasons to analyze the change in community structure and invasion of aliens in a freshwater swamp at Golatappar, Dehra Dun, India. The site was divided into five communities (C_1, C_2, C_3, C_4 and C_5) along the moisture gradient from mesic (C_1) to xeric (C_5) conditions. The result of these studies reveal that the indigenous plant species like, *Rorippa nasturtium-aquaticum, Calamus tenuis, Limnophila hypericifolia, Diospyros malabaricum* and *Oplismenis composites*, dominated the five communities. However, a number of aliens like *Ageratum conyzoides, Eupatorium conyzoides, Adenostemma lavenia* etc. with 3.53% to 31.93% contribution also inhabited these communities. The dominance of aliens was negatively associated with soil moisture, which means that

they will dominate the swamp as soon as soil moisture decreases. The value of richness and species diversity (H') show that C_5 was the most diverse community and C_1 least diverse. C_2 community was most evenly distributed in winter and spring seasons whereas C_4 community in summer season. Dominance-Diversity (D-D) curve were plotted to show resource apportionment among different species within a community. D-D curves of the five communities in winter, spring and summer seasons revealed that C_1 community followed geometric distribution in all the seasons, C_3 and C_4 community followed log series distribution in winter and spring seasons respectively and the rest of the communities followed log normal distribution in all the seasons.

432. **Kanjilal, P.C. 1933.** *A Forest Flora for Pilibhit, Oudh, Gorkhpur and Bundelkhand.* Narendra Publication House, Delhi. (Repr. ed. 1982). 427 pp.

433. **Kanjilal, P.C. 1966.** *A Forest Flora for the Plains of Uttar Pradesh,* Part II & III. Lucknow.

434. **Kanjilal, U. 1901.** "Swamp forests of Dehra Dun, N.W. P.". *Indian Forester* 27(5): 228-230.

435. **Kanjilal, U. 1928.** *Forest Flora of the Chakrata, Dehradun and Saharanpur Forest Divisions, United Provinces.* [Revised edition by B.L. Gupta]. Delhi.

436. **Kanodia, K.C., Trivedi, B.K. & Shankar, V. 1983.** "Grazing resources of Bundelkhand region 1. Plant communities of village grazing lands in Mehroni Tehsil, Lalitpur district (Uttar Pradesh)". *Indian J. Forest.* 6(1): 32–42.

Abstract: The present study is an ecological observation of 32 village grazing lands of Mehroni tehsil. On the basis of total sum of dominance index 12 herbaceous plant communities were recognised, and in these five communities annual grasses. *Eragrostis pilosa* (L.) P. Beauv. and *E. viscosa* (Retz.) Trin. were dominant and is rest perennial grasses, i.e. *Heteropogon contortus* (L.) P. Beauv., *Iseilema laxum* Hack., *Bothriochloa pertusa* (L.) A. Camus were the dominant grasses. Total 80 species were encountered out of which eight were perennial grasses, 23 annual grasses, 11 legumes, 26 forbs and 12 bushes and shrubs.

437. **Kapil, R., Thakur, I.K. & Chona, M.K. 1992.** "Ecological studies of lithophytic plants in Srinagar valley". *Geobios, New Rep.* 12: 56–58.

Abstract: The present investigation revealed that in Garhwal valley, a total of 71 lithophytic plant species of 35 families are present. Maximum number of species preferred to grow on loamy soils, followed by sandy loam, clay and sandy loam.

438. **Kapoor, S.L. 1962a.** "On the botany of Lucknow district". *J. Bombay Nat. Hist. Soc.* 59(3): 862–896.

Abstract: The present paper a revision of Anderson's work (1859) on the flora of Lucknow district, Uttar Pradesh, and gives a comprehensive list of the plants of the district, both wild as well as commonly cultivated. In all 914 species have been recorded, of which 391 are additions to Anderson's catalogue. Salient notes on the location and topography of the district, soil, factors influencing the vegetation, and vegetation in general have also been given.

439. **Kapoor, S.L. 1962b.** "Observations on the flora of Agra district with some new records". *J. Bombay Nat. Hist. Soc.* 59(3): 976–982.

Abstract: In this communication the plants are recorded from the interesting localities of Kitham and Kailash of Agra district. Coom weds are also collected from the important parks and gardens of Agra city. Eighteen new species has been recorded from this area.

440. **Kapur, S.K. & Singh, V. 1996.** "Promising oil seed bearing plants of North-West Himalayas". *J. Econ. Taxon. Bot.* 20(1): 115–118.

Abstract: The paper identifies 51 oil seed bearing tree and shrub species. The seeds contain fatty acid are commonly found in the North-West Himalayan region. Their botanical name, family, local name, fruiting period and fatty oil contents are appended with each taxa.

441. **Kar, R., Ranhotra, P.S., Bhattacharyya, A. & Sekar, B. 2002.** "Vegetation vis-a-vis climate and glacial fluctuation of the Gangotri Glacier since last 2000 years". *Curr. Sci.* 82: 347–351.

442. **Kaur, M., Bakshi, M., Bhardwaj, R. & Verma, N. 2019.** "Soil and air pollutant loads on plants from a cement factory in Haridwar district, Uttarakhand". *Indian J. Forest.* 42(3): 263–271.

Abstract: The air and soil quality in the vicinity of cement industry influences the soil properties and distribution pattern of plants. Sensitive plant species are abolished from such areas, however, only pollution tolerant species survive under stress conditions. In this study, the potentially toxic metal pollution in soil and Air Pollution Tolerance Index (APTI) of plants occurring bearby cement industry, Bhagwanpur (Haridwar) were evaluated. Four biochemical parameters such as leaf relative water content (RWC), ascorbic acid (AA) content, total leaf chlorophyll (TCh) and leaf extract pH were used to develop an APTI. It was found that the soil in the vicinity of cement industry was having high concentrations of potentially toxic metals in comparison to control but within the permissible limits as per international standards. Twenty four plant species growing near a cement factory, an air pollution point source, were collected and analysed for APTI. The APTI was found in the range of 10.68 to 43.50. *Cyperus rotundus* and *Cynodon dactylon* were found to be having high APTI. The results highlighted the nned for regular monitoring of potentially toxic metals in soils and APTI measurements to be conducted throughout the growing season.

443. **Kaur, U. & Gupta, B.K. 1993.** Preliminary studies on the wall flora of Dehra Dun and its suburbs. In: Gupta, B.K. (Ed.), Higher Plants of Indian Subcontinent [*Indian J. Forest.*, Addl. Ser.] 4: 281–311. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: Two hundred thirteen species belonging to 175 genera under 59 families were recorded from the dilapilated walls and buildings in Dehra Dun and its suburbs.

444. **Kenoyer, L.A. 1921.** "Forest formations and successions in the Sat Jal valley, Kumaon Himalayas". *J. Indian Bot. Soc.* 2: 236–258.

445. **Khali, M. & Bhatt, V.P. 2014.** "Community structure of montane forest along the altitudinal gradient in Garhwal Himalaya, India". *J. Ecol. & Nat. Environm.* 6(6): 205–214.

Abstract: The present study was done in sub-tropical and temperate Himalayan Forest of Saikot Reserve Forest, Kedarnath Forest Division in Chamoli district of Uttarakhand

to understand the community structure and effect of altitudinal variation on structure and composition of the vegetation and to record the floristic diversity of the plants in the study area. The study area was categorised into four forest types on the basis of vegetation analysis, plant association or plant composition surveys, viz., (1) Chir-Pine forest, (2) Pine-Oak forest, (3) Oak-Pine forest, (4) Oak-mixed forest. In the floristic study, a total of 58 species were recorded. Of the 58 plant species, 21 were tree, 11 shrubs and 26 herbs. The *Quercus leucotrichophora* forest was experiencing serious threat owing to human pressure and severe invasion of *Pinus roxburghii* which leads to loss of oak forest and development of pine forest.

446. **Khan, A.A. 2002.** "The grasses of Bijnaur district, Uttar Pradesh". *J. Econ. Taxon. Bot.* 26(1): 42–48.

Abstract: This paper deals with grasses of Bijnor district. A total of 53 genera and 77 species are recorded herein.

447. **Khan, A.A. 2005.** "Herbaceous angiospermous species diversity of *Khadar* ecosystem of Bijnor – I". *J. Econ. Taxon. Bot.* 29(4): 805–814.

Abstract: This communication documents the herbaceous angiospermic species diversity of a unique and fragile *khaddar* ecosystem of Bijnor district of western Uttar Pradesh. A total of 125 species belonging to 88 genera and 35 families are reported.

448. **Khan, A.A. 2008.** "Herbaceous angiospermous species diversity of *Khadar* ecosystem of Bijnor – II". *J. Econ. Taxon. Bot.* 32(1): 4–18.

Abstract: In second part of this communication 162 species of flowering plants belonging to 114 genera and 77 families, from Campanulaceae to Cyperaceae, are reported. General statistics of the flora is given. Threats faced by this fragile and species rich ecosystems are also discussed in brief. The first part of this paper has been published in vol. 29(4) of this journal.

449. **Khan, A.A., Agrawal, S. & Khan, A. 2009.** "The grasses of Hastinapur Wildlife Sanctuary, Uttar Pradesh (India)". *J. Econ. Taxon. Bot.* 33(3): 574–584.

Abstract: Present communication documents the grass flora of Hastinapur Wildlife Sanctuary, Uttar Pradesh, India. A total of 109 species belonging to 61 genera are reported. *Eragrostis* Wolf is the largest genus represented by 12 species. Comparison with an earlier published work revealed a change in species composition over last fifty years. Twenty grass species collected during present work were not reported earlier and thirty five species reported earlier were not collected during present study.

450. **Khan, A.A., Khan, A. & Agrawal, S. 2009.** "Asteraceous flora of Hastinapur Wildlife Sanctuary, Uttar Pradesh (India)". *J. Econ. Taxon. Bot.* 33(4): 786–796.

Abstract: This paper records fifty nine species belonging to forty two genera of family Asteraceae, collected from Hastinapur Wildlife Sanctaury. A comparison with an earlier published works revealed that twenty one species were not recorded previously from the study area and seven species recorded earlier could not be collected during the present study. Among the species recorded, *Eupatorium denophorum* nd *Parthenium hysterophorus* are known invasives, while further studies are needed to determine the invasive potential of *Enhydra fluctuans* and *Soliva anthemifolia*.

451. **Khan, A.H. & Arya, D. 2017.** "Analysis of forest vegetation in Binsar Wildlife Sanctuary, Kumaun Himalaya, Uttarakhand, India". *Int. J. Bot. Stud.* 2(3): 34–39.

Abstract: Forest vegetation and regeneration were studied along different aspects and altitudinal gradient in Binsar wildlife sanctuary Almora district of Uttarakhand Himalaya (India) using standard phytosociological random sampling quadrat method. A total of six stands were laid. The result reveals that the along different altitudes and aspects a total of ten tree species were recorded. Across the stands, the total tree density ranged between 300-560 Ind/ha, sapling density between 20 to 380 Ind/ha and seedling density from 640 to1880 Ind/ha. The shrub density varied from 540 to 8520 Ind/ha. *Pinus roxburghii* was the dominant species on western, southern, eastern and western facing aspects with IVI 135.32, 218.41, 214.63 and 167.06 respectively. While *Lyonia ovalifolia* and *Quercus leucotrichophora* were the most dominant species on the northern and eastern facing aspects respectively. Across the stands, total basal area and diversity of tree layer ranged from 26.66-117.41 m^2/ha and 0.45-1.57 respectively. The regeneration of *Pinus roxburghii* and *Myrica esculenta* was excellent. The *Pinus roxburghii* was shown good regeneration even in northern and eastern facing aspects. The occurrence and increasing regeneration of *Pinus roxburghii* in these aspects might be due to global warming as this species requires warm and drier slopes for growth. Whereas the *Quercus leucotrichophora* had a complete absence of complete absence of saplings and decrease of young tree classes, but greater proportion of individuals in seedling class, indicates that seedlings from recent past had failed to attain sapling class, if the trend continues; the populations of species will decrease in near future.

452. **Khan, M.R., Srivastava, R.J., Khan, S.A., Balachandran, R. & Kumar, A. 2004.** "Studies on efficacy of pre-seed treatments on germination and growth behaviour of *Abrus precatorius*– An important medicinal plant of Uttar Pradesh". *J. Non-Timber Forest Prod.* 11(4): 268–270.

Abstract: The study on germination and growth behaviour of *Abrus precatorius* an important medicinal plant, was carried out at Forest Research Institute, Kanpur, during the year 2001-2002. It is revealed from the result finding that pre-seed treatment proved significantly superior over control in respect of germination and growth. Among the various pre-seed treatments tested, mechanical scarification of seed followed by over night soaking in water proved superior over all treatments.

453. **Khanduri, A., Biswas, S. & Vasistha, H.B. 2017.** "Forest invasive species assessment study in different village forests of Garhwal Himalayan". *Int. J. Curr. Res. Rev.* 9(17): 8–18.

Abstract: Forest invasive species (FIS) are exotic/alien species that occur outside their natural adapted ranges and dispersal potential. Some of the alien species become invasive, when they are introduced deliberately or unintentionally outside their natural habitats into new areas, where they express the capability to establish, invade and outcompete native species. The present study is focuses over the encroachment of invasive species in the two different forest communities of the Tehri Garhwal region of Western Himalaya. Data was collected through extensive field survey and quadrat method. High invasion was recorded in the shrub and herb layer of the forest. In tree strata native species are dominant but their recruitment in the form of sapling and seedlings are displaced by the dense thickets of invasives in both the communities. A highest value of ecological indices was evaluated in *Pinus roxburghii* dominated site as compared to the *Quercus leucotrichophora* dominated site. *Lantana camara, Eupatorium glandulosum, Clematis gouriana, Rosa brunonii, Rubus neivus, Euphorbia royleana* etc. are the most destructive Forest Invasive Species (FIS*) of both the forest communities. The present study gives an accurate assessment and understanding of the dynamics of invasives, which is further important for their scientific management and utilization.

454. **Khanduri, A., Biswas, S., Vasistha, H.B., Rathod, D. & Jha, S.K. 2017.** "A status of invasive alien species plant diversity in Tehri district Forest Ecosystem of Garhwal Himalayan Region". *Curr. World Environm.* 12(2): 377–388.

Abstract: Invasive alien species that is non-indigenous to an area, and which may have harmful effect on human, animal, plant health as habitat destruction, degradation and fragmentation of ecosystems. During the study observed the present status of plant diversity of Invasive Alien Species (IAS) in Tehri district of Garhwal Himalaya, Uttarakhand. Data were collected through extensive field survey and quadrat method. Result observed that 75 Forest Invasive Species (FIS) and 47 weed species documented from the area. Among the 75 FIS, 12 species belonging from Asteraceae, 7 species from Poaceae, 7 species of Solanaceae, 5 species of Lamiaceae, followed by four species of each Ranunculaceae and Polygonaceae while the other belongs to Papilionaceae, Cyperacea, Euphorbiaceae and various other angiospermic families were recorded. Weed Species from 5 different angiospermic families were recorded. The highest diversity was reported for Asteraceae family. Species diversity of IAS indicated that study area was distinctly dissimilar or unlike in diversity and unhealthy. An investigation of the habitat depicts that herbs prevail (11 species) followed by shrubs (8 species) and trees (2 species). However, major impact of these species on the indigenous flora, change in hydrology and function of ecosystems is yet to be studied. There is an urgent need to develop regional data, information on their ecology, morphology, reproductive biology, phenology and physiology for effective management and control of IAS. Present Study will helpful in further study on developing effective management and control protocol of IAS on spreading outside their natural habitat and most prominent menaces to biodiversity.

455. **Khanna, K.K. 2006.** "Changing patterns in the flora of Allahabad District, Uttar Pradesh– A case study of monitoring". *Phytotaxonomy* 6: 49–52.

Abstract: The paper deals with the changes in the flora of Allahabad district recorded during a recent survey conducted by the author. The changes include new record/ addition, disappearance and rarity of species in the district. Among the species collected, the following 10 are new records for the district: *Prosopis cineraria* (L.) Druce, *Caesalpinia bonduc* (L.) Roxb., *Datura innoxia* Mill., *Lippia javanica* (Burm. f.) Spreng., *Vitex negundo* L., *Arthraxon lancifolius* (Trin.) Hochst., *Dactyloctenium aristatum*

Link, *Echinochloa crusgalli* (L.) P. Beauv., *Eragrostiella brachyphylla* (Stapf) Bor and *Scirpus tuberosus* Desf. On the other hand, a number of species that were collected by earlier workers could not be recollected from the same or any other locality. In addition, a number of species, though reported as common earlier, are now rare. The detailed findings and the factors responsible for the changes have been discussed in the paper.

456. **Khanna, K.K. 2009.** "Invasive alien angiosperms of Uttar Pradesh". *Int. J.* 1(2): 41-46.

457. **Khanna, K.K. 2015a.** "Aquatic and marshy plants of Parvati Arga wetland, Gonda district, Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 39(2): 392–406.

Abstract: An account of aquatic and marshy pteridophytic and angiospermic plants occurring in Parvati Arga wetland, Gonda district, Uttar Pradesh has been presented in the paper. The study has indicated that a total of 153 species belonging to 106 genera and 47 families are found in the wetland. Out of these 3 species under 3 genera and 2 families belongs to Pteridophytes whereas 150 species under 103 genera and 45 families belongs to angiosperms. An analysis has further indicated that Cyperaceae is the most dominant family in the area. Moreover, 9 species are rare in the wetland.

458. **Khanna, K.K. 2015b.** "Floristic diversity of Sohelwa Wildlife Sanctuary, Uttar Pradesh". *Phytotaxonomy* 15: 166–191.

Abstract: The paper deals with an account of pteridophytic and angiospermic plants occurring in Sohelwa Wildlife Sanctuary, Uttar Pradesh. The study has indicated that a total number of 666 taxa belonging to 450 genera and 130 families are found in the sanctuary. The results have pointed out that 8 taxa under 7 genera and 7 families belong to pteridophytes whereas 658 taxa under 443 genera and 123 families belongs to angiosperms. An analysis has further indicated that Poaceae is the most dominant family and *Ficus* is the most dominant genus in the area. Moreover, 60 taxa are rare in the sanctuary. In addition, *Flemingia praecox* C.B. Clarke ex Prain is reported as a new record for Uttar Pradesh.

459. **Khanna, K.K. 2017.** "Angiospermic plants of Uttar Pradesh- A check list". *Geophytology* 47(1): 69–110.

460. **Khanna, K.K. 2018.** "Angiospermic plants of Terai region, Uttar Pradesh, India". *Bio. Bull.* 4(2): 26–102.

461. **Khanna, K.K., Mudgal, V., Uniyal, B.P. & Sharma, J.R. 1999.** *Dicotyledonous Plants of Uttar Pradesh– A Checklist.* Bishen Singh Mahendra Pal Singh, Dehradun.

462. **Kharkwal, G. 2002.** *Spatial Pattern of Plant Species Diversity with particular Reference to Forest Herbs along an Altitudinal Transect in Central Himalaya.* Ph. D. Thesis, Kumaun University, Nainital. (unpublished).

463. **Kharkwal, G., Mehrotra, P., Rawat, Y.S. & Pangtey, Y.P.S. 2005.** "Phytodiversity and growth form in relation to altitudinal gradient in the Central Himalayan (Kumaun) region of India". *Curr. Sci.* 89: 873–878.

464. **Khera, N., Kumar, A., Ram, J. & Tewari, A. 2001.** "Plant biodiversity assessment in relation to disturbances in mid elevational forests of central Himalaya, India". *Trop. Ecol.* 2: 83–95.

465. **Kholia, B.S. 2009.** "Gender variation in threatened and endemic palm *Irachycarpustakil* Becc.". *Curr. Sci.* 96: 144–148.

466. **Kholia, B.S. 2010.** Kumaun Fan Palm: *Trachycarpus takil* Becc. (Arecaceae)– In Retrospect. In: Tewari, L.M., Pangtey, Y.P.S. & Tewari, G. (Eds.), *Biodiversity Potential of the Himalaya.* Gyanodaya Prakashan, Nainital. Pp. 417–426.

467. **Khoshoo, T.N. 1992.** *Plant Diversity in the Himalaya: Conservation and Utilization.* Pandit Govind Ballabh Pant Memorial Lecture 11. Delivered at G.B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora.

468. **Khoshoo, T.N. 1993.** Himalayan Biodiversity Conservation - An Overview. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies.* GB. Pant Institute of Himalayan Environment & Development, Almora. Pp. 5–35.

469. **King, G. 1882.** *List of plants of Garhwal, Jaunsar-Bawar and Dehradun.* In: Atkinson's Gazetteer of North- West Province Himalayan District. Pp. 299–322.

470. **Kotia, A., Adhikari, B.S., Rawat, G.S. & Pasha, M.K.S. 2014.** "Status and distribution of *Coleus barbatus* Benth. in Tehri Garhwal district, Uttarakhand". *J. Biodiv. & Endangered Sp.* 2(2): 127.

Abstract: *Coleus barbatus* Benth. (Lamiaceae) is an important medicinal herb in the sub-Himalayan tracts of North India. Four major watersheds, namely Chamba, Ghansali, Lambgaon and Pokhal were identified in Tehri Garhwal District during the present investigation and within each watershed various habitats like pine forest, oak forest, open slopes, arable land and abandoned cultivated areas were selected. Through random quadrat sampling data was collected and the population of C. *barbatus* was calculated. Banj oak and chir pine forests had least population of C. *barbatus* (< 0.1 individual's m -2 and 0.1 individuals m -2, respectively). The habitats like open chir pine forest (3.9 individual's m -2), open grasslands (2.4 individuals m -2), arable lands (3.2 individuals m -2) and abandoned cultivated areas (3.3 individuals m -2) supported good population of C. barbatus. The conservation measures are discussed in the paper.

471. **Kukshal, S., Nautiyal, B.P., Anthwal, A., Sharma, A. & Bhatt, A.B. 2009.** "Phytosociological investigation and life form pattern of grazing lands under Pine canopy in temperate zone, Northwest Himalaya, India". *Res. J. Bot.* 4(2): 55–69.

Abstract: In temperate region of Northwest Himalaya, drier slopes are dominated by *Pinus roxburghii* and are known for rich ground herbaceous flora predominated by grasses. These regions serve as grazingland for livestock and cattle. Present study deals with vegetation analysis, phytosociology and life form pattern of such grazingland between 1100-1400 m a.s.l. across the altitudinal gradient and varying slopes. *Capillipedium parviflorum* is identified as dominant species based on Importance value index, although the area is exhibited by large number of herbs in comparison to grasses and sedges. Vegetation of the area is contagiously distributed and predominantely represented by therophytes and geophytes indicating the degree

of anthropogenic activities. The native vegetation is disturbed by overgrazing and life forms of the flora of each of the association are maintained by the intensity of grazing. In the sites under observations, besides grazing, fire was main detrimental factor for dominating the flora by therophytes. Codominance of geophytes may be assigned to its propagation through underground perennating organs as the fire type in these ecosystems is crown fire type. The study describes all these features.

472. **Kulkarni, A.R. & Pawar, B.S. 1996.** "Comment on a critical appraisal of the type locality of rare palm from Kumaun Himalaya, India". *Curr. Sci.* 70: 19–20.

473. **Kumar, A. & Ansari, A.A. 2012.** *A report on Floristic diversity of Katarniyaghat Wildlife Sanctuary, Uttar Pradesh,* Botanical Survey of India, Salt Lake City, Kolkata.

474. **Kumar, A. & Mitra, M. 2015.** *Landforms, plant diversity and their utilization by ungulates in upper Dhauli Valley, Nanda Devi Biosphere Reserve, Western Himalaya.* WWF-India, New Delhi.

475. **Kumar, A. & Rawat, S. 2011.** *Bioresources of Uttarakhand– Their Conservation and Management.* Bishen Singh Mahendra Pal Singh for UCOST, Dehradun.

476. **Kumar, A. & Singh, B. 2003.** "Crown architecture of the trees of a sub-tropical forest of Uttaranchal (Garhwal) Himalaya". *Indian J. Forest.* 26(4): 370–380.

Abstract: In the sub-tropical foot-hill forest of the Uttaranchal (Garhwal) Himalaya growing along the river Ganga near Rishikesh, 45 tree species were identified, out of which the 14 species viz., *Acacia catechu, Albizia julibrissin, A. procera, Bauhinia racemosa, Cordia wallichii, Dalbergia sissoo, Ehretia laevis, Emblica officinalis, Gmelina arborea, Holoptelea integrifolia, Miliusa velutina, Moringa oleifera, Ougeinia oojeinensis* and *Toona ciliata* represented Troll's model. Like-wise, the trees of *Aegle marmelos, Bombax ceiba, Mallotus philippensis, Schleichera oleosa, Terminalia alata* and *Terminalia bellerica* exhibited the Aubreville's model. *Alstonia scholaris,* and *Anogeissus latifolia* belonged to Prevost's model, *Cassia fistula* and *Erythrina glabrescens* represented Scarrone's model and *Casearia elliptica, Grewia oppositifolia* and *Shorea robusta* showed the Raux's model. The trees of *Ficus racemosa, F. palmata* and *F. Religiosa* represented by Rauh's model, *Adina cordifolia* and *Mitragyna parviflora* represented Fagerlind's model and *Holarrhena antidysenterica* and *Syzygium cumini* exhibited Mangenot's model. Champagnot's model was represented by *Lagerstroemia parviflora* and *Naringi crenulata* whereas *Sapium insigne* has been noted to represent Leeuwenberg's model.

477. **Kumar, A., Adhikari, B.S. & Rawat, G.S. 2015b.** Rangeland Vegetation of the Indian Trans Himalaya: An Ecological Review. In: Rawat, G.S. & Adhikari, B.S. (Eds.), 2015. *Ecology and Management of Grassland Habitats of India.* ENVIS Bulletin, Vol. 17 (Wildlife and Protected Areas). Wildlife Institute of India (WII), Dehradun.

478. **Kumar, A., Sharma, C.M. & Baduni, N.P. 1997.** "Community structure and physical environment: A case study of the temperate mixed conifer Lata forest in the Malari valley of Garhwal Himalaya". *J. Trop. Forest. Sci.* 9: 449–457.

Abstract: The structure of the temperate mixed coniferous forest in the area of Lata, Uttar Pradesh, was analysed in relation to its geoecological environment. The main rock types in the area are garnetiferous mica schists and sericite chlorite quartzite.

The soil is loam (predominantly sandy), with high average levels of organic carbon (1.2%), low phosphorus (11.28 kg ha^{-1}) and high potash (322.17 kg ha^{-1}) contents. *Pinus wallichiana* constitutes 41% of the total basal area (on steep schist slopes), followed by *Cedrus deodara* (35%, on schist dip slopes), *Cupressus torulosa* (12%, on limestone), *Taxus baccata* (9%, on gneiss) and *Betula utilis* (only 3%, on upper inaccessible terrain with phyllites (mica)) in the tree layer. The total tree density ranges from 33 to 366 trees ha^{-1}, whereas the total basal area is between 1.75 and 24.52 m^2 ha^{-1}. The commonly associated species of shrubs include *Prinsepia utilis*, *Berberis asiatica* and *Cotoneaster acuminata*, which form a heterozygous vegetational cover.

479. **Kumar, A., Singh, B. & Prabha, S. 2008.** "Distribution of tree and shrub vegetation in some foothill forests of Garhwal Himalayas". *Indian Forester* 134(4): 515–524.

Abstract: As many as 45 species of trees and 31 species of srubs were found in the foothills forests of Garhwal Himalaya but without exhibiting domination by any particular species. The trees of *Cassia fistula, Haldina cordifolia, Holoptelea integrifolia* and *Mallotus philippensis* were recorded at all the slopes and sites throughout the forests whereas species like *Alangium salvifolium, Bauhinia purpurea, B. racemosa, Bombax ceiba, Crataeva nurvala, Dalbergia lanceolaria, Dalbergia sissoo, Ficus palmata, Grewia oppositifolia, Mitragyna parviflora, Moringa oleifera, Ougeinia oujeinensis, Sapium insigne, Stereospermum suaveolens* and *Trema politoria* were sporadic in distribution and wre recorded only at a few places in the forests under study. The remaining species were distributed unevenly. Numerically, 35 tree species were recorded in lower forests growing near the riverside, 32 species in the forests of lower/middle slopes and 33 species at the upper ridges of the hills. The trees of *Terminalia bellirica* exhibited the highest average circumference (249.12 cm), followed by *Albizia julibrissin* (195.2 cm), *Adina cordifolia* (188.77 cm), *Alstonia scholaris* (162.79 cm), *Schleichera oleosa* (149.39 cm), *Bombax ceiba* (142.12 cm) and *Terminalia alata* (138.03 cm). Minimum average circumference was recorded for *Holarrhena antidysenterica* (31.78 cm) among all the tree species growing in the forest under study. Among shrubs species recorded in the area, *Adhatoda vasica* and *Murraya koenigii* were quite abundant in most of the forests. Maximum similarity among various forests stands, both for trees and shrubs, were between the Similarity Class 60-80%. The absence of Similarity Class below 40% indicated that the forests were not much disturbed.

480. **Kumar, A., Mitra, M., Adhikari, B.S. & Rawat, G.S. 2013.** "Archetype conservation in Trans-Himalayan region of Nanda Devi Biosphere Reserve, Western Himalaya". *eJ. Appl. Forest Ecol.* 1(1): 84–86.

Abstract: The Tolcha tribes, a sub-division of Bhotiya community of Gamsali village in Nanda Devi Biosphere Reserve have protected 2 an area ca.1.5 km for the conservation of a plant species i.e. *Allium stracheyi* Baker, locally known as 'Jambu-pharan'. It is native to Himalayan region, vulnerable and an important medicinal and aromatic plant used by locals to garnish the traditional cuisine for flavour. Jambu-pharan is a perennial and bulbous herb mainly found between 2500-3500 m elevations in alpine regions of Uttarakhand. To maintain the genetic pool and the natural

population in the area the locals have adopted an archetype. Conservation of the species through community participation and can set an example for other areas through religious and cultural beliefs.

481. **Kumar, A., Mitra, M., Adhikari, B.S. & Rawat, G.S. 2016.** "Flora of Niti Valley: A cold arid region of Nanda Devi Biosphere Reserve, Western Himalaya, India". *Check List* 12(1) (Article 1824): 1–16.

Abstract: Located in the extended buffer zone of Nanda Devi Biosphere Reserve in Western Himalaya, Niti valley represents a cold arid region. The reserve has been extensively surveyed in terms of floral diversity by various workers, albeit highly confined to the core zones. The current survey recorded 495 species belonging to 267 genera and 73 families of vascular plants through systematic collection in the years 2011, 2012 and 2014. Of the recorded species, 383 were dicots, 93 monocots, 9 pteridophytes and 10 gymnosperms. Asteraceae was most diverse family (32 genera with 58 species), followed by Poaceae (22 genera with 41 species), Lamiaceae (15 genera with 19 species) Fabaceae (14 genera with 22 species), Brassicaceae (12 genera with 12 species) and Rosaceae (11 genera with 36 species). The present survey also updates the existing flora of Nanda Devi Biosphere Reserve (801 species) with addition of 167 species. This study reveals that the Niti valley forms a transition zone, as the floral elements have affinity with Trans as well as Greater Himalaya.

482. **Kumar, A., Mitra, M., Singh, G. & Rawat, G.S. 2012.** "An inventory of flora of Binog Wildlife Sanctuary, Mussoorie, Garhwal Himalaya". *Indian J. Fundamental & Appl. Life Sci.* 2(1): 281–299.

Abstract: Systematic survey on the vascular plants was conducted in the Binog Wildlife Sanctuary, located in the outermost hill ranges of the Garhwal Himalaya. A total of 300 species of angiosperms (211 genera and 86 families), 31 species of Pteridophytes (23 genera and 14 families) and 4 species of Gymnosperms (3 genera and 2 families) were recorded from 1081.97 hectare area, between 1500-2330 m altitudes. The dominant families of Angiosperms were Asteraceae (19 genera, 32 species), Papilionaceae (14 genera, 22 species), Lamiaceae (12 genera, 22 species), Rosaceae (11 genera, 18 species), Poaceae (13 genera, 15 species), Ranunculaceae (5 genera, 9 species), Lauraceae (4 genera, 7 species), Polygonaceae (3 genera, 7 species), Urticaceae (5 genera, 6 species and Rubiaceae (4 genera, 6 species). In Gymnosperms, only two families (Coniferae and Cupressaceae) were recorded of which Coniferae had 3 species while Cupressaceae had only one species. A total of 31 species of Pteridophytes were recorded from the region in which family Polypodiaceae (6 genera, 8 species) was dominant.

483. **Kumar, A., Bahuguna, A., Rawat, G.S., Mohan, D., Sinha, S., Srivastava, S.K. & Bannerjee, A.K. 2002.** *Biodiversity Strategy and Action Plan (BSAP) Uttaranchal.* Forest Department, Uttaranchal; Zoological Survey of India; Botanical Survey of India and TERI, Dehradun.

484. **Kumar, B. 2012.** "Quantitative analysis of tree species in mixed forests of Mandal catchments, Garhwal Himalaya". *Int. J. Conserv. Sci.* 3(2): 107–110.

Abstract: A total of 14 tree species were identified in the study sites, among which *Quercus leucotrichophora* Hook. F. (Banj oak), *Rhododendron arboreum* Smith (Burans), *Lyonia ovalifolia* Drude (Ayar) and *Pyrus pashia* Buch-Hemp (Mehal) are the predominant tree species. A quantitative analysis of tree species indicates that on the basis of their canopy cover, tree density and total base area, these study sites fall within the category of disturbed forest. The uncontrolled lopping for timber, firewood and leaf fodder and the absence of saplings and seedlings are some of the major factors responsible for the declining of forests in the Himalayan region.

485. **Kumar, M., Sharma, C.M. & Rajwar, G.S. 2004.** "A study on community structure and diversity of a sub-tropical forest of Garhwal Himalayas". *Indian Forester* 130(2): 207–214.

Abstract: Two study sites selected on the basis of the disturbance gradient at the elevation from 900 to 1,300 m asl in the sub-tropical zone of district Oauri of the Garhwal Himalayas were studied for the structure and diversity of the forests. Density, total basal cover, importance value index, similarity index, concentration of dominance, diversity index, beta diversity and equitability index were analysed for tree, shrub, sapling and seedling layers of the forests and compared for the both the sites. The forest sites showed differences in analytic characters. The concentration of dominance and the index of diversity were higher for the mildly disturbed forest site.

486. **Kumar, M., Rajwar, G.S., Sharma, C.M. & Dhaulakhandi, M. 2005.** "Disturbance patterns and diversity in herbaceous plant community in a temperate forest of Garhwal Himalaya". *Ann. Forest.* 13(1): 167–174.

Abstract: The present study deals with the quantitative analysis of herbaceous vegetation on elevation ranging from 1900 to 2400 m asl in the temperate region of Garhwal Himalaya. Floristic composition, diversity, dominance and distribution pattern of herbaceous species were studied in three different stands viz., undisturbed (UD), midly disturbed (MD) and highly disturved (HD), during three different prominent seasons (winter, summer and rainy) in the temperate forest along disturbance gradients. On HD sites higher species diversity was noticed due to invasion of new species in each season. The range of diversity (2.995 to 4.345) and concentration of dominance (0.045 to 0.122) oscillated remarkably during summer season on UD sites. Contiguous distribution was observed throughout, however, on MD and HD sites during rainy season, random distribution was also found. The highest value of equitability (46.149) was recorded on MD site during winter season whereas, lowest value (20.900) was recorded on UD site during winter season.

487. **Kumar, N. & Nautiyal, S. 2017.** "Leaf anatomy of two genera of tribe Eragrostideae (Poaceae) from Mandal forest of Kedarnath wildlife sanctuary, Uttarakhand, India". *Int. J. Bot. Stud.* 2(5): 50–55.

Abstract: The Poaceae is a grass family importantly covering all the cereals. The grasses are so vital in the economy of nations and particularly in an agricultural country like ours, where the provision of food and fodder is a constant problem for the populace and it is surprising that more time and energy have not been devoted to the study of the Poaceae. This tribe is characterized by unspecialized spikelets usually with several florets, 3-veined lemmas, and a rather cartilaginous texture, and also by a ciliate ligule, although there are exceptions to all these characters. Leaf anatomical investigations of two Generas belonging to tribe Eragrostideae (Poaceae) were carried out from. Maximum length of long cells was observed in genus *Eragrostis*. Microhairs with hemispherical distal cell, saddle shaped silica bodies and bulliform cells deeply penetrating the mesophyll are the diagnostic characters, which justify both the species in the same tribe.

488. **Kumar, P., Lata, K. & Narain, S. 2008.** "Asteraceae of Ghazipur district, Uttar Pradesh, India". *J. Phytol. Res.* 21(1): 107–110.

Abstract: This paper gives an enumerative account of 33 species belonging to 25 genera of family Asteraceae to the flora of Ghazipur district (U.P.). The paper provides key to the genera, nomenclature, locality and field number of each species collected from the Ghazipur district.

489. **Kumar, R. & Kumari, B. 2017.** "Diversity of grass flora of Moradabad district with special reference to their utility". *Int. J. Bot. Stud.* 2(6): 166–169.

Abstract: Within the wide diversity of flowering plants 'Grasses' are the one which can be found anywhere with great abundance. Grasses are the members of Poaceae (Gramineae) family which are the most vital part in our life as food, medicine, cattle-fodder and many different things. The rural people of Moradabad district use different parts of grasses in crude form as cure for many diseases. This paper deals with 62 grasses belonging to seven subfamilies and thirteen tribes. Sub-family Panicoideae exhibits maximum representation with 34 species followed by Chloridoideae with 14 species. *Bambusa arundinacea* Willd., *Dendrocalamus strictus* (roxb.) Nees., *Leersia hexandra* Sw., *Thysanolaena maxima* (roxb.) O. Kuntze are rare grasses of the study area.

490. **Kumar, R., Khare, A.K. & Singh, H. 2011.** "Phytosociological and ecological profiling of the angiosperm weed diversity in campus and adjoining area of G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, India". *Indian J. Forest.* 34(2): 221–224.

Abstract: The present communication deals with the taxonomic and ecological enumeration of the weed flora of the campus and adjoining area of G.B. Pant University of Agriculture and Technology, Pantnagar. Being situated on Himalayan foothills and spreaded in a vast campus of more than 16000 acres, the university has been a world famous centre of agriculture and botanical activities. In the present investigation carried out during 2007-2009 that 149 species of the angiospermic weed belonging to 34 families were collected, of which 105 weed species were from 29 dicot families and 44 families were from 5 monocot families distribution and seasonal variations of the collected species were also recorded.

491. **Kumar, R., Verma, A.K. & Kumar, A.B. 2018.** "Checklist of angiosperms in Shahjahanpur, Uttar Pradesh, India". *Indian J. Forest.* 41(2): 179–194.

Abstract: Floristic surveys were carried out in the Shahjahanpur district, Uttar Pradesh from 2009 to 2012. The vegetation of this region is dry deciduous and this is the first

exclusive floristic study in the district. The paper enumerates 527 species of angiosperms found as wild or naturalised in the study area. These species are distributed in 346 genera and 94 families. Out of them, 78 families, 271 genera and 411 species belongs to dicotyledons and 16 families, 75 genera and 116 species to monocotyledons. The proportion of monocotyledons to the dicotyledons is 1:3.5 and genus to species is 1:1.5. Families with maximum number of species are Fabaceae (61), Poaceae (53) and asteraceae (50), which together represent 31.1% of all the species. Orchidaceae, the most dominant family of India is represented by only one number, i.e., *Zeuxine strateumatica* of the total 381 species are herbs (72.43%), 55(10.45%) is shrub, 52 (9.88%) trees and 38 (7.22%) climbers. According to IUCN criteria, one species is classified as Data Daficient and 43 species as Least Concern.

492. **Kumar, S. 1985.** "Grass pollen as aeroallergens in urban environment at Bareilly (India)". *Geobios, New Rep.* 4: 34–37.

Abstract: In an aerobiological survey, the grass pollen makes 30% of the total air spora at Baroilly with highest abundance in September. The temperature and wind velocity have a positive effect on grass pollen catch, while heavy rains wash them down from air during July-August.

493. **Kumar, S. 1987.** "Phytosociological studies on the weeds of rice fields". *Geobios* 14: 168–172.

Abstract: Sixty six species of weeds were collected growing in paddy as well as on the field margins of Meerut district. Most of these appear when the rice fields begin to dry up. *Cyperus rotundus, Cynodon dactylon, Trianthema portulacastrum, Oxalis corniculata* and *Crotalaria medicaginea* have high density and frequency occurrence. Rice crop at 55 to 70 days after transplantation, suffers badly due to woody grasses and sedges.

494. **Kumar, S. 2001**. *Plant Diversity Along River Ganga*. Sai Publishers, Dehradun.

495. **Kumar, S. 2003.** *Studies on the Woody Species Diversity in Kail Ganga Watershed of Garhwal Himalaya using Remote Sensing and Geographical Information System*. Ph.D. Thesis, Forest Research Institute (FRI). Deemed University, Dehradun. (Unpublished).

496. **Kumar, S. 2012.** "Herbaceous flora of Jaunsar-Bawar (Uttarakhand), India: Enumerations". *Phytotaxonomy* 12: 33–56.

Abstract: Jaunsar Bawar is the northern mountains section of Dehra Dun district of Uttarakhand, now comprising three Tehsils (revenue sectors) viz., Kalsi, Chakrata and Tiuni. It lies between Lesser Himalayan ranges of the Western Himalaya with elevation range between c. 500 m to 3071 m and spread over an area of about 700 sq. Km. With more than half under reserved forests. Based on historical plant collections made during the past two centuries and fresh collections done from 1977 onwards by the present author, an enumeration of 1005 taxa of herbaceous angiosperms has been drwn. It includes 997 species spread over 462 genera and 97 families arranged as per the arrangement of Bentham & Hooker's classification with split families.

497. **Kumar, S. & Balodi, B. 2000.** "Promising oil yielding plants of Garhwal and Kumaon regions of Western Himalaya". *J. Non-Timber Forest Prod.* 7(1/2): 131–134.

Abstract: The paper deals with promising oil yielding plant species growing at different altitudinal zones (300-3000 m) in Garhwal and Kumaon region. The importance of these species in improving the rural economy is also highlighted in this communication.

498. **Kumar, S. & Kumar, S. 2003.** "Glimpses of plant diversity of Uttaranchal". *Ann. Forest.* 11(2): 175–181.

Abstract: Uttaranchal- a newly carved State comprising Garhwal and Kumaon regions- is one of the floristically richest and diverse States of the Indian Union with more than 4,000 species of flowering plants. Due to diversity of soil, climate and topography this State possesses almost all types of vegetation which includes (i) Terai vegetation, (ii) Sub-tropical, (iii) Temperate, (iv) Sub-alpine and alpine vegetation. The present paper provides a glimpses of all vegetational types alongwith suitable examples of plant taxa including important medicinal plants, botanical curiosities, wild ornamentals and endemic taxa and a brief note on their conservation.

499. **Kumar, S. & Kumar, S. 2006.** Phytogeography of Western Himalaya with special reference to Chakrata, Uttaranchal. Proceedings of National Symposium- Plant Science Research in India: Challeges and Prospects. Pp. 197–212.

500. **Kumar, S. & Nandavani, D. 2003.** *Plant Diversity of Some Wetlands of Doon Valley.* Oriental Enterprises, Dehradun.

501. **Kumar, S. & Narain, S. 2010.** "Growth form of macrophytes in Salona Tal and its adjoining wetlands of Uttar Pradesh". *Int. J. Pharma & Bio Sci.* VI(2): 1–12.

Abstract: Salona Tal with their wetlands has large eutrophic water body spread over 4234 sq. km. During the survey 193 angiosperm species belonging to 118 genera of wetland and aquatic macrophytes with rare species e. g. *Centrostachys aquatica, Alternanthera philoxeroides, Neptunea oleracea* etc. are reported and classified according to their growth forms and enumerated with their diversity, growth form and phenology. Current status and conservation measure are also reported in this paper.

502. **Kumar, S., Pande, R. & Arya, D. 2016.** "Shoot demography of some evergreen and deciduous tree species of Kumaun Himalaya, India, along an altitudinal gradient". *Scientific Res. & Essays* 11(1): 1–10.

Abstract: The shoot diameter and shoot length extension growth studied in 10 tree species occurring between 350 to 2500 m elevation in the Kumaun Himalaya. Effects of temperature on shoot growth were studied under natural conditions. Shoot length growth was significantly affected by the temperature during shoot elongation ($p<0.01$). The optimum temperature for elongation was ranged from 21Ú to 36Ú C across the altitudinal gradient. The shoot elongation growth was positively correlated with the shoot diameter growth in all species. The peak activity of leafing takes place during March–April when photoperiod and temperatures are incrementing. All species showed a clear peak value of radial growth in the first few months of growing season. Over 90% of the radial growth was accomplished by the late summer season in the most species; only in a few species it was extended upto the later part of the rainy season. On the basis of successional status, early successional species show a faster shoot extension growth than late successional species.

503. **Kumari, B. 2009.** "Alien invasive plant species of district Moradabad (U.P.), India". *Pl. Archives* 9(2): 723–724.

504. **Kumari, B. 2018a.** "A preliminary survey of poisonous angiosperms of Rohilkhand region of Uttar Pradesh, India". *Int. J. Bot. Stud.* 3(1): 140–143.

Abstract: Poisonous plants comprise the third largest category of poisons known around world. An account of 41 poisonous angiosperms under 22 families occurring in Rohilkhand region of Uttar Pradesh (India) has been documented. In this survey, total nine districts were surveyed and collected the information of the poisonous plants that are grown, wild, planted, cultivated & naturalized of road sides, park avenues and gardens. The plants were identified with the help of different published floras and herbarium lodged in FRI & BSI, Dehradun and BSI Allahabad. The information on the poisonous plant's species has been gathered from the local people during ethno-botanical field survey. The study suggests that the local people are not only aware of such poisonous plants and their harmful effects, but also use them to treat various ailments.

505. **Kumari, B. 2018b.** "Taxonomy and ethnobotany of *Murraya koenigii* (L.) Spreng: An exotic shrub in Rohilkhand region of Uttar Pradesh". *J. Med. Pl. Stud.* 6(4): 123–125.

Abstract: Medicine is food and food is medicine" is the best way to describe on how the ailments were cured by using the plants during the ancient period of time. The "Magical plant of Indian Spice" (*Murraya koenigii*) has served humankind not only as food enhancer but also serve as village or folk medication to cure many disorders, the tribal communities have used many parts of the *Murraya koenigii* to cure them. A survey of study area revealed that *Murraya koenigii* used to cure pieria, diabetes, obesity, dysentery disorders, renal pain, stomach upsets and morning sickness.

506. **Kumari, B., Singh, S.P. & Singh, K.K. 2018.** "Angiosperm diversity of stress sites of Moradabad district of Rohilkhand region (Uttar Pradesh)". *Int. J. Advanced Scientif. Res. & Manage.* 1: 48–51.

Abstract: Forty-two species of Angiosperms have been recorded from the Sodic soil affected stress sites of Moradabad district in U.P. Herbs accounted for 21 species, shrubs 11 species, undershrub 2 and trees 2 species whereas grasses represented by 6 respectively. Poaceae and Euphorbiaceae families have maximum representation in the area with 6 species each. Out of 42 species twelve species are in invasive status namely *Argemone mexicana* L., *Portulaca quadrifida* L., *Sida acuta* Burm. f., *Urena lobata* L., *Parthenium hysterophorus* L., *Tridax procumbens* L., *Xanthium indicum* Koenig, *Calotropis procera* Ait., *Ipomoea carnea* subsp. *fistulosa* (Mart. ex Choisy) Austin, *Ruellia tuberosa* L., *Croton bonplandianum* Baill. and *Euphorbia hirta* L.

507. **Kumari, B., Singh, S.P., Singh, A.P., Kumar, R. & Verma, S. 2016.** "A preliminary survey of invasive alien angiosperms of Rohilkhand region (U.P.), India". *Pl. Archives* 16(1): 45–50.

Abstract: A survey of invasive alien plant species of Rohilkhand region was made and we found a total richness of 79 species belonging to 29 families. Dicots represented 72 species and monocots 7 species. About 70.88% of these alien species were introduced from tropical America including South America, followed by tropical Africa

(11.39%). Maximum numbers of species (21) were from the family Asteraceae, followed by Amaranthaceae (7), Euphorbiaceae (5) and then Papilionaceae and Caesalpiniaceae with four species. Herbs accounted for 58 species, undershrubs 6 species, shrubs 6 species, climbers 2 species, and trees 2 species whereas grasses and sedges represented 3 and 2 species respectively. The data revealed that both aquatic and terrestrial invasive plant species are becoming threat to the native flora as they reproduce rapidly and crowding out native species.

508. **Kumari, P. & Tewari, L.M. 2009.** "Biodiversity in Uttarakhand Himalayan region". *Nature & Sci.* 7(3): 113–125.

Abstract: Himalaya means Abode of Snow. The Himalaya have been the supreme benefactor and protector of our country in many ways from million of years. Though youngest of the mountain chains in the world, the Himalaya have attracted tourists, philosophers, scientists and saints alike. The Uttrakhand Himalaya region provides a matchless wealth of medicinal and aromatic plants & is known to be a natural reservoir. Uttrakhand region is well known for its biodiversity. This paper aims to evaluate the present conditions of resources as a form of natural vegetation, agricultural crops, horticultural farming, herbs, tea garden practices and economic development of the Uttaranchal Himalaya.

509. **Kushwaha, A.K., Tewari, L.M. & Chaudhary, L.B. 2018.** "Angiosperm diversity of Sonbhadra District, Uttar Pradesh: A checklist". *J. Threatened Taxa* 10(9): 12247–12269.

Abstract: The present study provides a taxonomic account of the angiosperms of Sonbhadra District in Uttar Pradesh. The district, which comes under the Vindhyan region of Uttar Pradesh, is one of the richest areas in the state as far as plant diversity is concerned. It is spread over about 6788 km of geographical area, which constitutes about 36% forest cover on highly undulated land. The extensive survey of the area conducted during 2011-2016, critical examination of previous collections housed at various herbaria, and review of published literature have resulted in a total of 705 species belonging to 459 genera under 110 families. Out of these, 541 species (76.73%) under 354 genera (77.12%) and 89 families (80.90%) belong to dicots, and 164 species (23.26%) under 105 genera (23.26%) and 21 families (19.09%) to monocots. The present enumeration of the species also includes about 78 species cultivated in the area for various purposes. Fabaceae (110 spp.) comprises of the maximum number of species, followed by Poaceae (89 spp.), Asteraceae (38 spp.), Cyperaceae (33 spp.), and Malvaceae (33 spp.). Some of the largest genera in the area are *Cyperus* (14 spp.), *Ipomoea* (9 spp.), *Solanum* (9 spp.), *Ficus* (9 spp.), *Crotalaria* (7 spp.), *Desmodium* (7 spp.), *Bauhinia* (6 spp.), *Hibiscus* (6 spp.), *Fimbristylis* (6 spp.), *Acacia* (5 spp.), etc. The entire forest is chiefly dominated by trees such as *Acacia catechu* (L. f.) Willd., *Boswellia serrata* Roxb. ex Colebr., *Butea monosperma* (Lam.) Taub., *Hardwickia binata* Roxb., and *Shorea robusta* Gaertn.

510. **Lal, C., Negi, B.S., Kukreti, M., Singh, E.M. & Ghildiyal, J.C. 1997.** "The aquatic vegetation of Uttarkashi– Garhwal Himalayan region, U.P.". *J. Econ. Taxon. Bot.* 21(1): 79–82.

Abstract: The present paper enumerates the aquatic vegetation in different water bodies near about Uttarkashi during 1992-1993. About 50 species belonging to different families have been recorded. Out of 50 species enumerated the present investigation consists-1 submerged bryophyte, 2 pteridophytes, 24 monocotyledons and 18 dicotyledons. *Monochoria vaginalis, Alisma plantago-aquatica, Riccia fluitans, Chara* sp., *Nitella* sp. and *Selaginella* sp. are quite abundant. *Acorus calamus, Phragmitis* sp., *Salix* sp., *Typha* sp. are wide spread rapidly in different water bodies.

511. **Ling, Y.R. 1991.** "An enumeration of *Artemisia* L. and *Seriphidium* (Bess.) Poljak. (Compositae) in Himalayas and the South Asian subcontinent". *Bull. Bot. Surv. India* 33(1-4): 296–308.

Abstract: This paper enumerates 54 species and 10 varieties of *Artemisia* L. *sensu stricto* and 4 species of *Seriphidium* (Bess.) Poljak. of Compositae including 5 new combinations from Himalayas and the South Asian Subcontinent.

512. **Luna, R.K. & Sharma, S.C. 2006.** "Seed source variation in morphological characters and oil content of *Jatrohpa curcas* Linn. in North-West India". *J. Non-Timber Forest Prod.* 13(3): 221–225.

Abstract: Variation in different seed morphological and fatty oil contents were studied among 25 seed sources from Punjab, Himachal Pradesh, Jammu & Kashmir and Uttranchal. Though statistically significant differences were tound for fruit diameter, number of seeds in a fruit, seed length, seed width, seed thickness, weight of 100 whole seeds, weight of seed coat of 100 seeds and weight of kernels of 100 seeds among different sources, no seed source was found to be the best for all traits. Seed source S_{20} (U.P. Dunera, Gurdaspur Forest Division) gave the maximum oil content of 33.10 per cent, which however, was much lower as compared to Chhindwara source of Madhya Pradesh which is reported to yield 39.12 per cent oil (on whole seed basis). The study, therefore, cautions that provenance research should be done before undertaking large scale plantations to avoid any unsavoury situation.

513. **Maheshwari, J.K. & Tomar, R.P.S. 1983.** "A contribution to the wetland flora of Sitapur district, Uttar Pradesh". *J. Bombay Nat. Hist. Soc.* 80(3): 529–538.

Abstract: The paper presents an account of the wetland flora of Sitapur district, Uttar Pradesh. 147 species of angiosperms belonging to 54 families has been reported from the lakes, pools, ponds and marshes in the district.

514. **Maikhuri, R.K., Rao, K.S. & Nautiyal, S. 2002.** Management options for Nanda Devi Biosphere Reserve. In: *Traditional Ecological Knowledge for Managing Biosphere Reserves in South and Central Asia.* Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi. Pp. 49–70.

515. **Maikhuri, R.K., Rao, K.S. & Saxena, K.G. 2004.** "Bioprospecting of wild edibles for rural development in central Himalayan Mountains of India". *Mount. Res. & Develop.* 24(2): 110–113.

Abstract: Despite abundant wild edible plant resources with immense potential for economic development, Uttaranchal, a newly created hill state situated in the Central Indian Himalaya, remains underdeveloped, owing primarily to inaccessibility and poor infrastructure. Development initiatives show little concern for mountain perspectives.

Yet the region is rich in resources and underutilized plant species with potential food value, about which there is little knowledge. For the present study, 13 potentially exploitable wild fruit species and 1 semidomesticated species with good potential for exploitation were selected; 6—*Aegle marmelos* (bael or Bengal quince), *Berberis asiatica* (barberry), *Hippophae rhamnoides* (sea buckthorn), *Myrica nagi* (box myrtle), *Rubus ellipticus* (yellow Himalayan raspberry) and *Prunus armeniaca* (apricot) were examined closely in terms of economic potential. A variety of value-added edible products such as jam, jelly, juice, and squash were made to generate income from these wild fruits, particularly for poor rural people. This was demonstrated locally to encourage people to engage in small-scale village-level cottage industries.

516. **Maikhuri, R.K., Semwal, R.L., Singh, A. & Nautiyal, M.C. 1994.** "Wild fruits as a contribution to sustainable rural development: A case study from the Garhwal Himalaya". *Int. J. Sustain. Develop. & World Ecol.* 1: 56–68.

Abstract: Garhwal Himalaya is an important source of wild fruit species. These wild fruit trees grow abundantly across an altitudinal gradient of Himalaya and the majority of them bear fruits during summer. Fruit varieties are eaten raw by the local inhabitants of the region and whilst they are a rich source of protein, carbohydrate, fat and other elements, compared to cultivated fruits, they have not yet been considered as a source of alternative food products. About 13 potentially exploitable species of wild fruits and one semi-domesticated species having high potential for exploitation were selected for study; six (*Aegle marmelos, Berberis asiatica, Hippophae rhamnoides, Myrica nagi, Rubus ellipticus* and *Prunus armeniaca*) were examined in detail for their economic potential. Among the wild fruits, *Hippophae rhamnoides* was found to be economically efficient, followed by *Aegle marmelos, Rubus ellipticus* and *Myrica nagi*, respectively. *Prunus armeniaca*, a semi-domesticated and less utilized fruit of the higher Himalaya, provides better economic returns on an annual basis. The authors have recently made an attempt to utilize these wild fruits as a source of income, particularly for poor rural inhabitants and unemployed youths of the region by making a variety of edible products such as jam, jelly, juice, squash, sauce, etc. The enterprise was demonstrated to the people to encourage them to adopt it in the form of a small village-level cottage industry. The present paper discusses the distribution, botany, phenology, yield, ethnobotany, and uses of these species, and the cost-benefit analysis of food products prepared from them.

517. **Maikhuri, R.K., Nautiyal, S., Rana, U., Tiwari, S., Rao, K.S. & Saxena, K.G. 2000.** Garhwal Himalaya: Nanda Devi Biosphere buffer zone forest ecosystems. In: Ramakrishnan, P.S., Chandra Sekhara, U., Elourd, C., Guilmota, C.Z., Maikhuri, R.K., Rao, K.S., Sankar, S. & Saxena, K.G. (Eds.), *Mountain Biodiversity: Land Use Dynamics and Traditional Knowledge*. UNESCO, Oxford and IBH Publishing Co., New Delhi. Pp. 265–298.

518. **Maithani, G.P. 1994.** "Dimensions of fuelwood problems of U.P. hills and solutions thereof". *Indian Forester* 120(3): 202–209.

Abstract: U.P. Hill region forests are fast degrading. Though this is causing many problems but fuelwood scarcity is most acute. In rural areas fuel wood demand is estimated to be about 3.5 million tons. Most of it stands as deficit and met through irregular removals. The lands and funds required to meet the deficit by raising plantations are rather physical impossibility. In addition to plantation both inside and outside forestry, socio-economic development and providing alternate source of energy have been suggested. Yields from the forests should be assigned for meeting local rural needs. Efficient protection and management of the existing forests should be aimed at for increasing their productivity. Efficient and just distribution systems and participation of local people in creation and management of assets have been emphasized. Some trees and shrubby species have been suggested for raising fuelwood crops both in the forests and agri-ecosystems. Study of the problem in proper perspective and carrying out research thereon need proper and adequate attention. Linking firewood problem with over all energy programme has been indicated. Eco-system diagnosis and cure approach should be adopted. Some policy and technical aspects to forest management in general and fuelwood supply in particular have been given.

519. **Maithani, G.P., Bahguna, V.K. & Lal, P. 1986.** "Effect of forest fires on the ground vegetation of a moist deciduous Sal *(Shorea robusta)* forest". *Indian Forester* 112(8): 646–678.

Abstract: Vast tracts of forests are destroyed every year due to forest fire in India. Fire not only eliminates the regeneration of important tree species, but also causes serious damage to the site conditions, habitat of wildlife and thus to overall ecological structure of the forest. In this paper, studies made to find out the detrimental effects of fire on the ground vegetation in the west Dehra Dun Forest Division are described. The studies were carried out in the burnt and adjacent unburnt area of natural Sal forest of Asarori Range, Chandraboni block-I. Relative Frequency, relative density and relative dominance and Importance Value Index (IVI) of different forest tree species as well as of ground vegetation were determined. The studies reveal that the regeneration of Sal and its associates such as *Mallotus philippensis* is considerably reduced and species such as *Bauhinia racemosa, Bombax ceiba, Pterospermum acerifolium* and *Melia azadirachta* etc. were completely eliminated. The herbs and shrubs, however showed increase in the relative frequency, relative density and relative dominance in burnt area. Some species like *Flemingia pulchella, Phyllanthus urinaria, Bauhinia vahlii, Tylophora* species etc. which are eaten by wild animals have shown increase in burnt site and this can be used as management tool in National Parks and Sanctuaries for Range Management in Wildlife.

520. **Maithani, G.P., Bahguna, V.K. & Negi, J.D.S. 1986.** "Natural processes in the redeeming of Garhwal Himalayan wastelands and future strategies for reclamation–A case study". *Indian Forester* 112(7): 608–615.

Abstract: The paper describes the results of a case study on the role on natural process in the revegetation of Himalayan eroded slopes, and other ecologically disturbed areas. The study, after observation of these areas, reveals that the areas can be reclaimed initially through planting of shrubs. The details of the species noticed during the study have been listed.

521. **Maithani, G.P., Bahguna, V.K. & Negi, J.D.S. 1988.** "Survey of shrubs for hastening the process of reclamation of ecologically vulnerable areas of Central Himalayas". *Indian Forester* 114(5): 243–250.

Abstract: This paper describes the results of a survey conducted on the pioneering species growing in the degraded areas of Garhwal Himalayas. The concept of eco-development can be achieved in these hills through planting of shrub species. A list of shrubs growing on wastelands is given along with their economic importance.

522. **Maity, D. & Balakrishnan, N.P. 2006.** "Taxonomic status of *Euphorbia sharmae* U.C Bhattacharyya (Euphorbiaceae)". *J. Econ. Taxon. Bot.* 30(1): 186–189.

Abstract: The differences between *Euphorbia sharmae* U.C. Bhattacharyya and *E. stracheyi* Boiss. are found to be of minor value and do not justify treating them as separate species. Hence, the former is reduced to the subspecific level of the latter.

523. **Majumdar, A. & Adhikari, B.S. 2012.** "Plant community composition and structure of Chenab valley in a part of Nanda Devi Biosphere Reserve". *Notulae Scientia Biologicae* 4(3): 45–56.

Abstract: The present paper deals with the vegetation communities and their diversity patterns in Chenab valley, the buffer zone of Nanda Devi Biosphere Reserve (NDBR) in Chamoli District of Uttarakhand, India. A total of 42 sites were selected randomly based on the landform heterogeneity of the area. Eight forest communities with overlap among vegetation types and also various plant associations were noticed through Principal Component Analysis (PCA) following PAST program and two shrub communities identified separately were, Berberis and bamboo. The range of density in various forest communities was from 203-545 trees ha-1 and total basal area from 17.5-71.7 m2 ha-1. The range of species richness of tree layer, shrub layer and herb layer was from 2-14, 1-10 and 4-14 and diversity from 0.693-2.304, 0.514-2.052 and 1.202-2.583, respectively. The distribution pattern of trees, shrubs and herbs shows that the species were evenly distributed in most of the sites and the diversity of the present study area is 7.4. Rhododendron and Taxus, the undercanopy species facilitated the regeneration of Chimnobambusa falcata, while the conversion of lower girth class individuals to higher girth class individuals is steady and progressive. Though, evergreen and deciduous species had good population of seedlings and saplings, but the conversion to next girth class was very poor due to the high anthropogenic pressure. The present study reveals that the forest vegetation in Chenab valley is better than that of other parts of Nanda Devi Biosphere Reserve, for which conservation strategies have been discussed in the paper.

524. **Malhotra, C.L., Balodi, B. & Singh, S. 1985.** "Additional notes on the wild edible plants of India". *J. Econ. Taxon. Bot.* 6(2): 481–482.

Abstract: In the present paper fourteen plants which are added here as wild edible plants of India from Garhwal.

525. **Malhotra, S.K. 1971.** "Studies on the limestone vegetation of Sahasradhara near Dehra Dun (Uttar Pradesh)– An account of the vegetation". *Bull. Bot. Surv. India* 13(3&4): 260–263.

Abstract: The paper gives a brief account of the vegetation of Sahasradhara near Dehra Dun (U.P.). Environmental factors have lso been discussed. Total number of species collected ffrom the area excluding cultigens was 541. Those belong to 387 genera and 98 families. Family Asteraceae dominates with 50 species and is followed by Poaceae with 49 species, Fabaceae with 45 species and Lamiaceae with 26 species.

526. **Malhotra, S.K. 1973.** "Studies on the limestone vegetation of Sahasradhara near Dehra Dun- Phytosociological studies: Importance Value Index". *Indian Forester* 99(2): 102–115.

Abstract: The average relative frequency, relative density, relative dominance and the importance value of the dominant and co-dominant species in the different habitats of Sahasradhara area have been discussed.

527. **Malik, V. 2015.** "A checklist of grasses (Poaceae) of Saharanpur Forest Division". *Indian J. Fundamental & Appl. Life Sci.* 5(2): 74–80.

Abstract: This paper gives an account of 142 species of grasses belonging to 74 genera of Saharanpur (U.P.). This area is represented by 8 subfamily and 16 subtribes of family Poaceae. Subfamily Panicoideae (99 species) had the highest number of species followed by Chloridoideae (22 species), Pooideae (7species), Bambusoideae (5 species), Ehrhartoideae (4 species), Arundinoideae (3 species), Centothecoideae (1 species) and Aristidoideae (1 species). While subfamilies like Anomochlooideae, Danthonioideae, Pharoideae, and Puelioideae are not represented in this area.

528. **Malik, V., Kumar, D. & Mohammad, I. 2012.** "Weed flora of Muzaffarnagar district (U.P.)". *Ann. Forest.* 20(1): 97–104.

Abstract: The paper gives an account of 138 weed species belonging to 99 genera and 35 families of Muzaffarnagar district (U.P.) collected from fifferent localities. Out of these 98 are dicot and 40 are monocot. Poaceae and Asteraceae were found to be the most dominant families.

529. **Malik, V., Kumar, D. & Mohammad, I. 2013.** "Trees and shrubs of Muzaffarnagar district, Uttar Pradesh". *J. Non-Timber Forest Prod.* 20(1): 143–150.

Abstract: In this paper a total of 286 trees, shrubs and climbers belonging to 69 families and 204 genera have been enumerated from Muzaffarnagar district of Uttar Pradesh.

530. **Malik, Z.A. & Bhatt, A.B. 2015.** "Phytosociological analysis of woody species in Kedarnath Wildlife Sanctuary and its adjoining areas in Western Himalaya, India". *J. Forest & Environm. Sci.* 31(3): 149–163.

Abstract: The aim of the present study was to assess the variation in species composition and diversity of woody species at different altitudes (900 to 2600 m asl) in Kedarnath Wildlife Sanctuary (KWLS) and its adjoining areas in Garhwal Himalaya, India. A total of 94 woody plant species (including 44 tree and 50 shrub species) belonging to 72 genera and 44 families were reported. Density varied from 235 ± 9 to 505 ± 21 trees ha^{-1} and $4{,}730\pm474$ to $9{,}530\pm700$ shrubs ha^{-1}. Total basal cover varied from 10.49 ± 0.66 to 42.92 ± 2.57 m 2 ha^{-1} (trees) and 0.36 ± 0.024 to 0.62 ± 0.047 m 2 ha^{-1} (shrubs). Shannon-Wiener Index fluctuated between 2.30 to 3.53 (trees) and 2.74 to 3.78 (shrubs). Analysis of variance (ANOVA) indicated that altitude and aspect had significant effect on the distribution of woody species. Taxonomically, Rosaceae with 15 species emerged as the dominant family. Low value of maturity index and contiguous distribution of species denoted the early successional status of the studied forests. The conservation assessment based on altitudinal regimes and the information on species structure and function can provide baseline information for monitoring and sustaining the biodiversity.

531. **Malik, Z.A., Bhatt, J.A. & Bhatt, A.B. 2014.** "Forest resource use pattern in Kedarnath wildlife sanctuary and its fringe areas (a case study from Western Himalaya, India)". *Energy Policy* 67: 138–145.

Abstract: The rural population of Himalaya has been strongly dependent on the forest resources for their livelihood for generations. The present study, carried out at three different altitudes of Kedarnath Wildlife Sanctuary (KWLS), explored forest resource-use patterns to understand rural peoples' dependency on the adjacent forests. A total of six forests were selected and the seven dependent villages were surveyed for the study of forest resource use patterns in relation to their socioeconomic status. Average fuelwood and fodder consumption were found to be 2.42 kg/capita/day and 43.96 kg/household/day respectively which was higher than the earlier reported values. Average fuelwood consumption by temporary *dhaba* (roadside refreshment establishments) owners (52.5 kg/dhaba/day) is much higher than the permanent villagers. Average cultivated land per family was less than 1 ha (0.56 ha). Inaccessibility of the area and deprived socio-economic status of the locals are largely responsible for the total dependency of the local inhabitants on nearby forests for fuelwood, fodder and other life supporting demands. Extensive farming of fuelwood trees on less used, barren land and establishment of fodder banks could be the alternative to bridge the gap between the demand and supply. Active participation of local people is mandatory for the conservation of these forests.

532. **Maliya, S.D. 2006.** "The aquatic and wetland flora of Mainpuri district, Uttar Pradesh (India)". *J. Econ. Taxon. Bot.* 30(3): 533–546.

Abstract: The paper presents an account of the aquatic, wetland and marshy angiosperms and pteridophytes of Mainpuri district, Uttar Pradesh. The whole area of present investigation comprises lakes, ponds, tanks, ditches, river and canal banks, low-lying water-logged areas and other wetlands. The present study covers 74 species belonging to 59 genera and 33 families of angiosperms and 4 species belonging to 3 families of pteridophytes. Each species is provided with a brief information on habit, habitat, flowering and fruiting period, distribution and locality of collection. Nomenclature has been brought upto date.

533. **Maliya, S.D. 2012a.** "Additions to the flora of Katarniyaghat Wildlife Sanctuary, Bahraich district, Uttar Pradesh". *J. Econ. Taxon. Bot.* 36(2): 419–426.

Abstract: The paper presents fifty-four additional species collected from the Wildlife Sanctuary Katarniyaghat of district Bahraich after publication of 'A contribution to the flora of Katarniyaghat Wildlife Sanctuary, Bahraich district, Uttar Pradesh. Out of 54 species, belonging to 34 families, 7 species of pteridophytes, 1 species of gymnosperms and remaining all are of angiosperms. Each taxon is updated with correct botanical name, local /vernacular names, locality, habit, habitat, flowering-fruiting period and less-known uses. The present study would be helpful for proper appraisal of plant resources of the protected area and its better management.

534. **Maliya, S.D. 2012b.** "Aquatic and wetland macrophytes of Katarniyaghat Wildlife Sanctuary of Bahraich district, Uttar Pradesh (India)". *J. Econ. Taxon. Bot.* 36(1): 156–165.

Abstract: The paper highlights on 67 species of aquatic and wetland macrophytes recorded in the sanctuary region of Katarniyaghat of district Bahraich. The species belong to a total number of 32 families (25 angiosperms and 7 pteridophytes). Out of 67 species, 62 species are of angiosperms and 5 species of pteridophytes. Some of the species of both groups are used medicinally, for food or vegetable and for improving their economic conditions. Some of the species are also traditionally used for shelter nd other domestic purposes.

535. **Maliya, S.D. & Dutt, B. 2010.** "A contribution to the flora of Katarniyaghat Wildlife Sanctuary, Bahraich district, Uttar Pradesh". *J. Econ. Taxon. Bot.* 34(1): 42–68.

Abstract: The paper presents base-line data on the flora of katarniyaghat Wildlife Sanctuary, Baharaich district, Uttar Pradesh. A total of 409 species belonging to 301 genera and 96 families are included in this updated account. Each taxon is provided with correct binomial name, local name(s), habit, habitat, flowering-fruiting period and less known uses. 170 species are additions to the flora of Bahraich district. The study is an additional contribution towards the writing of a Flora of the area, which will be helpful for proper appraisal of plant resources of the protected area and its better management.

536. **Maliya, S.D. & Singh, S.M. 2004.** "Diversity of aquatic and wetland macrophyte vegetation in Uttar Pradesh (India)". *J. Econ. Taxon. Bot.* 28(4): 935–975.

Abstract: The paper presents the diversity of habitats matched by diversity of aquatic and wetland macrophyte vegetation of Uttar Pradesh. Besides indigenous species, several species have been introduced for different purposes. Some of these species include the world's most troublesome aquatic weeds. Sound growth of such aquatic weeds causes problems of economic and ecological aspects hampering the utility of a water body of its resources. Several native species are grown for ornamental as well as medicinal purposes. Most of the aquatic species are of known usefulness. There has been no detailed study so far on aquatic and wetland macrophyte flora of Uttar Pradesh and hence, the present study has been conducted.

537. **Maliya, S.D. & Singh, S.M. 2008.** "Herbaceous flora of district Mainpuri, Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 32(1): 220–266.

Abstract: The paper presents an account of herbaceous flora of district Mainpuri excluding trees and aquatics. It includes 234 species of angiosperms belonging to family Acanthacee to Zygophyllaceae. The botanical wealth of district Mainpuri has not been explored so far. The status of species, population and ecological diversity is also not known; therefore, the base line information has been generated through this study on the precise number of the plant species and extent of the variations, their identification, abundance, distribution and economic importance.

538. **Manhas, R.K., Gautam, M.K. & Kumari, D. 2009.** "Plant diversity of a fresh water swamp of Doon valley, India". *J. American Sci.* 5(1): 1–7.

Abstract: The present study was conducted in a highly degraded and fragmented swamp of Doon valley, India. A total of 162 plant species were recorded from the swamp. Dicotyledons contributed 71%, monocotyledons 23.5% and pteridophytes 5.6%. Poaceae with 15 genera and 17 species was the most represented family. Biological spectrum of the present study site shows that therophytes were the most dominating life-form of the swamp, representing high anthropogenic disturbance in the region and limited niche space for the vegetation.

539. **Manikandan, R. 2018.** "Contribution to the flora of Sinanadi Wildlife Sanctuary, Uttarakhand- I (Dicotyledons)". *Indian J. Forest.* 41(2): 133–148.

Abstract: The present work on flora of Sonanadi Wildlife Sanctuary, Uttarakhand-Dicotyledons, revealed presence of 477 species including 5 subspecies and 8 varieties under 317 genera belonging to 89 families of angiosperms. The correct binomial name with author citation flowed by specimens examined, herbarium acronyms (within bracket) and local names in italics are provided.

540. **Manikandan, R. & Balodi, B. 2017.** *Flora of Govind Pashu Vihar Wildlife Sanctuary, Uttarakhand.* Botanical Survey of India (In press).

541. **Manikandan, R., Murugan, C., Devi, R.M. & Nithya, S.P. 2018.** "Contribution to the flora of Sonannadi Wldlife Sanctuary, Uttarakhand- II (Monocotyledons)". *Indian J. Forest.* 41(3): 235–240.

Abstract: The present work on monocot flora (Part-II) comprises of 19 families, 89 genera and 123 species of angiosperms. The correct botanical name with author citation followed by specimens examined along with herbarium acronyms (within bracket) and local anmes in italics are provided.

542. **Manral, U., Raha, A., Solanki, R., Hussain, S.A., Babu, M.M., Mohan, D., Veeraswami, G.G., Sivakumar, K. & Talukdar, G. 2013.** "Plant species of Okhla Bird Sanctuary: A wetland of Upper Gangetic Plains, India". *Check List* 9(2): 263–274.

Abstract: The Okhla Bird Sanctuary (OBS), a man-modified floodplain wetland having high human impact, is located in an urbanized landscape. Its location in the Central Asian Flyway of migratory birds makes it an ideal transit and wintering ground for birds. This paper describes the vegetation composition and significance of the Sanctuary as a bird habitat. A floristic survey was carried out from winter 2009 to spring 2010 while preparing a management plan for OBS. 192 species of plants belonging to 46 families were recorded from the area. Thirteen species of weeds were observed covering 70% of the sampled area in peak summer. Among trees, highest density was found for two exotic species viz., *Leucaena leucocephala* and *Prosopis juliflora*. The aquatic system is facing threat from proliferation of *Eichhornia cressipes* and *Typha angustifolia*. Strategic eradication of invasive and plantation of native species in the sanctuary are needed for better management.

543. **Mathur, A. & Joshi, H. 2013a.** "Life forms and biological spectra of the vegetation of Tarai region of Kumaun, Uttarakhand". *Indian J. Forest.* 36(1): 129–133.

Abstract: A study on floristic analysis and ecological assessment of the angiospermic plants in Terai region of Kumaun (Uttarakhand) was conducted during the period 2008 to 2011. The study site included Lalkuan (Nainital district) and Kichha tehsil (covering Pantnagar) of district Udham Singh Nagar as these occupy major part of central Terai. Total 429 angiospermic plant species were recorded for floristic and ecological analysis during study period. The plant species collected through extensive and intensive explorations were under taken in the study area during different seasons (i.e. summer, rainy, winter and spring) of the year in different ecosystem habitats viz., natural forest, plantation, agro-ecosystem, grassland, savanna, amphibious sites (marsh-meadow), wasteland and road sides. Collected species were classified in different life-forms following Raunkiaer and the biological spectrum for different ecological habitats, viz., natural forest, plantation(s), agro-ecosystem, grassland and for the entire study areas as a whole has been developed.

544. **Mathur, A. & Joshi, H. 2013b.** "Studies on the flora of Tarai region of Kumaun". *Indian J. Forest.* 36(4): 529–542.

Abstract: The terai region of Kumaun which represents sub tropical vegetation was explored for the floristic diversity in year 2008-2011. A total of 429 species under 317 genera of vascular plants i.e. angiosperm belonging to 95 families were recorded. These are listed in the present communication.

545. **Mathur, A. & Joshi, H. 2014a.** "Phenological accounts of some important plant species of *Tarai* region of Kumaun, Uttarakhand". *J. Non-Timber Forest Prod.* 21(2): 129–136.

Abstract: The paper presents observations on phenological studies conducted on 112 plant species of tarai region between 2008-2011.

546. **Mathur, A. & Joshi, H. 2014b.** "Some weed species of *tarai* region of Kumaun, Uttarakhand". *J. Non-Timber Forest Prod.* 21(3): 201–206.

Abstract: The present floristic and ethnobotanical studies were conducted in the year 2008 to 2011 in central tarai region. The study site includes, Pantnagar and Kichha tehsil in Udham Singh Nagar and Lalkuan in Nainital district. The exploration was taken in three sites and eight communities in different seasons. During the floristic study, 429 plant species were collected; in which 121 species were weed. In weed species, the number of herb is maximum with 75 followed by grass 18, sedge 17, under shrub 06 and shrub 05 species. The maximum number of weed species was found in Site I i.e. in Pantnagar 121 followed by 83 species in Site II and 82 in Site III Kichha and Lalkuan respectively. The alternative use of weed species was based on oral communication by local as well as migrant people and as cited in literature. The present information on the distribution of various weed species in different habitats, crop fields of the three sites is an important investigation and has an applied significance in effective weed management and crop yield improvement process.

547. **Mathur, H.N. & Soni, P. 1983.** "Comparative account of undergrowth under *Eucalyptus* and Sal in three different localities of Doon valley". *Indian Forester* 109(12): 882–890.

Abstract: In the present paper results of scientific monitoring of ground cover and undergrowth under *Eucalyptus* and Sal-natural/planted at three different sites in Doon valley have been presented. The comparison of *Eucalyptus* with sal has been done, because Sal is an indigenous species occurring naturally in large parts of Doon valley.

548. **Mehrotra, B.N. 1978.** *The Flora of Mandakini valley (Garhwal Himalayas).* Ph.D. Thesis, Lucknow University, Lucknow. (unpublished).

549. **Mehrotra, B.N. & Aswal, B.S. 1985.** "The flora of Mandakini Valley (Garhwal Himalaya)". *J. Econ. Taxon. Bot.* 6(3): 579–627.

Abstract: The present communication is an account of the flowering plants collected from Mandakini valley (Garhwal Himalaya) during the period 1972-1977. A total number of 1002 taxa representing 565 genera 132 families of angiosperms and gymnosperms are enumerated. Notes on the route, climate, soil and geology, previous botanical work and vegetation of the valley are also provided.

550. **Melkania, N.P. 1989.** "On the phanerogamic parasites in Central Himalaya". *J. Econ. Taxon. Bot.* 13: 231–235.

Abstract: The present communication deals with the parasitism and wide range of host species of angiospermic parasites, viz., *Cuscuta europaea* L., *C. reflexa* Roxb., *Scurulla alata* (Edgew.) Danser, *S. cordifolia* (Wall.) G. Don, *Taxillus vestitus* (Wall.) Danser and *Viscum album* L. Out of 47 plant species of 32 genera, 13 species were infested by *Cuscuta* spp., 20 species by *Scurulla* spp., 4 species by *Taxillus vestitus* and 10 were infested by *Viscum album*. The parasitism can be termed as 'diffuse or cosmopolitan'. The maximum infestation was recorded on the members of Rosaceae (12) followed by Cupuliferae (5) and Urticaceae (4). Detaisl on the extent of parasitism and the parts of the host plants affected by the parasites have been presented. Physical removal of parasites at initial stage of infection is recommended as the simple control measure.

551. **Melkania, N.P. 1990.** "Ecology and systematics of vegetation of Almora– 1. The rainy season plants". *J. Econ. Taxon. Bot.* 14(2): 249–261.

Abstract: In the present communication an attempt has been made to enumerate the rainy season plants, as a part of the study in the 'Ecology and Systematics of the vegetation of Almora'. The relative abundance and scarcity, phenology and monthly incidence, etc., of 233 species representing 179 genera from 67 families have been recorded. The ratio between monocots and dicots was found 1: 0.1555 at the family, 1: 0.104 at genera level and 1: 0.109 at the species level. Families, viz. Asteraceae, leguminosae, Lamiaceae, Scrophulariaceae and Solanaceae were found common during rainy season.

552. **Melkania, N.P. & Sharma, S.D. 1980.** "On the taxonomic enumeration of the way side flora of Almora district". *Environm. India* 3: 18–26.

553. **Melkania, N.P. & Singh, J.S. 1983a.** "Wall flora of Almora". *J. Econ. Taxon. Bot.* 4(3): 941–949.

Abstract: In the present communication a total of 145 species belonging to 56 different families of cryptogams and phanerogams have been recorded from the various walls

of Almora (municipal limit). 104 species were recorded in the rainy season, 53 species in the winter and 53 in summer. Asteraceae occupies top position among dominant families occurring in the area.

554. **Melkania, N.P. & Singh, J.S. 1983b.** "Weeds of Himalaya in winter crop". *Indian J. Weed Sci.* 15(1): 38–42.

Abstract: The present communication is an account of weed flora in winter crops of Western Himalaya (Kumaon and Garhwal), ranging from outer foot-hills to sub-alpihe regions (altitude 700 m to 3,150 m above MSL). Out of 39 species, 34 species of 30 genera of 15 families belong to dicots and 5 species of 4 genera belong to 1 monocot family. Asteraceae (7), Brassicaceae (5), Poaceae (5), Leguminosae (4) and Papaveraceae (3) contribute about 61.54% to the total weed species. The associations of weeds in different crops have been emphasised with respect to phenology, habit and occurrence. The increasing intensity of the weeds can be prevented by uprooting them before the crop matures.

555. **Mishra, A., Mishra, L., Sharma, C.M. & Baduni, N.P. 2003.** "Community structure, tree diversity and soil characteristics of a submontane forest of Garhwal Himalaya". *Indian J. Forest.* 26(2): 180–187.

Abstract: The community structure, tree diversity and physicochemical properties of soil in the West Gangetic Moist Mixed Deciduous Forest have been studied on four different slope aspects, viz., North-East, North-West, South-East and South-West in the fotthill region of Garhwal Himalaya. The northern aspects were species rich, well stocked and dense as compared to southern aspects. However, *Garuga pinnata* (TBC= 19.27 m^2/ha and tree volume 2034.7 m^3/ha) and *Lagerstreomia parviflora* (TBC= 14.34 m^2/ha and tree volume 1298.5 m^3/ha) were the single dominant species on the Se and SW aspects respectively. The lowest concentration of dominance value (0.2517) was observed on the NW aspect, where maximum diversity (2.1239) persisted, on the other hand highest cd value (0.3646) was recorded on the SE aspect, where minimum diversity (1.5164) existed. The soil was almost neutral (pH range from 6.5 to 7.3) in these forests with minimum organic carbon (average 1.19±0.56%) and available nitrogen (average 0.576±0.868%) contents prevalent on SE aspect.

556. **Mishra, P.N. & Singh, S.D. 2008.** "Weed flora of rice fields in Azamgarh district (Uttar Pradesh)". *Phytotaxonomy* 8: 54–57.

Abstract: Azamgarh district is situated in eastern part of Uttar Pradesh, covering an area of 4153 sq. km. The rice is one of major crops and cultivated in almost every village of Azamgarh district. The present study on rice field weeds covers 92 species of angiosperm belonging to 65 genera and 31 families of angiosperm. The present work is intended to serve those who are concerned with the management and control of rice field weeds.

557. **Mishra, S. & Narain, S. 2010.** "Floristic and ecological studies of Bakhira wetland, Uttar Pradesh, India". *Indian Forester* 136(1): 375–381.

Abstract: The present paper provides an enumerative account of the aquatic and marshy plants of Bakhira wetland situated in Sant Kabir Nagar. In all 119 species belonging to 79 genera and 42 families have been listed.

558. **Mishra, S. & Narain, S. 2014.** "Aquatic and marshy angiospermic diversity of eastern Uttar Pradesh". *Indian J. Pl. Sci.* 3(2): 63–75.

Abstract: As producers, aquatic and marshy angiospermic plants are most important component in aquatic and wetland ecosystems. It is therefore necessary to record and to assess the diversity and potentiality of these aquatic plant communities. In the present study on aquatic and marshy angiosperms of Eastern Uttar Pradesh, 201 species belonging to 115 genera of 50 families were identified. Out of total 201 species, 107 were dicot species belonging to 65 genera of 33 families while 94 species were monocot belonging to 50 genera of 17 families. During the survey of studied area *Ceratophyllum submersum* L. was first time reported from Gangetic plain. Two species were found to be new record for Uttar Pradesh viz. *Alternanthera philoxeroides* (Mart.) Griseb. and *Synedrella vialis* (Less.) A. Gray while *Ranunculus cantoniensis* DC. was found to be extending its distribution in Uttar Pradesh.

559. **Misra, B.K. & Gaur, A. 2011.** "Floridiversity inside Kanpur Zoological park premises". *J. Econ. Taxon. Bot.* 35(1): 134–149.

Abstract: The paper provides information in nutshell about location, topography and history of the Kanpur Zoological Park, and description of the floridiversity existing inside the ark premises. The descriptive part provides field study characteristics and citation of specimen of 140 plant species, belonging to 120 genera and 52 families of angiosperms.

560. **Misra, B.K. & Verma, B.K. 1992.** *Flora of Allahabad district UP., India.* Bishen Singh Mahendra Pal Singh, Dehradun. Pp. 530.

561. **Misra, O.P. & Joshi, P. 1974.** "An enumeration of grasses of Kumaon and Garhwal divisions and Dehra Dun district in Uttar Pradesh– Part-I". *Indian Forester* 100(12): 736–753.

Abstract: The first instalment of an enumeration of gress of 43 genera and 90 species covering subfamily Panicaceae collected in Kumaon, Garhwal Divisions and Dehra Dun district of Uttar Pradesh has been presented with short notes on each species on habit, habitat abundance, its soil bnding and fodder properties, place of collection (District) with elevation above sea level and field book number of collection.

562. **Misra, V.K. & Sharma, S.C. 2009.** "Studies on aquatic and marshland flora of Gola Gokarannath tehsil in Lakhimpur-Kheri district (U.P.)". *Indian J. Forest.* 32(3): 423–428.

Abstract: The present paper deals with an investigation of aquatic and marshland flora of Gola Gokarannath tehsil. A total of 64 aquatic and marshland species belonging to 104 genera and 54 families are reported from the area. Their ecological classification, phenology and field numbers are also dealt with. On the basis of dominance six associations viz., *Nymphaea-Hydrilla, Nymphoides-Vallisneria, Ludwigia-Scirpus-Eragrostis, Ammannia-Carex-Cyperus, Eleocharis-Cyperus-Scirpus, Limnophila-Cyperus-Ludwigia* are observed in aquatic and marshland vegetation of the study area.

563. **Mitra, M., Kumar, A., Adhikari, B.S. & Rawat, G.S. 2013.** "A note on transhumant pastoralism in Niti valley, Western Himalaya, India". *Pastoralism: Res. Policy Practice* 3: 29.

Abstract: Pastoralism plays an important role in the ecology of alpine habitats and the economy of rural people in some regions of India. The pastoralists move from lower altitudes of the Himalayas to higher alpine regions in summer and return back to lower altitude villages with the onset of autumn. The forested areas along the routes of transhumant pastoralists are affected by anthropogenic pressures, *viz.* grazing by livestock and tree lopping by the herders for fuelwood. To demarcate such areas and evaluate the effect of anthropogenic disturbances, a preliminary documentation of the routes is needed. Interviews were conducted using semi-structured questionnaires to elucidate the information from herders visiting Niti valley, Western Himalayas. The interviews found that most of these herders had common stopovers following a similar route to the valley from their respective villages. More than 70% of herders made their transit camps at Niti village and adjoining areas. They stay there for a few days and then the majority move on to higher alpine pastures of Geldung. The rest either stay back at alpine areas near Niti or in the alpine areas adjoining Gamsali village. These stopovers are areas which experience maximum anthropogenic pressure during livestock migrations, and the vegetation is the most affected. Documentation of migration routes will help identify such areas of high pressure and develop management plans to minimize the disturbances.

564. **Mittal, R.K. & Sharma, M.R. 1980.** "*Shorea robusta* Gaertn f.– A new host for *Cephaleuros virescens* Kunze". *Indian J. Forest.* 3(1): 5–6.

Abstract: Colonization of parasitic algae *Cephaleuros virescens* Kunze over the leaves of *Shorea robusta* has been reported from various nurseries and forests at Dehra Dun.

565. **Mohan, D. 1992.** "Gregarious flowering of *Bambusa arundinacea* Willd. introduced in Shiwalik Forest Division, Uttar Pradesh". *Indian Forester* 118(4): 310.

566. **Mohommad, S. & Joshi, S.P. 2016.** "Angiospermic phytodiversity assessment in forests of Doon Valley, Uttarakhand, India". *Indian J. Forest.* 39(3): 235–243.

Abstract: Phytodiversity assessment in forests of Doon Valley, Uttarakhand, India was conducted. Three Forest Ranges of Dehra Dun Forest Division were extensively surveyed for collection in different seasons. A total of 313 plant species belonging to 235 genera and 71 families were collected and recorded.

567. **Mungali, K. & Joshi, H. 2013.** "Phytoscociological analysis of forest vegetation of Binsar Wildlife Sanctuary, Uttarakhand". *Indian J. Forest.* 36(4): 487–502.

Abstract: Present study was carried out in Binsar Wildlife Sanctuary, Uttarakhand during the period 2006-2007. Phytosociological study of the vegetation was conducted on the basis of floristic and structural variations. The diversity of trees, shrubs and herbs varied with Beats and Compartments. For example in South Binsar Block maximum tree diversity was recorded in Binsar Beat and minimum in Patanainail Beat. In North Binsar maximum diversity was recorded in Dhaulchina Beat and mimimum

in Satri Beat. In Rithagar block the diversity was zero. The maximum value of concentration of dominance for tree layer was observed in Patnainali Beat and mimum in Badaur Beat (in South Binsar). This value also varied with Beats and Compartments of sanctuary.

568. **Munro, W. 1844.** *Hortus Agrensis.* Agra.

569. **Murthy, K.R.K. 2011.** *Floral Gallery of Himalayan Valley of Flowers and Adjacent Areas - A Pictorial Guide.* Published by author, Banglore.

570. **Nadeem, M., Kumar, A., Nandi, S.K. & Palani, L.M.S. 2001.** Tissue culture of medicinal plants with particular reference to Kumaon Himalaya. In: Samant, S.S., Dhar, U. & Palani, L.M.S. (Eds.), *Himalayan Medicinal Plants: Potential and Prospects.* Gyanodaya Prakashan, Nainital. Pp. 258-263.

571. **Nagarwalla, D.J., Chauhan, T.S. & Appachhyan, P. 2001.** Community based conservation in Garhwal. In: Pathak, N. (Ed.), *A Directory of Community Biodiversity Areas in India.* Kalpavriksh, Pune.

572. **Nair, N.C. & Nair, V.J. 1977.** "Present Status and future strategies of floristic studies in India: The Upper Gangetic Plain". *Bull. Bot. Surv. India* 19: 25–32.

573. **Naithani, B.D. 1969.** "Plant collection with the Kedarnath Parbat expedition 1967". *Bull. Bot. Surv. India* 11(3&4): 224–233.

Abstract: The paper gives an account of the collection of plants made by the author whoc was a botanist member of the Kedarnath Parbat Expedition organised by the Gangotri Exploration Committee, Calcutta in September-October 1967. The area under study 30Ú80'-31Ú25' N and 78Ú60'-79Ú45' E and includes the Bhagirathi valley, Gangotri glacier, Tapovan, Sivalinga Base and the glacier regions around Kedarnath Dome covering an altitude range of 1500 m to 5500 m. During the stay with the expedition nearly 1375 species comprising 187 species of flowering plants, 6 species of Gymnosperms and 8 species of Pteridophytes were collected. Notes on the places of special interest are also incorporated in brief in the paper.

574. **Naithani, B.D. 1984-1985.** *Flora of Chamoli, Vol.* I-II. Botanical Survey of India, Howrah.

575. **Naithani, B.D. 1995.** "Botanising the Jadh Ganga valley in Uttarkashi, Garhwal, U.P.; India". *J. Econ. Taxon. Bot.* 19(1): 63–74.

Abstract: The paper gives an account of the recent collections of flowering plants and ferns from the Jadh Ganga Valley, Garhwal Himalaya, Uttar Pradesh, made by the author during July-August 1988, in which nearly 335 gatherings were made which on study yielded 233 species. The area covered by the study lies at 79Ú30' E longitude and 38Ú45' N latitude and includes Jadh Ganga and Nilapani Valley and their neighbouring glacial beds mountain slopes, ranging in altitude between 3000-4500 m.

576. **Naithani, H.B. & Biswas, S. 1992.** "Gregarious flowering of *Dendrocalamus membranaceus*". *Indian Forester* 118(4): 300.

Abstract: Gregarious flowering of *Dendrocalamus membranaceus* has been reported from Forest Research Institute and other localities in Dehra Dun valley in November

1991. Previously flowering of this species was reported from the same locality in 1973.

577. **Naithani, H.B. & Chandra, S. 1998.** "Gregarious flowering of a bamboo *(Drepanostachyum falcatum)*". *Indian Forester* 124(8): 663–664.

Abstract: Gregarious flowering of a *Drepanostachyum falcatum* has been noticed after a gap of 30-35 years in 20 km from Bhatwari to Dabrabni in Uttarkashi district at an altitude between 1500-2000 m.

578. **Naithani, H.B. & Pal, M. 2001.** "Gregarious flowering of bamboo *Dendrocalamus strictus*". *Indian Forester* 127(7): 829–830.

Abstract: Gregarious flowering of *Dendrocalamus tsrictus* has been observed in Compartment No. 4, Shivpuri block, Shivpuri range, Narendra Nagar Forest Division, Tehri Garhwal (Uttaranchal).

579. **Naithani, H.B. & Raizada, M.B. 1977.** "Notes on the distribution records of grasses". *Indian Forester* 103(8): 513–523.

Abstract: The paper presents new distribution records and range extension of 21 taxa of grasses in India. Notes on economic uses are provided; species are arranged alphabetically. Specimens quoted are deposited in Dehra Dun Herbarium (DD).

580. **Naithani, H.B. & Shah, R. 2009.** "Another exotic weed invading Uttarakhand Himalayas". *Indian Forester* 135(9): 1285–1287.

Abstract: An exotic weed *Stevia ovata* Willd. has been observed the mussoorie hills between Mussoorie and Dhanolit which invade the native flora. If timely measures for its iradications are not taken then it will become another obnoxious weed like *Parhenium* and *Eupatorium* and will suppress the native flora.

581. **Naithani, H.B. & Tiwari, S.C. 1982.** "Flowering plants of Pauri and its vicinity". *Indian J. Forest.* 5(2): 142–148.

Abstract: The paper presented a list of about 500 plants belonging to 87 families from Pauri and its vicinity. Phytogeographically it has been defined as a part of Kumaon province.

582. **Naithani, H.B. & Tiwari, S.C. 1983a.** "Flowering plants of Pauri and its vicinity". *Indian J. Forest.* 6(1): 70–74.

Abstract: The paper presented a list of 165 plants belonging to 21 families from Pauri and its vicinity.

583. **Naithani, H.B. & Tiwari, S.C. 1983b.** "Flowering plants of Pauri and its vicinity". *Indian J. Forest.* 6(2): 107–112.

Abstract: The paper presented a list of 160 plants belonging to 27 families from Pauri and its vicinity.

584. **Naithani, H.B., Chandola, S. & Rawat, G.S. 2006.** "Nomenclature and gregarious flowering of Hill bamboo *Sinarundinaria falcata* (Nees) Chao & Renv.". *Indian Forester* 132(9): 1155–1158.

Abstract: Gregarious flowering of *Sinarundinaria falcata* (Nees) Chao & Renv. Is reported from Uttaranchal. Correct nomenclature has been provided and *Arundinaria khasiana* has been merged under *Sinarundinaria falcata*.

585. **Naithani, H.B., Nautiyal, D.P. & Negi, R. 2015.** "Phyto-socialogical analysis and regeneration status of monotypic, endemic tree, *Indopiptadenia oudhensis* in Uttarakhand". *Indian Forester* 141(6): 681–686.

Abstract: *Indopiptadenia oudhensis* is monotypic, endemic species to Western Himalaya and endangered throughout the region. Phyto-sociological analysis of the trees, shrubs and herbs in Champawat Forest Division, Uttarakhand was done and density, diversity index, Importance Value Index etc. were determined for the sites. Higher number of individuals in lower girth classes indicate good regeneration status in the study area.

586. **Naithani, H.B., Pal, M. & Lepcha, S.T.S. 2003.** "Gregarious flowering of *Thamnocalamus spathiflorus* and *T. falconeri,* bamboos from Uttaranchal, India". *Indian Forester* 129(4): 517–526.

Abstract: Genus *Thamnocalamus* belongs to sub-family Bambusoideae. Three species, viz. *Thamnocalamus aristatus, T. falconeri* and *T. spathiflorus* are known under this genus. This paper presents gregarious flowering in year 2002 of *Thamnocalamus falconeri* and *T. spathiflorus* from Uttaranchal, India. These species gregariously flowered after 28-33 years (*T. falconeri*) and 60 years (*T. spathiflorus*). Another twos pecies, viz. *Drepanostachyum falcatum* and *Chimonobambusa anceps* have already completed their flowering cycle in 1998 and 2000 and 1978 respectively. A key to the identification of the species, sub-species and varieties under *Thamnocalamus* is also provided.

587. **Naithani, H.B., Negi, J.D.S., Thapliyal, R.C. & Pokhriyal, T.C. 1992.** "Valley of Flowers: Need for conservation or preservation". *Indian Forester* 118(5): 371–378.

Abstract: The vegetation of Bhyunder valley in the Nanda Devi National Park, situated in the Garhwal Himalaya, is unique and abounding in biological diversity. Proper cataloguing of species diversity is important from the point of view of evolving strategies for the conservation of rare and endangered species. Earlier attempts at listing of species suffer from some glaring omissions which have been highlighted in this paper. A wide variety of herbs which presented a marvel of nature's landscaping when in flowering during the period of summer rains and which attracted treckers from all over the world have dwindled considerably in recent years. The author trace this to the banning of grazing in the valley which has led to overdominance of some faster growing, and taller species resulting in the suppression of a number of less aggressive species. An attempt has been made to underline some factors which might have been responsible for decline in floral diversity.

588. **Narain, S. 2001.** "Notes on the legumes of Hamirpur district (U.P.)". *J. Indian Bot. Soc.* 80: 95–98.

Abstract: Legumes are very economically important group of plants. Bhattacharya & Malhotra (1964) published a list of 406 plants in which legumes are represented by 58 species. In the present study, flora of Hamirpur district has highest population of Legumes. It is represented by 101 species belonging to 49 genera of which 48 species identified as new additions to the flora of the district including 11 species from forest records. Four legumes found to be new additions to the Bundelkhand region of which two species are new additions to the flora of Upper Gangetic Plain.

589. **Narain, S. 2002.** "Biological spectrum of Hamirpur district (U.P.)". *J. Econ. Taxon. Bot.* 26(1): 219–222.

Abstract: Hamirpur district of Bundelkhand region (U.P.) with 602 species spread over 338 genera and 106 families have been studied. The phytoclimate of the district is therophytic. The spectra of the district is more similar to the western region than the eastern and southern regions.

590. **Narain, S. 2005a.** "Contribution to the flora of Hamirpur district, U.P., India". *J. Econ. Taxon. Bot.* 29(1): 31–37.

Abstract: Hamirpur district of Bundelkhand region (U.P.) with 602 species spread over 388 genera and 106 families have been studied. Out of these 200 species found to be new additions to the flora of hairpur district of which 36 species of 32 genera and 22 families are mentioned in this paper with a brief description, phenology and ecology of each taxon. Remaining additions are published earlier.

591. **Narain, S. 2005b.** "Additions to the grass and sedge flora of Hamirpur (including Mahoba) district, U.P., India". *J. Non-Timber Forest Prod.* 12(4): 199–204.

Abstract: Hamirpur district of Bundelkhand region of U.P. is represented by 41 genera and 63 species of family Poaceae and 5 genera and 30 species of family Cyperaceae. During identification 27 species belonging to 20 genera of these families are found to be new additions to the flora of district. These are mentioned in this paper with a brief description, phenology and ecology of each taxon.

592. **Narain, S. 2006.** "Additions to the aquatic and marshy plants of Hamirpur and Mahoba districts (U.P.), India". *J. Phytol. Res.* 19(1): 135–137.

Abstract: Hamirpur and Mahoba districts of Bundelkhand region U.P. are a rich source of natural water systems like rivers, streams, tributtaries, lakes, ponds and irrigation canals. The districts have 120 aguatic plant species of 88 genera and 48 families of which 19 species are new additions to the area. The enumeration of these plants is given with family, brief description, phenology and ecology of each taxon.

593. **Narain, S. 2009a.** "Additions to the genus *Ipomoea* L. of Hamirpur and Mahoba district (U.P.), India". *Indian Forester* 135(9): 1255–1258.

Abstract: A taxonomic account of the genus *Ipomoea* L. of family Convolvulaceae collected from Hamirpur and Mahoba districts, U.P. is given with up-to-date nomenclature, key for identification, brief description, phenology, locality and field numberof each taxon. The genus in the district is represented by 12 species of which 7 species are new additions.

594. **Narain, S. 2009b.** "Additions to the genus *Eragrostis* P. Beauv. of Hamirpur (including Mahoba) district, U.P., India". *Indian J. Forest.* 32(3): 495–496.

Abstract: A taxonomic account of the genus *Eragrostis* P. Beauv. of family Poaceae in Hamirpur (including Mahoba) district U.P. wit up-to-date nomenclature, key for identification, brief description, phenology and ecology of each taxon is provided. The genus in the district is represented by nine species of which seven species are new additions to the district.

595. **Narain, S. 2010a.** "Changing tree diversity of Bundelkhand region (U.P.), India". *Indian J. Forest.* 33(2): 235–243.

Abstract: Bundelkhand region of Uttar Pradesh comprise with seven districts, viz., Banda, Chitrakoot (separated from Banda), Jalaun, Lalitpur, Hamirpur and Mahoba (separated from Hamirpur). Recently it was re-investigated as district floras and recorded 159 species of trees from the area. Out of which 105 species are recollected and 41 species are found to be common mainly due to their plantation or cultivation for socio-cultural value while 52 species of trees are not collected from any district. The forests have much more pressure for fuel wood and small timber than what they can withstand as a matter of sustained productivity.

596. **Narain, S. 2010b.** "Observations on the flora of Hamirpur and Mahoba districts of Uttar Pradesh, India". *Indian J. Forest.* 33(3): 455–462.

Abstract: The flora of Hamirpur and Mahoba of Bundelkhand region of Uttar Pradesh comprises 603 species of 388 genera belongs to 106 families. The monocots are represented by 132 species of which 93 belongs to Cyperaceae and Poaceae alone. The remaining 39 species are distributed under 17 families. The floristic composition shows that the Leguminosae is the largest family, which is represented by 97 species and 48 genera. Out of 106 families, 50 families are represented by one genus only, in which 40 families are represented by a single species. The ten dominant families comprise 187 genera and 341 species. Vegetation, phyto-geographical affinities and biological spectrum of these districts are discussed in this paper.

597. **Narain, S. & Kanoujia, O.P. 2007**. "Flora of Pratapgarh district (U.P.)– First report". *Fl. & Fauna* 13(1): 17–29.

598. **Narain, S. & Kumar, S. 2008.** "Phytodiversity of Nawabganj Bird Sanctuary, Unnao, Uttar Pradesh, India". *Phytotaxonomy* 8: 76–80.

Abstract: The floristic account and distributional pattern of wetland flora of Nawabganj Bird Sanctuary have been reported. In all 111 species belonging to 67 genera and 40 families have been listed. Ecological classification, phenology, frequency and present status of lake are described.

599. **Narain, S. & Lata, K. 2004.** "Taxonomic account of family Asteraceae in Bundelkhand region (U.P.)". *J. Econ. Taxon. Bot.* 28(2): 274–291.

Abstract: Asteracea is the largest family of dicotyledons in angiosperms. In present, the plant specimen of asteraceae family have been studied from Duthie Herbarium of Allahabad University, Allahabad belonging to the four districts of Bundelkhand i.e. Banda (including Chitrakoot), Jalaun, Lalitpur and Hamirpur (including Mahoba) and compared with the Flora of Upper Gangetic Plain (Duthie 1903-1929). Edgeworth (1852) published a list of 46 species of Asteraceae belonging to 35 genera. Bhattacharyya & Malhotra (1964) published a list of 35 species of Asteraceae belonging to 26 genera. Duthie reported a total of 99 species belonging to 53 genera of Asteraceae out of which 57 species reported from Bundelkhand region. A lsist of plant species of family Asteraceae has been prepared and found some species become rare whereas some are the new additions to the flora of Bundelkhand region (Uttar Pradesh) after Duthie.

600. **Narain, S. & Lata, K. 2006.** "Additions to the family Asteraceae in flora of Gorakhpur". *Indian Forester* 132(11): 1504–1508.

Abstract: This paper gives an enumerative account of 20 species belonging to 14 genera of family Asteraceae which are new additions to the Flora of Gorakhpurensis (U.P.). It provides nomenclature, description, locality and field number of each species collected from Gorakhpur district.

601. **Narain, S. & Mishra, S. 2008.** "A list of aquatic and marshy plants of Bundelkhand region of Uttar Pradesh". *Indian J. Forest.* 31(2): 301–308.

Abstract: The present paper deals with an account of aquatic angiosperms of Bundelkhand region. The plant specimens of aquatic and marshy plants were studied from Duthie herbarium of Botany Department of Allahabad University, Allahabad belonging to four districts of Bundelkhand region i.e. Banda (including Chitrakoot), Jalaun, Lalitpur and Hamirpur (including Mahoba). In all 179 species belonging to 97 genera and 49 families have been recorded. Out of these 30 species were not reported in Flora of Upper Gangetic Plain (Duthie, 1903-1923).

602. **Narain, S. & Ranjan, V. 2007.** "Flora of Bundelkhand region of Uttar Pradesh (Family Ranunculaceae–Elatinaceae)". *Fl. & Fauna* 13(2): 273–280.

Abstract: The Bundelkhand region of Uttar Pradesh includes seven districts as Banda, Chitrakoot, Hamirpur, Mahoba, Jalaun, Lalitpur and Jhansi. Flora of Bundelkhand region comprises more than 1000 species. Out of these 47 species of 33 genera and 19 families are enumerated from Ranunculaceae to Elatinaceae. The enumeration includes upto date nomenclature, brief description, distribution, habitat, phenology, ecology, locality, field numbers and the names of the plants collectors.

603. **Narain, S. & Singh, P.K. 2016.** "New addition to the family Asteraceae in flora of Allahabad, Uttar Pradesh". *Bio Bull.* 2(1): 118–120.

Abstract: During the reinvestigations of family Asteraceae in Uttar Pradesh, we have collected and identified 70 species of 50 genera. Out of these three species viz. *Cichorium intybus, Elephantopus scaber* and *Glossocardia bosvallea* are collected from different localities of Allahabad district which are new additions to the flora of Allahabad. In these *Cichorium intybus* growing common while *Elephantopus scaber* and *Glossocardia bosvallea* are occasional in Allahabad district.

604. **Narain, S. & Singh, Richa. 2008.** "Flora of Bundelkhand region (U.P.)– Family Fabaceae". *J. Econ. Taxon. Bot.* 32(1): 200–219.

Abstract: The plants of the family Fabaceae are compiled from district floras of Bundelkhand region (U.P.). The region includes seven districts, i.e. Banda, Jalaun, Lalitpur, Hamirpur, Mahoba, Chitrakoot and Jhansi. During the study of herbarium specimens of these districts from Duthie Herbarium, Department of Botany, University of Allahabad, family Fabaceae consists 78 species f 36 genera in the Bundelkhand region, while Duthie (1903-1929) included 57 genera and 189 species of family Fabaceae in the flora of Upper Gangetic Plain from this region. The region is represented by 51 herbs, 8 shrubs, 8 climbers and 11 trees of legumes.

605. **Narain, S. & Singh, Richa. 2013.** "The assessment of desertification control by Fabaceae family of Bundelkhand region, U.P. India". *Int. J. Pharma Med. & Biol. Sci.* 2(4): 76–79.

Abstract: Fabaceaus plants play a major role for the land which leads to desert like condition and depleted surface. It is considered as a Bundelkhand region where structural entity on the basis of topographic, climate, soil geography and socio-cultural profile. The floristic assessment provides an overlapping vegetation pattern due to varied ecological and climatic habitat. The vegetation of Bundelkhand region is emphasized by xerophytic adaptations, where some of the common sp. are grown well such as *Abrus precatorious, Aschynomene indica, Alhagi maurorum, Alysicarpus vaginalis, Butea monosperma, Rhynchosia minima, Tephrosia villosa*, etc., this vegetation can help in the development of new vegetation in the desert region.

606. **Narain, S. & Singh, S.M. 2008.** "Aquatic and marshy angiosperms of Sarsainawar wetland of Etawah district, Uttar Pradesh, India". *J. Indian Bot. Soc.* 87(3&4): 157–161.

Abstract: The floristic survey has been carried out to explore the aquatic and marshy plants of Sarsainawar wetland, Uttar Pradesh. This wetland area has contributed to the healthy population of Crane (Sarus). The present paper provides an account of the aquatic and marshy plants in Sarsainawar wetland of Etawah district and lists 101 species of 70 genera and 40 families with their ecological classification, family, habit, phenology and field number.

607. **Narain, S., Verma, B.K. & Pandey, H.P. 2002.** Plant genetic diversity of Hamirpur district (Uttar Pradesh). In: Vij, S.P., Kondo, K., Sharma, M.L. & Gupta, A. (Eds.), *Plant Genetic Diversity: Exploration, Evaluation and Conservation*. Pp. 137–145. New Delhi.

608. **Nautiyal, B.P., Pandey, N. & Bhatt, A.B. 1997a.** "Analysis of vegetation pattern in alpine zone in North-west Himalaya: A case study of Garhwal Himalaya with reference to diversity and distributional pattern". *Indian J. Ecol. & Environm. Sci.* 23: 49–65.

609. **Nautiyal, B.P., Pandey, N. & Bhatt, A.B. 1997b.** "Biomass, production potential, dynamics and turnover rate in an Alpine Meadow of North- West Himalaya". *J. Hill Res.* 10 (2): 95–102.

610. **Nautiyal, B.P., Prakash, V. & Chauhan, R.S. 2005.** "Cultivation of *Aconitum* Species". *J. Trop. Med. Pl.* 6: 193–200.

611. **Nautiyal, B.P., Prakash, V. & Nautiyal, M.C. 2000.** "Structure and diversity pattern along an altitudinal gradient in an alpine meadow of Madhyamaheshwar, Garhwal Himalaya, India". *Int. J. Environm. Sci.* 4(1): 39–48.

612. **Nautiyal, D.C. 1996.** *A Taxonomic Survey of Poaceae of Garhwal Himalaya*. Ph. D. Thesis. H.N.B. Garhwal University, Srinagar. (unpublished).

613. **Nautiyal, D.D. & Gupta, B.K. 1989.** "Pollen morphology of some common Dicotyledonous Angiosperms of Doon valley". *Indian J. Forest.* 12(3): 215–223.

614. **Nautiyal, M., Tiwari, J.K. & Rawat, D.S. 2017.** "Exploration of some important fodder plants of Joshimath area of Chamoli district of Garhwal, Uttarakhand". *Curr. Bot.* 8: 144–149.

Abstract: India has more than 13% of the total livestock population of the world, but it does not have specially identified and regularly managed pastures. Although about 12 million ha of the land in the country is officially recorded as the grazing land, a vast majority of the population depends on the forest for fodder. Livestock is

considered as one of the main sources of livelihood, which depends mostly on fodder. Fodder is extracted from forests, grasslands, agricultural land, and agroforestry practices. Agriculture with animal husbandry is the main profession of rural people of this Himalayan region. Livestock plays an important role in the economy of Uttarakhand as it is the important source of income of rural people. There is a vast diversity of fodder plants. Demand for fodder is uniform throughout the year although unavailability of green forage during winter has always remained a serious issue resulting into nutritional deficiency in milching animals. Thus, there is a need to explore fodder plants in Garhwal Himalayas. The present study was conducted to find the diversity of fodder plants and their seasonal availability and mode of use in Chamoli district. The study covers some villages of Joshimath area of Chamoli district of Garhwal which lie in between 30°262 52.373 to 30°332 02.523 N latitude and 79°332 57.563 to 79°412 34.793 E longitude. The survey was conducted in the years 2014 and 2015. Information on locality, mode of use, and seasonal availability was recorded by interviewing the people of the studied villages. The findings recorded 89 fodder species representing trees, shrubs, herbs, grasses, and climbers. During the rainy season, the availability of fodder is in plenty, but there is fodder crisis in other seasons of the year as people are not aware of scientific conservation of grasses for lean periods. It was observed that more fodder species are needed to be planted to increase the fodder availability in the area.

615. **Nautiyal, M., Tiwari, P., Tiwari, J.K. & Rawat, D.S. 2018.** "Fodder diversity, availability and utilization pattern in Garhwal Himalaya, Uttarakhand". *Pl. Archives* 18(1): 279–287.

Abstract: In Garhwal Himalaya, livestock are the important source of income in rural areas. Livestock mostly rely on fodder from forest. The diversity, utilization pattern and season of availability is important to prioritization of fodder species in the area. The present study attempts to enumerate 165 fodder species representing trees (68 spp.), shrubs (28 spp.), herbs (65 spp.) and climbers (4 spp.). Poaceae (27 spp.) and Moraceae (12 spp.) amongst families and Ficus (9 spp.) amongst genera are rich in species. 30 species are used in summer, 32 in winter, 47 in rainy and 28 in all over the year. Herbs are used as fodder mainly in rainy season. Amongst the recorded species 148 species are used as green fodder while 5 spp. as dry species while remaining species are used both as green and dry.

616. **Nautiyal, M.C. & Nautiyal, B.P. 2004.** *Agrotechniques for High Altitude Medicinal & Aromatic Plants*. High Altitude Plant Physiology Research Centre, Srinagar & Bishen Singh Mahendra Pal Singh, Dehradun.

617. **Nautiyal, M.C. & Purohit, A.N. 2000.** "Cultivation of Himalayan Aconites under polyhouse conditions". *Curr. Sci* 78(9): 1062–1063.

618. **Nautiyal, M.C., Nautiyal, B.P. & Prakash, V. 2001.** "Phenology and growth form distribution in an alpine pasture at Tungnath, Garhwal, Himalaya". *Mount. Res. & Develop.* 21(2): 168–174.

Abstract: Studies on phenology and growth form distribution in an alpine pasture of Garhwal Himalaya were undertaken from 1988 to 1998. One hundred seventy-one species were recorded and classified as 5 different growth forms. These species were also classified as early- and late-growing type, on the basis of initiation of their aerial sprouts. Cushion-forming forbs generally emerge as the season commences, that is, immediately after snowmelt. However, the vegetative growth of grasses and other forbs peaked randomly after arrival of the monsoon. Phenophases of different species at higher elevations respond to the availability of the soil moisture and nutrient regimes as well as to temperature and different photoperiodic induction. The spectrum of life forms in the region indicated a hemicryptophytic and geophytic plant climate.

619. **Nautiyal, M.C., Nautiyal, B.P. & Prakash, V. 2004.** "Effect of grazing and climatic changes on alpine vegetation of Tungnath, Garhwal Himalaya, India". *Environmentalist* 24(2): 125–134.

Abstract: Effect of grazing and changing climate on vegetation composition of alpine pasture at Tungnath, Garhwal Himalaya was observed. Growth form pattern and phytosociological attributes were analyzed during 1988 under grazed (exposed to extensive grazing) and ungrazed (protected from grazing) conditions. These observations were repeated during 1998. It was observed that number of early growing species and long vegetative growth cycle species had increased at both sites in 1998 in comparison to 1988. Further, some species, viz., *Poa alpina*, *Polygonum* spp., *Ranunculus hirtellus, Anemone* spp., are predominantly found near the timberline-subalpine region. These species are less palatable and were present at both sites with higher dominance (TBC) and niche width in 1998 indicating wide distribution of the species along an altitudinal gradient. These observations indicated the migration of these species towards upper slopes of alpine. Species diversity was also higher after ten years. However, it is clear that climatic changes alone are not responsible for these vegetational shifts. In fact, human-induced changes are the main reason for habitat destruction and changes in vegetation composition of the alpine region of Garhwal Himalaya. Before final conclusions can be made, long-term studies on vegetation composition and changes are needed, especially in Himalayan region.

620. **Nautiyal, S. 2003.** "Mandakini Valley: Religious, Cultural and Botanical Aspects". *Hima-Paryavaran Newsletter* 14(1&2)-15(1): 14–16.

621. **Nautiyal, S. 2005.** "The oldest *Cedrus deodara* (Deodar) tree in Uttaranchal". *Indian Forester* 131(9): 1249–1250.

622. **Nautiyal, S. & Gaur, R.D. 1978.** "Studies on weed of wheat fields at Srinagar Garhwal". *Bot. Progress* 1: 38–40.

623. **Nautiyal, S. & Kaechele, H. 2007.** "Conserving the Himalayan forests: Approaches and implications of different conservation regimes". *Biodiv. & Conserv.* 16: 3737–3754.

Abstract: The conservation of Himalayan forests is big concern in view of global agenda. Many studies in this endeavor reported that the rate of forests degradation is posing a severe threat to the landscape and existing biodiversity in the Himalayas. Currently there many conservation approaches exists and of them four are widely recognized (1) Conservation through traditional religious beliefs "traditional conserved forests" (TCF); (2) Conservation through governmental planning and schemes

"government conserved forests" (GCF); (3) Conservation through creation of protected areas (PAF); and (4) Conservation through community efforts "community conserved forests" (CCF). Our hypothesis in this direction says that all the conservation approaches lead to same results concerning to forest conservation. To testify our hypothesis we have studied the forests of each conservation regimes and evaluated them based on the identified indicators. We have done empirical studies and following the cloud-free satellite data were used for last three decades (such as Multi-Spectral Scanner, Linear Imaging and Self Scanning, and Enhanced Thematic Mapper) to study a change in vegetation dynamics of the mountain forests in multi-temporal dimension. Our research concluded that community conservation approach have greater significance for biodiversity conservation and management in the Himalayan region. Here we support the model of CCF for forest ecosystem conservation, alongside the sustainable livelihood of the mountain societies. But every conservation regimes has its own importance in viewpoint of the particular objectives. Therefore, we suggests advancement and revision of PAF and GCF however, some elements of CCF can be introduced in TCF for making up it more sound in view of rapid socio-economic and cultural changes taking place in the communities.

624. **Nautiyal, S., Gaur, R.D. & Sharma, M.P. 1979.** "Studies on weeds of paddy fields at Srinagar Garhwal". *Bot. Progress* 2: 59–61.

625. **Nautiyal, S., Nautiyal, P.C. & Gaur, R.D. 1984.** "Weed flora of barley field in Garhwal Himalaya". *Himal. Res. Develop.* 3: 21–22.

626. **Nautiyal, S., Rao, K.S., Maikhuri, R.K. & Saxena, K.G. 2003b.** "Transhumant pastoralism in the Nanda Devi Biosphere Reserve, India– A case study in the Buffer Zone". *Mount. Res. & Develop.* 23(3): 255–262.

Abstract: In the past, transhumant pastoralists in the Indian Himalaya used resources available in various subsystems for their livelihoods. Recent sedentarization of a section of the transhumant pastoralist population resulted in competition with the existing sedentary population for resources in some areas. Resources such as grazing areas and forests are becoming less productive and can no longer cover growing demand (both human and livestock). In the Niti valley (Nanda Devi Biosphere Reserve [NDBR] buffer zone), changes in government policies during the past 50 years have produced a landuse system that is not conducive to traditional transhumant pastoralism. The present article analyzes the impact of loss of grazing area on transhumant pastoralism, the current state of monetary return from livestock rearing, and the output–input ratio in terms of energy currencies in villages inhabited by transhumant pastoralist populations and villages now practicing sedentarized lifestyles. Although small ruminant-dominated animal husbandry is providing monetary benefits to local populations, the system is consuming more resources than it produces in terms of energy currencies. The prospects for transhumant pastoralism in the buffer zone villages of NDBR are discussed.

627. **Negi, B.K. 2018.** "Assessment of forest vegetation and anthropogenic pressure in Ramgarh region of Uttarakhand, West Himalaya". *Indian J. Forest.* 41(1): 61–76.

Abstract: Forest is a complex system, consisting of distinct forest communities, and status of any forest can be recognised by analysing its vegetation. For vegetation analysis phytosociological analysis is the best approach. The present study was carried out at 8 different sites of Ramgarh region using different phytosociological parameters. The results of this study revealed, on the basis of IVI, that five major vegetation types viz., *Pinus roxburghii, Quercus leucotrichophora,* mixed broad leaved, *Quercus floribunda* and *Rododendron arboretum* were dominating this region. The distribution of most of the tree species was random and there was no species having good regeneration status at any site of the region. It is also observed that the anthropogenic disturbance is changing the species richness and diversity of the region. Thus, the conservation and management of these sites are important for the sustainability of forests in the region.

628. **Negi, B.S., Chauhan, D.S. & Todaria, N.P. 2008.** "Comparative plant diversity between Panchayat and adjoining reserve forests in Garhwal Himalaya". *Indian J. Forest.* 31(4): 585–593.

Abstract: A comparative study was conducted on plant diversity in Panchayat forests and their adjoining reserve forests of three districts, viz., Pauri, Chamoli and Rudraprayag Districts of Garhwal Himalaya since April 2003 to December 2004. Total 15 sites were studied which were extending from 840 to 2400 m asl. Extensive pure or mixed Oak and Pine forests characterized most of the sites. Major associations of Quercus leucotrichophora were rhododendron, Myrica esculenta and Lyonia ovalifolia. The species richness was slightly higher in Panchayat forests than adjoining reserve forests. Tree, Shrub and herb density/ha was found almost higher in all reserve forests among all the altitudinal ranges except herb density/ha which was comparatively higher between 1300 to 1800 m asl in Panchayat forests. The species diversity was also higher in reserve forests and follow the trend as Herb>Tree>Shrub.

629. **Negi, C.S. 2007.** "Declining transhumance and subtle changes in livelihood patterns and biodiversity in the Kumaun Himalaya". *Mount. Res. & Develop.* 27(2): 114–118.

Abstract: Trade with Tibet and the factors associated with its maintenance (agriculture and livestock) were the prime occupation of Johaaris and Darmis tribesmen until 1962, when the Sino-Indian war brought an immediate end to this thriving lifeline. The loss of trade brought about drastic changes in the transhumant lifestyle- fewer households arriving at their summer homes, a smaller livestock population, disappearance of traditional handicrafts, and increased exploitation of wild medicinal and aromatic plants (MAPs), with traditional crops being replaced by more remunerative crops such as chives (*Allium stracheyii*) and caraway (*Carum carvi*) as the chief source of livelihood. The present study highlights the causal factors behind changes in the lifestyles of these traditional people in Uttarakhand, India, and the concomitant changes in crop biodiversity and MAPs in the region. It concludes with proposals for possible alternatives for a sustainable future for these people.

630. **Negi, C.S. 2010.** *Askote Conservation Landscape– Culture, Biodiversity and Economy.* Bishen Singh Mehendra Pal Singh, Dehradun.

631. **Negi, C.S. 2013.** Ethno-biological study and conservation of sacred forests towards evolving sound policy initiatives for their eco-restoration. Project Report. GBPIIIERP/ 03-04/05/96. G.B. Pant Institute of Himalayan Environment & Development, Almora.

632. **Negi, C.S. 2014.** *The Sacred Uttarakhand - Ethno-biological study surrounding sacred natural sites in Uttarakhand.* Bishen Singh Mehendra Pal Singh, Dehradun.

633. **Negi, C.S. 2015.** "Developing sacred forests into biodiversity heritage sites- experiences from the state of Uttarakhand, Central Himalaya, India". *Indian J. Tradit. Knowl.* 14(1): 96–102.

Abstract: The provision of declaring Biodiversity Heritage Sites (BHS) in the National Biodiversity Act 2002 provides an opportunity to give recognition to the community initiatives vis-a-vis the institution of the sacred natural sites (SNS). In brief, the salient feature of the Biodiversity Act 2002, as relates to the BHS, is that the state government in consultation with the local bodies may notify in official gazette, biodiversity rich areas, including the SNS as BHS. Subsequently, under sub-section (2) of section 37, the state government in consultation with the Central government may frame rules for the management and conservation of BHS. As per the guidelines framed by the National Biodiversity Authority of India (NBAI), Chennai, for the selection of the sacred natural sites as BHS, and for the constitution of Biodiversity Management Committee (BMC) to manage the BHS, 13 sacred forests across eight hill districts of Uttarakhand were selected. The present paper in brief, attempts to bring forth the salient features of the sacred sites as relates to the precise status of the taboo system or the traditional norms governing the resource utilization, the floral diversity, ecosystem services provided, importance in terms of refuge for wild endangered species of fauna, eco-tourism potential, and else. The paper in addition incorporates the experiences gained in the constitution of BMC, and ends with recommendations as to how to proceed with the establishment of the biodiversity heritage sites vis-a-vis sacred forests.

634. **Negi, C.S. & Nautiyal, S. 2003.** "Indigenous peoples, biological diversity and protected area management– Policy framework towards resolving conflicts". *Int. J. Sustain. Develop. & World Ecol.* 10(2): 169–179.

Abstract: Legal notification of protected area status follows enforcement which, by and large, curtails resource use and means of livelihood, apart from affecting the socio-cultural value system of the local communities, leading to park-reserve-people conflicts. These conflicts are major threats to biodiversity consen'ation in developing countries and call for changes in conventional strategies for conservation planning and management. The attempts to involr.e local communities in protected area management usually fail when initiated and directed by outsiders. This paper deals with the present concept of protected area management and focuses on some of the fundamental issues related to indigenous peoples. It offers principles and options which may be follorved towards resolving the conflicts arising out of such issues.

635. **Negi, C.S. & Nautiyal, S. 2005.** "Phytosociological studies of a traditional reserve forest- Thal ke Dhar, Pithoragarh, Central Himalayas (India)". *Indian Forester* 131(4): 519–534.

Abstract: Traditional reserve forests or sacred forests have in the recent years attracted in the attention of conservation scientists as well as that of wildlife officials, for the reason taht they are the last vestiges of forests which were once in their prime. They are the also remnants of the biodiversity and are zealously guarded by the common village folks, who safeguard these patches of greens, through their own sets of rules, in the form of taboos, religious sanctions and belief systems. Forests being no longer in possession of the villagers, sanction mechanisms have denigrated with the passage of time, as the villagers no longer perceive these forests as belonging to them. However, inspite of the ordeal of the times, there are still few sacred forests, wherein these mechanisms are still enforced. Sacred forest of 'Thal Ke Dhar' is one such forest. Phytosociological study in Tal Ke Dhar sacred forest has been carried out in view to understand the structure, regeneration potential and conservation status.

636. **Negi, G.S. 1994.** "Study of the ancient traditional therapeutic wealth of Pauri and Tehri Garhwal". *Himal. Chem. & Pharmaceut. Bull.* 11: 7–17.

637. **Negi, G.S. 1998.** "Study of the ancient traditional therapeutic wealth of Pauri and Tehri Garhwal- Part-VII (Pauri Garhwal)". *Himal. Chem. & Pharmaceut. Bull.* 15: 33–37.

638. **Negi, G.S. 1999.** "Study of the ancient traditional therapeutic wealth of Pauri and Tehri Garhwal- Part-VIII (Pauri Garhwal)". *Himal. Chem. & Pharmaceut. Bull.* 16: 25–30.

639. **Negi, K.S. 2006.** "*Allium* species in Himalayas and their uses, with special reference to Uttaranchal". *Ethnobotany:* 18: 53–66.

Abstract: Uttaranchal comprises 13 districts of Garhwal and Kumaon region, situated in the centre of the North-West Himalaya. It is a region of rich vegetational wealth and the survival of a wide variety of economically useful endemic wild plants has enriched the genetic resource base and also a economy of natives. The natives continue to cultivate wild and economically useful *Allium* species in their kitchen gardens, dooryards and backyards. During 1986-2005, from an agricultural, horticultural and ethno-botanical exploration and collection mission in the hilly districts of Uttaranchal, some wild species of *Allium* L. were collected and maintained in *ex-situ* filed gene bank for further multiplication, characterization, utilization and conservation. Field work among the natives in Uttaranchal, survey of a few tribal markets and scrutiny of some relevant literature hve brought on record wild species of *Allium*. Until recently, despite its importance for food, medicines, spices and condiments, little systematic and ethnobotanical study on the collection and conservation of these species has been undertaken.

640. **Negi, K.S. & Pant, K.C. 1993.** "Genetic wealth of agri-horticultural crops, their wild relatives, indigenous medicinal and aromatic plants of U.P. Himalaya". *J. Econ. Taxon. Bot.* 18(1): 17–41.

Abstract: This report enumerates in brief the contribution to the major plant genetic resources on agri-horticultural, semi-domesticated crops, their wild relatives, indigenous cultivated medicinal and aromatic plants of which rich diversity occurs in U.P. Himalaya. It extends between 28°43'24" to 31°27'05" N latitudes and 77°34'27" to 81°02'22"

E longitudes, covering an elevation range of 50 m at the foot hills of Siwalik to 7817 m. A total number of 162 species under 122 genera represented by 53 families have been recorded. The dominant families of genetic wealth are Fabaceae (21), Cucurbitaceae (14), Brassicaceae (12), Poaceae (11), Rutaceae (8), Rosaceae (7), Solanaceae (7), Apiaceae (7) and Amaryllidaceae (6).

641. **Negi, K.S., Gaur, R.D. & Pant, K.C. 1995.** "Biodiversity untapped wealth in Uttarakhand". *Indian Hort.* 40(2): 32–40.

642. **Negi, K.S., Tiwari, J.K. & Gaur, R.D. 1985.** "A contribution to the flora of Dodital– A high altitude lake in Garhwal Himalaya (Uttarkashi), U.P.". *J. Bombay Nat. Hist. Soc.* 82(2): 258–272.

Abstract: The present communication is an account of angiosperms collected from high altitude lake (Dodital) in garhwal Himalaya during the year 1982. Dodital is situated on way to gangotri. The paper enumerates a list of 275 species belonging to 150 genera under 60 families. The dominant families are Ranunculaceae, Rosaceae, saxifragaceae, Asteraceae, Primulaceae, Lamiaceae, Polygonaceae, Orchidaceae and Poaceae.

643. **Negi, K.S., Tiwari, J.K. & Gaur, R.D. 1987.** "A contribution to the flora of Khatling glacier in the Garhwal Himalaya (District Tehri), U.P.". *J. Bombay Nat. Hist. Soc.* 84(3): 585–598.

Abstract: Inspite of several attempts by plant explorers in Garhwal Himalaya, many of the alpine zones have practically remained untouched. Khatling glacier, a botanically little known alpine zone is the source of the Bhillangna river, a tributary to the Ganges in Tehri district, U.P. The article briefly describes the angiosperms collected from Khatling during the years 1984-1985. A total number of 464 species and 286 genera represented by 87 families have been recorded from this area. The dominant families of this zone are Ranunculaceae, Fabaceae, Scrophulariaceae, Rosaceae, Saxifragaceae, Lamiaceae, Apiaceae, Asteraceae, Primulaceae, Polygonaceae, Orchidaceae and Poaceae.

644. **Negi, K.S., Tiwari, J.K. & Gaur, R.D. 1988.** "A contribution to the flora of Khatling glacier in the Garhwal Himalaya (District Tehri), U.P. – 2". *J. Bombay Nat. Hist. Soc.* 85(1): 64–78.

Abstract: Two eighty species belonging to 177 genera under 47 families of plants have been recorded from the Khatling glacier in the Garhwal Himalaya, district Tehri, Uttar Pradesh. Within 280 species, 86 species belongs to monocot and 194 to dicot.

645. **Negi, K.S., Varma, S.K. & Muneem, K.C. 2000.** Himalayan Plant Genetic Resource Activities in Uttar Pradesh Hills. In: Pangtey, Y.P.S. (Ed.), *High Altitudes of the Himalaya* 2: 371–388. Gyanodaya Prakashan, Nainital.

646. **Negi, K.S., Tiwari, V., Mehta, P.S., Rawat, R., Ojha, S.N. & Bisht, I.S. 2016.** "Botanical identity of seasonal flowering plants available and maintained in the home gardens of district Nainital, Uttarakhand". *J. Non-Timber Forest Prod.* 23(2): 89–102.

Abstract: Uttarakhand is a store house of plant genetic resources of several crop groups including ornamentals and seasonal flowering plant species. A wide range of seasonal flowering plants are being grown in the region because of its various and

favourable agro-geo climatic zones. Ornamental plant enhances aesthetic value of our environment. There are 8 developmental blocks and 1082 villages in district Nainital of Uttarakhand. Nainital district, is a part of Kumaun region of Uttarakhand. It lies between 29°0.1' to 29°36'21" N latitude and 78°50'53" to 80°06' E longitude. More than 7.62 lakh population reside in 4064 km^2 of geographical area of district Nainital. The district falls under sub-tropical to temperate zones. During the course of field survey (2013–2015), we came across wide range of seasonal flowering plants mostly belong to exotic origin being grown in the home gardens of natives of the region situated in different agro-ecological niches. The present study highlighted a total of 150 seasonal flowering plants with 120 genera belonging to 50 families. These were arranged alphabetically with botanical names followed by vernacular and trade name, family, origin or native place, nature, season with appropriate remarks of variation in shape, size and colour, method of propagation with economic status.

647. **Negi, K.S., Bhandari, D.C., Pareek, S.K., Muneem, K.C., Sharma, A.K., Shukla, H.Y., Manral, H.S. & Pandey, G. 2010.** Various aspects for development of agro-techniques and cultivaton of threatened and less known medicinal plants. In: Tiwari, L.M., Pangtey, YP.S. & Tewari, G (Eds.), *Biodiversity Potential of the Himalaya*. Gyanodaya Prakashan, Nainital. Pp. 317–350.

648. **Negi, P.S. 1992.** "Economic forest resources of Garhwal-Kumaun Himalayas". *Indian Forester* 118(8): 583–593.

Abstract: The economic forest resources of the Garhwal-Kumaun Himalaya (Uttarakhand) has been explored in the present paper with special reference to medicinal and other economic plants which may be used to boost the economy of the region and in providing local employment. Since the principal climatic factors are influencing mountain vegetation, therefore, the paper also throws light upon those factors whose study would be useful in reflecting more clear and distinctive idea about the areas of the study.

649. **Negi, P.S. 2005.** *Investigation on Ligneous Flora of Doon valley*. Ph.D. Thesis, H.N.B. Garhwal University, Srinagar, (unpublished).

650. **Negi, P.S. 2006a.** "A contribution to woody plant diversity of Doon valley, Uttaranchal (Northwest Himalaya)". *Indian Forester* 132(4): 429–455.

Abstract: Woody plant diversity of Doon Valley in outer Himalaya is represented by 674 taxa, 92 families and 368 genera. Total taxa include 591 trees, 35 shrubs, 12 climbers, 15 palms and 21 bamboos. Out of these, Gymnosperms are represented by 42 species and dicots by 596. Percentage-wise, Dicotyledons hold 88.42 share and Monocotyledons contribute 5.34. Gymnosperms are only 6.24 percent of entire floristic composition. Intrestingly Doon Valley perpetuates suitable climatic condition for luxuriant growth of both tropical species (*Tectona grandis, Shorea* spp., *Phoenix* spp. etc.) and temperate species (*Pinus* spp.). The cosmopolitan structure of flora is created by introduction or invasion of 31.15 % exotics. Significant contribution to local flora is recorded by addition of 258 species to existing literature. Present study also contributes addition of 11 species to the existing list of Forest Research Institute Arboretum plants. Conservation potential and prospects of the flora have been

appraised by identification and listing of 18 species which are declared as threatened in International Union of Conservation of Nature and Natural Resource (IUCN) Red List for the year 2003. Progenitors of 17 cultivated and economic plants have been listed for conservation of genetic resource. During field investigation 13 species have been identified threatened due to habitat loss while 7 species were found threatened due to massive exploitation.

651. **Negi, P.S. 2006b.** "Forest resource of Doon valley and its economic potential for global sustainable development". *J. Econ. Taxon. Bot.* 30(4): 783–794.

Abstract: Economic potential of forest resurces of the Doon valley is explored by collection, identification and listing of 65 medicinal plants; 58 fodder yielding plants; 52 fuel, charcoal and Gun powder yielding plants; 71 fruit (wild and cultivated) and vegetable yielding plants; 41 dye, tannin, resin and gum yielding plants; 54 species suitable for ornamental, road-side and avenue purpose; 14 species suitable for timber; 48species suitable for furniture and agricultural implements; 36 species for fibre, baskets, mats, etc.; 14 oil-yielding plants; 11 poisonous plants; 20 fast growing, copies and other related plants. Detailed floristic appraisal of the valley revealed that woody forest resource is composed of 592 species of tees, 36 shrubs, 14 climbers, 15 palms and 21 species of bamboos. Taxonomically, the flora includes 680 species under 366 genera and 92 families. Dicotyledons represent 87.93% and monocotyledons hold 5.59%. The gymnosperm contributes 6.48% to the entire flora. The existence of 24.89% exotics has created global scenario for economic forest potential and sustainable development. New scope and prospects for economic forest resources developed by identification of additional 261 exotic and indigenous species which are not covered by earlier workers in the local flora.

652. **Negi, P.S. & Gupta, B.K. 1987.** "Forest resource of Surkanda Devi, Garhwal Himalaya, India". *Indian J. Forest.* 10(4): 283–289.

Abstract: A detailed survey of the area has been done to explore the existing flora and to study biotic influence on the forest. This investigation includes two years field exercise to study vegetation and ecological aspects with collection of plants during flowering seasons. In present exploration 152 plant species belonging to 48 families, have been collected and identified. The flora is purely temperate and deeply influenced by biological factors.

653. **Negi, P.S. & Hajra, P.K. 2007.** "Alien flora of Doon Valley, Northwest Himalaya". *Curr. Sci.* 92(7): 968–978.

Abstract: This communication is an attempt to prepare an up-to-date account of alien/ exotic flora of the Doon Valley. Both herbaceous and woody species are considered and their origin, habit, and families are investigated along with the socio-economic and ecological relevance of a few species. During this study, 308 woody and 128 herbaceous exotic species were identified and enlisted from various localities and 37.61% of these are of American origin. Interestingly, the statistical ratio of alien species was 45.69% for woody flora, while it was investigated 19.4% for herbaceous species. This relative proportion of exotic and native elements is irrespective of 28.8% endemic dicot species in Indian Himalaya and 40% exotics in the entire Indian flora.

However, the occurrence of the present share of alien species and their naturalization cannot be considered safe for native and endemic flora. This is especially true of Doon Valley, which is part of the mega Himalayan 'hotspot' belt and is globally designated for priority of conservational activities in India.

654. **Negi, P.S., Gupta, B.K. & Hajra, P.K. 1991.** Ligneous flora of Doon valley: A preliminary survey. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.,* Addl. Ser.] 2: 101–118. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: In the present paper about 400 species of angiosperms (excluding bamboos) and gymnosperms have been reported from Doon valley.

655. **Negi, S.P. 2009.** "Forest cover in Indian Himalayan States– An overview". *Indian J. Forest.* 32(1): 1–6.

Abstract: Globally, there is increasing realization of the dependence of humans on ecosystems and the role by forests in providing important ecosystem services. Forests are the chief source of livelihood in developing countries in general and mountains in particular. The five Indian Himalayan states (Arunachal Pradesh, Himachal Pradesh, Jammu & Kashmir, Sikkim and Uttarakhand) constitutes about 1.84% of the total geographical area of the country. The Indian Himalayan holds key to India's ecological security and is the major provider of various forest roducts and hydropower. The Himalaya is the store house of glaciers which provides perennial river systems for mountain inhabitants as well as millions of people living down stream for settlements, agriculture and industries. Good forest cover in Himalayan states is central to maintain ecological balance and environmental stability as it prevents soil erosion and land degradation. India's National Forest Policy (NFP) of 1988 aims at maintaining 66% of the geographical area in the hills under forests. The present forest cover of 31.05% of the total geographical area of the Indian Himalayan states is way behind the target set by NFP-1988. But to reach the target set by NFP, the area under forest change due to direct and indirect causes. Climate change too has its impact on Himalayan forests resulting in change in forest community structures. Only strategy is to ensure that forests of Himalayan states are not further degraded. Therefore, urgent need is to utilize the forests in a suitable manner with focus on minimum depletion. Union government and the respective state governments must lay special emphasis to mitigates all the threats that result in depletion of forest resources through multi-pronged, long-term and integragred approaches, so that Himalayan forests continue to benefit mankind for the present as well as future generations.

656. **Negi, V.S., Maikhuri, R.K. & Rawat, L.S. 2011.** "Non-timber forest products (NTPFs): A viable option for biodiversity conservation and livelihood enhancement in Central Himalaya". *Biodiv. & Conserv.* 20(3): 545–559.

Abstract: The present study aims to document detail information of some of the selected wild edible having enormous potential for livelihood enhancement and socio-economic development by making a variety of value added products. To this end, some of the wild edibles of central Himalaya were selected and prioritized for harnessing their economic potential along with their detail information in terms of distribution, ethnobiology, phenophases and appropriate time of harvesting so as to make

communities well aware about the resource availability and their harvesting period round the year. The cost-benefit analysis of each value added product prepared from selected wild edibles was worked out in detail and these analyses revealed that total monetary output, as well as the net return, is very high for all value added products prepared. Since wild edible fruits or other edible parts can be collected from wild free of cost except labour is involved in collection of these wild edibles bio-resources. In addition, information on a participatory action research framework & approaches for promoting participatory conservation of these wild edible species were also highlighted for appropriate management of these resources. The present attempt provides a practical example of sustainable utilization of wild edibles, their potential in livelihood improvement of local people, distribution and phenophases and availability in natural conditions, participatory conservation of these wild edibles may help policy planners at the regional and national levels to link livelihood/socio-economic development with conservation.

657. **Osmaston, A.E. 1922.** "Notes on the forest communities of Garhwal Himalaya". *J. Ecol.* 10(2): 129–167.

658. **Osmaston, A.E. 1927.** *A Forest Flora for Kumaon.* Govt. Press, Allahabad.

659. **Pala, N.A., Negi, A.K., Shah, S. & Todaria, N.P. 2013.** "Floristic composition, ecosystem services and biodiversity value of temple landscapes in Garhwal Himalaya". *Indian J. Forest.* 36(3): 353–362.

Abstract: The present study was carried out in six temple forest landscapes in Garhwal Himalayan region of Uttarakhand state in India. The six studied landscapes fall within the four districts of Garhwal Himalaya and are dominated by temperate vegetation. Biodiversity value and ecosystem services provided by these forests are based on both, discussions on local inhabitants and secondary available literature. A total of 257 plant species representing 179 genera belonging to 77 families were recorded from study area. Maximum number of species 119 were present in Anyuiya Devi, whereas lowest 80 were present in Chanderbadni. Out of 201 plant species, having different biodiversity value, 121 are of medicinal importance. Presence of sacred entities has reduced the utilization pressure of resources like fuel wood, fodder and timber from these forests. However, the services provided by these landscapes in the form of ecotourism, cultural and traditional heritage conservation may benefit them in suitable utilization of resources in future.

660. **Pala, N.A., Bhat, J.A., Gokhale, Y., Negi, A.K. & Todaria, N.P. 2013.** "Diversity and regeneration status of Sarkot Van Panchyat in Garhwal Himalaya, India". *J. Forest. Res.* 23(3): 399–404.

Abstract: We investigated the floristic composition, phytosociological and regeneration status of Sarkot Van Panchyat (community forest) in Chamoli district of Garhwal Himalaya. A total of 52 plant species of 46 genera and 26 families were recorded, which included 12 trees, 18 shrubs and 22 herb species. *Quercus leucotrichophora* was dominant tree species in sapling and seedling layers, followed by *Lyonia ovalifolia* and *Rhododendron arboreum*. Out of 12 tree species, 7 species in seedling stage and 8 species in sapling stage were recorded in the study area. The 44.41%

species in the study area showed good regeneration status, 16.66% species were fairly regenerating, and 8.33% species showed poor regeneration status, while 33% species were not regenerating. Number of individuals from lower girth classes (0–10 cm and 10–30 cm) showed decreasing trend with the increase in size of girth class. Shannon index (*H*) for trees, shrubs and herbs was recorded as 1.82, 2.24 and 2.41 respectively. Simpsons index (C_D) was recorded as 0.21, 0.12 and 0.12 for trees, shrubs and herbs respectively. The forest should be divided into compartments for better management purpose and each compartment should be closed for five years to assist regeneration and enrichment planting may also be carried out for sustainable management.

661. **Paliwal, A.K., Gururani, A.K. & Joshi, M. 2009.** "Angiospermic weeds of cropland in Bageshwar district, Uttarakhand". *J. Non-Timber Forest Prod.* 16(2): 151–152.

Abstract: Bageshwar is a small district of the hill-state of Uttarakhand-the 'Abode of Gods', situated in the Northern part of India. Being a hill country side, the main occupation of people here is agriculture and other similar practices. Due to a complete dependence on crop fields the major problems of farmers here include the abundance of weeds plants like *Galinsoga parviflora* Cav., *Parthenium hysterophorus* L. etc. are the obnoxious weeds of this region. This paper describes 37 angiospermic weed plant species found growing in major crop land areas of Bageshwar.

662. **Paliwal, N.K. & Singh, V.P. 1982.** "A contribution to angiospermic flora of Moradabad district, Uttar Pradesh (India)". *J. Econ. Taxon. Bot.* 3: 851–861.

Abstract: A comprehensive account of the angiospermic plants of Moradabad district has been presented as a first report in this paper. The plants were collected during 1977-1981. 477 plants (Dicots. 380:Monocots 97) of angiosperms belonging to 340 genera (Dicots 267: Monocots 73) representing 91 families (Dicots 69 : Monocots 22) have been listed. The ratio of species belonging to Monocot to Dicots is 1:3.8, of genera is 1:3.6 and families is 1:3.1. The Fabaceae and the Poaceae are the largest families in Dicots and Monocots respectively.

663. **Pande, H.C. & Pande, P.C. 2000.** "Hitherto unreported epiphytic habit of some flowering plants". *J. Econ. Taxon. Bot.* 24(2): 265–266.

Abstract: In the present study, the abnormal epiphytic habit of six species of flowering plants is reported for the first time from the Kumaon Himalaya.

664. **Pande, P.C. 1985.** *Flora of Almora District.* Ph.D. Thesis, Kumaun University, Nainital. (unpublished).

665. **Pande, P.C. 1991.** "Observations on the vegetation of Almora district in Western Himalaya". *J. Econ. Taxon. Bot.* 15(3): 539–551.

Abstract: The present paper represents the vegetation of Almora district (Western Hiamalaya). The author undertook the survey and studied the vegetation and flora of the district. Plants were collected in different seasons of the year. Vegetation has been classified into woodlands, uplands, fallow fields, aquatic habitat, etc. Each type of vegetation has been given together with its floristic composition.

666. **Pande, P.C. 2001.** Diversity of Monocotyledonous flora of Almora and Bageshwar

districts (Kumaon Himalaya). In: Pande, P.C. & Samant, S.S. (Eds.), *Plant Diversity of Himalaya*. Gyanodaya Prakashan, Nainital. Pp. 193–210.

667. **Pande, P.C. 2010.** Diversity of Dicotyledonous flora of Almora and Bageshwar districts of Kumaon Hirnalaya. In: Tewari, L.M., Pangtey, Y.P.S. & Tewari, G. (eds.), *Biodiversity Potential of the Himalaya*. Gyanodaya Prakashan, Nainital. Pp. 197–228.

668. **Pande, P.C. & Joshi, G.C. 1984.** "*Opuntia elatior* Mill.– An epiphyte on *Cedrus deodara* (Roxb. ex Lam.) G. Don and *Celtis eriocarpa* Decaisne". *Indian J. Forest.* 7(2): 161–162.

Abstract: *Opuntia elatior* Mill., an xerophytic plant grow terrestrially but hitherto it grows as epiphyte on *Cedrus deodara* (Roxb. ex Lam.) G. Don and *Celtis eriocarpa* Decaisne in Kumaon region.

669. **Pande, P.C. & Joshi, G.C. 1985.** "Further contribution to the host range of *Opuntia elatior* Mill.". *J. Econ. Taxon. Bot.* 7: 219–220.

Abstract: *Opuntia elatior* Mill., an xerophytic plant grow terrestrially but hitherto it grows as epiphyte on *Aesculus indica* (Colebr. ex Camb.) Hook.f., *Lagerstroemia indica* Linn., *Pinus roxburghii* Sarg., *Sapium insigne* Benth., *Toona ciliata* Roem. and *Toona serrata* (Royle) Roem. in forests near Almora, Ranikhet, Khairna, Gangolihat, etc.

670. **Pande, P.C., Kandpal, M.M. & Joshi, G.C. 1987.** "Some more unrecorded hosts of *Opuntia elatior* Mill.". *J. Econ. Taxon. Bot.* 11: 474.

Abstract: In the present paper five plants species as the new hosts of *Opuntia elatior* Mill. Reported from Kumaun hills.

671. **Pande, P.K., Negi, J.D.S. & Sharma, S.C. 2000.** "Species diversity, turnover and resource apportionment among various plant species in Western Himalayan forests". *Indian Forester* 126(7): 727–741.

Abstract: In this paper, species diversity, species turn-over and resources apportionment amongst the various species at selected sites of Western Himalayan forest situated at Sandev, distt. Pithoragarh (U.P.) are described. The whole are divided into four subsites as per their aspect, altitude and vegetation. In general, *Quercus leucotrichophora, Pieris ovalifolia, Rhododendron arboreum, Alnus nepalensis* and *Macaranga denticulate* dominate the site except site-II, where *Pinus roxburghii* forms its community with *P. ovalifolia* and *R. arboreum*. The density value range (plant/100 m^2) was 6.37-12.37 for tree layer; 21-74 for shrubs and 6182-11400 for herb layer. Total basal cover (cm^2/100 m^2) ranged in between 1986-4612 for tree layer; 17-50 for shrubs and 246-497 for herbaceous layer. Diversity index is higher for herbs and lowest for trees. Site-IV is more diverse than of the other sites for trees and shrubs while site-II is more diverse than of the other sites as far as shrubs are concerned. Site-III and IV are the more similar sites whereas Site-I and IV showed least similarity. In general, log and log-normal distribution of species is followed by most of the sites for all the life-forms, which is indicative of higher interspecific competition among the various species at their respective sites.

672. **Pande, P.K., Negi, J.D.S. & Sharma, S.C. 2002.** "Plant species diversity, composition, gradient analysis and regeneration behaviour of some tree species in a moist temperate western Himalayan forest ecosystem". *Indian Forester* 128(8): 869–886.

Abstract: Vegetation composition, species diversity, distribution pattern and other parameters of vegetation analysis along with the population structure and regenearion behavious of some trees species in a Western Himalayan forest of Chakrata Forest Division (Uttaranchal) were studied. The possibility of future composition changes was also explored.

673. **Pande, P.K., Negi, J.D.S. & Sharma, S.C. 2006.** "Plant species diversity and vegetation analysis in moist temperate Himalayan forests". *Indian J. Forest.* 24(4): 456–470.

Abstract: Present study deals with plant species diversity and other parameters on vegetation analysis in moist temperate forest of Kedarnath Forest Division (Garhwal Himalaya). The whole area is divided into 8 subsites as per aspect and altitude (ranging from 1800-2800 m.a.s.l.). Total basal cover ($cm^2/100\ m^2$) ranged from 1519-6556 for trees; 7.24 to 74.33 for shrubs and 205 to 2027 for herbs at various sites. The range for diversity index (Shannon-Wiener Index) was 1.26-2.09 for trees; 0-2.49 for shrubs and 1.45-3.0 for herbs. Diversity index was invariably higher for herbs than of the shrubs and trees. Site-Vi and Site-VIII were most similar sites of the raea. Diversity index increases with decreasing altitude whereas the concentration of dominance showed the reverse trend.

674. **Pandey, N.C., Chopra, N., Joshi, G.C. & Tewari, L.M. 2020.** "Diversity of legumes of Betalghat, Kumaun, Western Himalaya". *Biolife* 8(2): 1–9.

Abstract: The Indian Himalaya is rich in socio-cultural values, biodiversity and having a vast treasure of medicinal plant. Uttarakhand is a part of Indian Himalayan region, has vast number of rivers, tributaries and lakes. Betalghat is ablock of Nainital district located at the bank of river Kosi. The study was conducted to document the diversity ofLegumes of Betalghat, Kumaun, Western Himalaya. Total 127 plants species belonging to 55 genera of differenthabits such as herbs (65 species) dominates the area followed by shrubs (33 species), trees (18 species), and climbers (11 species) were recorded. The preserved plant specimens were deposited in the herbarium division ofthe Department of Botany, D.S.B. Campus, Kumaun University, Nainital.

675. **Pandey, S.K. & Shukla, R.P. 2003.** "Plant diversity in managed sal (*Shorea robusta* Gaertn.) forests of Gorakhpur, India: Species composition, regeneration and conservation". *Biodiv. & Conserv.* 12(11): 2295–2319.

676. **Pandey, S.K. & Shukla, R.P. 2017.** "Population status, regeneration and seed germination of eight legumes of Shorea forest in North- Eastern Uttar Pradesh". *Int. J. Bot. Stud.* 2(4): 4–11.

Abstract: The less disturbed sal forests had considerable number of sprouts/ ramets of leguminous shrubs. Except for *Moghania bracteata* and *Desmodium triangulare*, all other species were quite abundant in less disturbed sal forests. In general, *Moghania*, showed much greater sprouting than *Desmodium* at low disturbance and has maximum number of sprouts/ ramets in most of the observed stands. A few young genets and sprouts of the species also encountered in some safe pockets of highly disturbed sal forests. In general, species with greater sprouting efficiency had lesser percentage of seed germination. High stress (burning) severely affected the ramet proliferation but high disturbance (cutting) favoured the ramet production. In most of the cases, there was significant difference between low and high disturbance or heat stress in terms of number of ramets/ genets and inter- ramet distances along the age series of genets. In most of the cases t- values were differ significantly at < 0.05 P- level (d.f 8) between low/ high disturbance in terms of inter-ramet distance. Germination experiment was performed, under controlled conditions, with seeds of different eight species of *Desmodium* and *Moghania*. These eight species, common associates of sal forest, were germinated under constant darkness and constant light, at room temperatures. The germination process was monitored for 20 days. The germination in most of the species was better in the dark. Differences between the percentage of day- light and dark germinations were significant at < 0.05 P- level for all the species except *M. chappar*. The study on population status and regeneration pattern of these legumes can be used in a multiple of ways including high quality forage to wild animals, contributing rich organic nutrient for rehabilitation to degraded forests and also providing firewood to local people.

677. **Pandey, V. 2018.** "Regeneration status of trees under different disturbances regimes at southern fringe of Corbett National Park of Uttarakhand Himalaya". *Indian J. Forest.* 41(1): 83–94.

Abstract: Increasing anthropogenic pressure and dependence of plant products has led to widespread exploitation of natural forest in Uttarakhand Himalaya. The study area was selected on the southern boundary of Corbett National Park. The objective of the present study was to understand the regeneration status of important tree species in three different types of forests categorised as Highly Disturbed, Moderately disturbed and Least disturbed sites. Total tree density was higher for least disturbed forest and lower for high disturbed forest. The regeneration was poor in high disturbed site compared to least disturbed site. *Mallotus philippinensis* was germinating and growing as a dominant under canopy tree species across all the sites except least disturbed sites. Sal (*Shorea robusta*) regeneration was found to be a serious problem. *Mallotus philippinensis, Aegle marmelos* and *Lagerstroemia parviflora* showed their dominance across all the sites proving broad ecological amplitude and high tolerance against grazing pressure. At highly disturbed sites, species like *Mallotus philippinensis, Diospyros tomentose* and *Lagerstroemia parviflora* were regenerating fairly well with seedlings and samplings but the number of samplings were either less than or equal to adults. Vegetationla parameters showed that protected areas (least disturbed areas) are important for maintaining regeneration and ecosystem.

678. **Pandit, M.K., Bhaskar, A. & Kumar, V. 2000.** "Floral diversity of Goriganga valley in the central Himalayan highlands". *J. Bombay Nat. Hist. Soc.* 97(2): 184–191.

Abstract: An extensive and intensive survey of the floral diversity of the Goriganga valley in the central Himalayan ranges was carried out. About 1081 species of flowering plants belonging to 496 genera and 116 families were recorded. A number of plant taxa were found endemic to the area. The valley was extremely rich in orchid species.

679. **Pangtey, Y.P.S. 1982.** Remarks on High Altitude Flowering Plants of Kumaon Himalaya. In: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalayas*. Puja Publishers, New Delhi. Pp. 333–338.

680. **Pangtey, Y.P.S. (Eds.), 2000.** *High Altitudes of Himalaya,* Vols. I–II. Gyanodaya Prakashan, Nainital.

681. **Pangtey, Y.P.S. 2005.** Studies on Dicotyledonous Flora of Kumaun Himalaya. D. Sc. Thesis, Kumaun University, Nainital. (unpublished).

682. **Pangtey, Y.P.S. & Joshi, S.C. (Eds.) 1987.** *Western Himalaya - Environment, Problems and Development,* Vols I-II, New Delhi.

683. **Pangtey, Y.P.S. & Kishor, K. 2017.** "Orchids not included in Pangtey *et al.* Orchides of Kumaun Himalaya (Uttarakhand)". *J. Non-Timber Forest Prod.* 24(1): 39–42.

Abstract: Eighteen species of orchids belonging to fourteen genera have been reported in this paper which was not reported earlier from Kumaun Himalaya by Pangtey *et al.* (1991) based on published literature. Besides two new combinations i.e. *Peristylus goodyeroides* (D.Don) subsp. *affinis* (King & Pantl.) Pangtey comb. nov. and *Thunia alba* (Lindl.) Rchb.f. subsp. *bracteata* (Roxb.) Pangtey comb. nov. are also proposed.

684. **Pangtey, Y.P.S. & Rawat, G.S. 1987.** "Studies on the wall flora of Nainital". *J. Econ. Taxon. Bot.* 9(1): 209–229.

Abstract: A prelimnary survey of wall flora of Nainital was carried out during last three years. In all 442 plants of pteridophytes and angiosperms belonging to 85 families were found to constitute the wall flora. The wall flora varied considerably in respect to different seasons. The maximum species were found during rainy season followed by summer and winter.

685. **Pangtey, Y.P.S. & Samant, S.S. 1986.** "Some orchids new to the flora of Nainital". *J. Econ. Taxon. Bot.* 11(1): 1–4.

Abstract: Thirteen species orchids have been reported for the first time for the flora of Nainital along with other relevant informations.

686. **Pangtey, Y.P.S. & Samant, S.S. 1987a.** "Some interesting plant records for Nainital". *J. Econ. Taxon. Bot.* 9(2): 481–484.

Abstract: Seven species of flowering plants belonging to six families are reported in this paper as additions to the flora of Nainital.

687. **Pangtey, Y.P.S. & Samant, S.S. 1987b.** "Some orchids new to the flora of Nainital". *J. Econ. Taxon. Bot.* 11(1): 1–4.

Abstract: The collection of thirteen species of orchids from Nainital are interesting addition to the flora of Nainital.

688. **Pangtey, Y.P.S. & Samant, S.S. 1991.** An enumeration of orchids of Nainital. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.,* Addl. Ser.] 2: 149–172. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: In the present study, nearly 70 species of orchids belonging to 36 genera has been reported from Nainital and its adjacent areas.

689. **Pangtey, Y.P.S., Samant, S.S. & Rawal, R.S. 1996.** "Diversity of introduced weeds in the flora of Nainital (Kumaun Himalaya)". *New Botanist* 23: 45–53.

690. **Pangtey, Y.P.S., Samant, S.S. & Rawat, G.S. 1988.** "Contribution to the flora of Pithoragarh district, Kumaun Himalaya". *Himal. Res. Develop.* 7: 24–46.

691. **Pangtey, Y.P.S., Samant, S.S. & Rawat, G.S. 1991.** *Orchids of Kumaun Himalaya.* Bishen Singh Mehendra Pal Singh, Dehradun.

692. **Pangtey, Y.P.S., Semwal, O.P. & Kalakoti, B.S. 1983.** "Monocotyledonous plants of Gopeshwar of Chamoli District- I". *Indian J. Forest.* 6(1): 75–78.

Abstract: This paper deals with the monocotyledonous flora of Gopeshwar and the adjoining areas within 12 km radius. In all 57 species have been recorded from this area. Data on habit, habitat, colour of flowers, flowering and fruiting period along with place of occurrence for each species have also been provided.

693. **Pangtey, Y.P.S., Tewari, L.M. & Thongam, B. 2000.** The Lamiaceae of Uttaranchal: An Enumeration and Distribution. In: Pangtey, Y.P.S. (Ed.), *High Altitudes of Himalaya* 2: 335–348. Gyanodaya Prakashan, Nainital.

694. **Pangtey, Y.P.S., Kalakoti, B.S., Rawat, G.S. & Pande, P.C. 1982.** "Observation on the flora of Pindari area". *Himal. Res. Develop.* 1: 56–60.

695. **Pangtey, Y.P.S., Rawal R.S., Bankoti, N.S. & Samant, S.S. 1990.** "Phenology of high-altitude plants of Kumaun in Central Himalaya, India". *Int. J. Biometeorol.* 34: 122–127.

Abstract: The various developmental stages of 184 species of high-altitude plants were studied during 1987 and 1988 in the Pindari glacial moraine area of Kumaun Himalaya in the Central Himalaya. The initiation of growth was synchronised with the beginning of the spring/or summer temperature rise and snowmelt. In this high-altitude zone, the peaks of various phenophases succeeded one after another over about 4 months from early June to October. It is suggested that the plants complete various growth cycles within a very short period of favourable conditions to ensure the survival of their progeny.

696. **Pangtey, Y.P.S., Semwal, O.P., Kalakoti, B.S. & Rawat, G.S. 1984.** "Monocotyledonous plants of Gopeshwar, Chamoli district– II". *J. Econ. Taxon. Bot.* 5(3): 676–683.

Abstract: Ninety three grasses are reported in this paper from Gopeshwar of Chamoli district of Garhwal Himalaya.

697. **Panigrahi, G. & Rajagopal, T. 1967a.** "Studies on the flora of Allahabad IV & V the family Gramineae- 1 & 2". *Proc. Natl. Acad. Sci., India* 37: 1–20.

698. **Panigrahi, G. & Rajagopal, T. 1967b.** "Studies in the flora of Allahabad - IV. The family

Gramineae 3. I". Proc. *Natl. Acad. Sci., India* B37: 21–50.

699. **Panigrahi, G. & Rajagopal, T. 1968.** "Studies on the flora of Allahabad VI- the family

Gramineae-3. Group Pooideae". *J. Indian Bot. Soc.* 47: 219–246.

Abstract: The paper presents 28 species of the group Pooideae (excluding the tribe Bambuseae) of the family Gramineae with keys to the tribes, genera and species for the flora of Allahabad has been given.

700. **Panigrahi, G. & Saran, R. 1967.** "Contribution to the flora of the Gorakhpur Forest Division, Uttar Pradesh". *Bull. Bot. Surv. India* 9(1-4): 249–261.

Abstract: The paper presents the main features of the geology, topography, climate and vegetation together with floristic analysis of the 313 species collected from the forests of the Gorakhpur forest division. In the enumeration of the species, data on the flowering and fruiting condition and exact localities where it occurs and the field number of the collector, are furnished.

701. **Panigrahi, G. & Saran, R. 1968.** "Contribution to the botany of the Allahabad district, Uttar Pradesh". *Bull. Bot. Surv. India* 10(1): 53–60.

Abstract: A botanical tour in the dry-deciduous forests lying in scattered patches in the southern parts of Allahabad district was undertaken by the senior author between 26.4.1967 to 01.05.1967. The exact localities surveyed during this short tour are Kuraon, Kheri, Mahuli, Etwa-kla, Khamaria, Hariharpur, Rajpur, Meja, Bharatganja, Manda (including Katra Pahar, off Drummondganja in the Mirzapur district) in the south-eastern sector and Bara, Shankargarh, Pratappur (Yamuna bank) in the south-western sector of the district. 172 species belonging to 54 families have been enumerated in the present paper.

702. **Panigrahi, G., Singh, A.N. & Misra, O.P. 1969.** "Contribution to the botany of the Tarai forests of the Bahraich district of Uttar Pradesh". *Bull. Bot. Surv. India* 11(1&2): 89–114.

Abstract: With a view to study the vegetation and flora of the terai forests and grasslands of the Bahraich district of Uttar Pradesh, bordering upon the tracts of forests in the Nepalese territory, three seasonal tours undertaken in this forest division in March and November, 1964 by the senior author and in Fenruary 1965, yielded 530 species of angiosperms and 14 species of pteridophytes as represented by 1076 field numbers of plants. The paper presents an outline of the three classes of forest types, viz., Sal, Miscellaneous and Grass and an analysis of the floristic composition in the Katarniaghat-Dharmanpur-Motipur-Doba-Chakia-Chardha and Bhinga forests which are isolated blocks separated by 8-16 km by intervening tracts of cultivation and grazing grounds, except the forests of Dharmanpur and Motipur, which adjoin.

703. **Pant, P.C. 1986a.** *Flora of Corbett National Park*. Botanical Survey of India, Howrah.

704. **Pant, P.C. 1986b.** "Observations on the vegetation and ecological implications on proposed Jamrani Dam, Uttar Pradesh". *J. Econ. Taxon. Bot.* 8(1): 21–27.

Abstract: The vegetation and a list of 81 plants from Jamrani Dam site-Hairakhan, environs of Khaljhala, Panutha, Pastola and Gola river banks in Nainital district together with some ecological implications of the terrain are being presented in this paper.

705. **Pant, P.C. & Naithani, B.D. 1981.** "Plant exploration in the Ralam Valley, Kumaun Himalaya". *J. Bombay Nat. Hist. Soc.* 78(1): 113–124.

Abstract: Observations on the vegetation of ralam valley and Ralam glacier, in the vicinity of Tibetan border with enumeration and shorter notes on 145 species from collections upto an altitude 4800 m in eastern Kumaon are recorded.

706. **Pant, R. 1987.** "A note on the flowering of *Chimnobambusa jaunsarensis* (Gamble) Bhadur & Naithani from India". *Indian Forester* 113(10): 705–706.

707. **Pant, S. 2012.** "A contribution to the flora of Ramnagar Forest Division in the Bhabar belt of Kumaon". *Indian J. Forest.* 35(1): 55–60.

Abstract: The paper records 378 plant species collected from the Ramnagar Forest Division in the Bhabar belt of Kumaon.

708. **Pant, S. & Samant, S.S. 2006a.** "Diversity, distribution, uses and conservation status of plant species of the Mornaula Reserve Forests, West Himalaya, India". *Int. J Biodiv. Sci. & Manage.* 2(2): 97–104.

Abstract: Assessment of plant diversity of the reserve forests of Indian Himalayan Region (IHR) has received little attention. The present study was conducted in Mornaula Reserve Forest, one of the biodiversity-rich reserve forests of West Himalaya, and examined the diversity, distribution and indigenous uses of economically important plant species. A total 337 species of economic importance, belonging to 111 families and 260 genera have been reported. Of these, there were 75 tree species, 69 shrub species and 193 herbs (including 7 species of pteridophytes). These species have been used as medicine (221 spp.), wild edible/food (114 spp.), fodder (94 spp.), fuel (40 spp.), in religion (12 spp.), in agricultural tools (11 spp.), as timber (9 spp.) and for several other purposes (25 spp.) Among the useful species, 144 species had multiple uses and 193 species had single utility. Two species are recorded in the Red Data Book of Indian Plants as rare-endangered e.g. *Cypripedium cordigerum* (Rare); *Dioscorea deltoidea* (Vulnerable). These and other species have been also categorized as Critically Endangered (3 spp.); Endangered (4 spp.); and Vulnerable (9 spp.), following criteria of the International Union for Conservation of Nature and Natural Resources (IUCN). Comprehensive assessment of biodiveristy will help in the conservation and management planning for the reserve forests of the IHR.

709. **Pant, S. & Samant, S.S. 2006b.** "Orchid diversity in Mornaula Reserve Forest (West Himalaya), India". *J. Orchid Soc. India* 20: 25–29.

710. **Pant, S. & Samant, S.S. 2010.** Floristic diversity of Mornaula Reserve Forest in Kumaun, West Himalaya. In: Tiwari, L.M., Pangtey, Y.P.S. & Tewari, G. (Eds.), *Biodiversity Potential of the Himalaya.* Gyanodaya Prakashan, Nainital. Pp. 229–264.

711. **Panwar, G.S., Srivastava, A. & Srivastava, S.K. 2016.** "Micropropagation of *Pittosporum eriocarpum* Royle– An endangered and endemic medicinal tree of North-West Himalaya". *Indian Forester* 142(8): 769–773.

Abstract: *Pittosporum eriocarpum* (Pittosporaceae), commonly known as agni, is an endangered and endemic species of North-West Himalaya and facing a grim situation in the wild. Bark of the species is widely used for the preparation of traditional medicines for the treatment of narcotic, expectorant, bronchitis as well. Microprogation of the species has been carried out by using the shoot tip explant and 93.54% shooting was reported in MS medium supplemented with BAP (5.7 µM) and NAA (1.59 µM) with 24.6 average number of shoots and 5.8 cm shoot length. The in vitro regenerated shoots were shifted to the rooting medium and quarter-strength basal MS medium fortified with IBA (7.3µM) was observed as the optimum medium for the root induction and 95.78% rooting was reported with 17.4 average numbers of roots and 3.6 cm root length. After proper development of roots (3 weeks) with average root length

3.6 cm, 50 plantlets were washed properly and shifted to polythene bags containing mixture of vermiculite and soil (1:1w/v) and maintained in the green house. Initially the pots were covered by the transparent polythene bags to ensure the required humidity content and watered with ¼ modified Hoagland's solution on alternate day. These acclimatized plants were transferred to the field with survival rate of about 84%.

712. **Panwar, G.S., Srivastava, S.K. & Uniyal, P.L. 2015.** "*In vitro* propagation of *Eremostachys superba* Royle ex Benth.– An endangered, medicinal and ornamental herb of North-west Himalaya". *Med. Pl.* 7(4): 264–271.

Abstract: *Eremostachys superba* is one of the most threatened species of the North-West sub-Himalaya with potential medicinal and ornamental values. Efficient in vitro protocol has been developed for the propagation of *E. superba* from shoot tip explants of seedlings raised *in vitro* from seeds. Shoot organogenesis in shoot tip explants was promoted by inoculating these explants on Murashige and Skoog (MS) medium fortified with cytokinins (BAP, TDZ & Kinetin) and auxin (NAA). The best morphogenetic response (number of shoots per explant, shoot length and frequency of shoot regeneration) was observed when explants were incubated on half-strength MS medium containing BAP (6.6 µM) and NAA (0.53 µM). Multiple shoots were also observed in the full strength MS medium fortified with BAP (6.6 µM) and NAA (0.53 µM), but callusing was also reported in addition to multiple shoots. Well developed *in vitro* raised shoots were shifted to rooting mediums fortified with different concentration of auxins (IAA, IBA & NAA). Best morphogenetic response (100%) was observed in quarter strength MS medium containing IBA (7.36 µM) and 16.4 roots per shoots was reported. In addition to rooting, callusing was also reported at cut ends of shoots in full and half-strength MS medium. Plantlets regenerated *in vitro* were acclimatized in the green house under shade net and were successfully transferred to the open environment.

713. **Panwar, G.S., Chanu, L.I., Srivastava, S.K. & Ambrish, K. 2014.** "A note on SEM studies of leaf, pollen and seeds of the *Eremostachys superba* Royle ex Benth.: A critically endangered medicinal herb". *Indian Forester* 140(3): 302–305.

Abstract: Leaf, pollen and seed morphology of *Eremostachys superba* was studied using scanning electron microscopy (SEM) to facilitate identification of this critically endangered medicinal herb. The SEM analysis of the species showed that the leaf of the species is covered with unicellular sparse indumentum of short or longer simple hairs and more pronounced at the margins. The seeds of *E. superba* are triradiate with triquetrous surface and a tuft of stiff multicellular hairs are present at the apical end. The pollen grains are tricolpate with reticulate surface.

714. **Panwar, P., Punetha, D., Rajput, R. & Shridhar, V. 2018.** "Elemental concentration in particulate matter deposited on sugarcane leaves along an industrial area of Uttarakhand". *Indian J. Forest.* 41(3): 245–253.

Abstract: Particulate Matter (PM) is widely recognised as one of the most severe threats to human health and environment. In the present study, the trace elemental analysis of PM deposited on sugarcane leaves was carried out during the summer and winter season in 2014. Six sampling sites were selected including one control site in the Bhagwanpur industrial area in Uttarakhand. A total of 11 elements (Zn, Pb, Mn, Fe, Mg, Cr, Ni, Ca, Cu, Co and Cd) were analysed using ICP-OES (Inductively Coupled plasma-optical emission spectroscopy). The elemental concentration in the PM deposited on the leaf surface was found to be significantly higher ($p<0.05$) in the affected sites in comparison to control site. The high concentration of metal like lead, chromium, zinc, cobalt, nickel, manganese in the PM/dust, characterise the air quality in the sites which are near to the industrial area. Ca was found to be in a maximum concentration in the particulate load which was followed by Fe, Mg, Zn, Mn, Cu, Pb, Ni, Cr, Ca, Co and Cd. The metal loadings in PM suggest that there is the hig atmospheric deposition due to various industrial and vehicular activities. The main variation in the heavy metals in the sites was due to various industries (cement, textile, brick, klin, rubber, battery recycling factory) and vehicular activity. The mean concentrations of Cd and Cr in the sugarcane leaves were below the tolerance limit as per the Indian and WHO standards. Moreover, metals such as Cu, Fe, Zn, Ni and Pb surpassed these limits.

715. **Parihar, K. & Biswas, S. 1982.** "A note on gregarious flowering in *Aechmanthera gossypina* (Nees) Nees in Sahasradhara and Mussoorie hills, Uttar Pradesh". *Indian J. Forest.* 5: 85–95.

716. **Parker, R.N. 1924.** "Botanical notes on some plants of the Kali valley". *Indian Forester* 50(8): 397–400.

717. **Parker, R.N. 1929.** Cyperaceae. In *Duthie's flora of Upper Gangetic Plain* 3: 320–371.

718. **Parveen, M., Tiwari, P., Rawat, D.S. & Tiwari, J.K. 2017.** "Tree species richness and regeneration pattern along the anthropogenic disturbance gradients in montane forests of Garhwal Himalaya, India". *Pl. Archives* 17(2): 1247–1254.

Abstract: We examined the pattern of tree regeneration of two montane forests across the anthropogenic disturbance gradients in Garhwal Himalaya, Uttarakhand, India. Vegetation data was collected from 60 sample plots using a stratified random sampling technique during the years 2015 and 2016. Circumference (C) was used to differentiate three layers of a species into adults (C > 31.5 cm), saplings (C 10.5–31.4 cm) and seedlings (C< 10.5 cm). A total of 25 tree species belonging to 22 genera and 18 families were recorded in the present study. Species richness at the study sites varied from 7 to 15 species. The proportion of trees (0.90%), saplings (6.80%) and seedlings (92.30%) in both the forests indicated a good regeneration status in general. The increasing trend of density observed from the highly disturbed sites to least disturbed sites in both the studied forests which indicated that the density has negative relation with the anthropogenic disturbances.

719. **Pathak, M.C., Bargali, S.S. & Rawat, Y.S. 1993.** "Analysis of woody vegetation in a high elevation Oak forest of Central Himalaya". *Indian Forester* 119(9): 722–731.

Abstract: A quantitative analysis of woody vegetation in 12 stands of four aspects within an elevational range of 2100-2700 m in Central Himalaya was made. *Quercus floribunda* exhibited absolute dominance in all the aspects. *Rhododendron arboreum,*

Ilex didyrena and Q. *semecarpifolia* were major associates. The total tree basal area ranged from 3898 to 5733 $cm^2/100\ m^2$ and diversity and concentration of dominance of total vegetation from 2.180 to 2.649 and 0.014 to 0.155, respectively.

720. **Pathak, R.P., Manral, K. & Samant, S.S. 1986.** "Screening of glacier flora of Kumaun region for biologically active compounds". *Indian Drugs* 24(2): 74–78.

721. **Patil, R.P. 1960.** "A Key to the genera of common grasses of Lucknow and its environs". *Proc. Indian Acad. Sci.* Sec. B. 51: 122–132.

722. **Patil, R.P. 1963.** "A contribution to the flora of Lucknow". *Bull. Bot. Surv. India* 5(1): 1–35.

Abstract: This is account of the flora of Lucknow and its environs and includes 77 angiosperm families and some 330 species. Hindi plant names current locally and ocal uses of the plants have been given wherer possible. Climate, soil and biotic factors have been discussed in relation to the vegetation. The text is illustrated by eight plant sketches and two graphs on climatic data.

723. **Pearson, G.T. 1869.** *Report on the Forests of Garhwal and Kumaon,* Govt. Press, Allahabad.

724. **Pennell, F.W. 1943.** *The Scrophulariaceae of the Western Himalayas.* Academy of Natural Sciences Philadelphia, Monograph No. 5: 1–163. Philadelphia.

725. **Phukan, S. 2002.** "The genus *Kingidium* Hunt in India". *J. Orchid Soc. India* 16(1-2): 47–54.

Abstract: The genus *Kingidium* has 5 species in India, out of which 2 species are endemic in South India. *Kingidium braceanum* (Hook.f.) Seidenf. is a rediscovery after more than 100 years and forms a new record for India.

726. **Pimenov, M.G. & Kljuykov, E.V. 2003.** "Notes on some Sino-Himalayan species of *Angelica* and *Ostericum* (Umbelliferae)". *Willdenowia* 33(1): 121–136.

Abstract: Based on own field observations and collections as well as on material from various herbaria, Sino-Himalayan species of *Angelica* and *Ostericum* were studied, emphasizing fruit anatomy. *A. indica* from NW Himalaya, Uttar Pradesh, a species allied to *A. glauca*, is described as new to science. Three combinations, *Ostericum longipedicellatum* and *O. muliense*, for two species here transferred to that genus, and *Heracleum oncosepalum*, for a species excluded from *Angelica*, are validated. The known distribution range of the Himalayan A. nubigena is extended to SE Tibet, and, inferred from fruit anatomy, the species is shown to be closely allied to *A. cyclocarpa*. Reconsideration and comparison of Chinese *Angelica* species described by European botanists prior to the mid 1930s and by Chinese botanists in the 1960s finally led to the recognition of new synonyms of *A. duclouxii, A. laxifoliata, A. nitida* and *A. wilsonii.*

727. **Pimenov, M.G. & Kljuykov, E.V. 2004.** "A new look at *Kedarnatha* P.K. Mukh. & Constance (Umbelliferae)". *Feddes Repert.* 115: 230–238.

Abstract: A field investigation of *Kedarnatha sanctuarii* P.K. Mukh. & Constance in its locus classicus and subsequent carpological analysis show the identity of the species and *Trachydium garhwalicum* H. Wolff, described from the same region of Tehri Garhwal (Uttaranchal, India). As this species differs in some essential characters

from *Trachydium, Trachyspermum, Chamaesium, Chamaesciadium, Schulzia,* the genus *Kedarnatha* must be retained, and *Indoschulzia* Pimenov & Kljuykov is to be considered as its latter synonym. A new nomenclatural combination, *K. garhwalica* (H. Wolff) Pimenov & Kljuykov comb. nov. have been proposed to name the type species. *Cortia oreomyrrhiformis* Farille & Malla and *Trachydium hamelianum* Farille & Malla are transferred to *Kedarnatha* [*K. oreomyrrhiformis* (Farille & Malla) Pimenov & Kljuykov comb. nov. and *K. hameliana* (Farille & Malla) Pimenov & Kljuykov comb. nov.]. Two new additional species, *K. meifolia* Pimenov & Kljuykov sp. nova from India and *K. vaginata* Pimenov & Kljuykov sp. nova from Burma, are described. As a result, the genus contains five species, distributed from Himachal Pradesh (India) to Burma.

728. **Pimenov, M.G. & Kljuykov, E.V. 2005.** "New West Himalayan genus of the Umbelliferae, with notes on Tibetan species, described in *Pachypleurum*". *Feddes Repert.* 116(1-2): 80–91.

Abstract: A new genus *Kailashia Pimenov* & Kljuykov [type species *K. xizangensis* (Chang HoTseng & Shan Ren Hwa) Pimenov & Kljuykov, comb. nova, transferred from *Pachypleurum*] and a new species of this genus, *K. robusta* Pimenov & Kljuykov, from the Indian state of Uttaranchal, have been described. Other *Pachypleurum* species, earlier described from the autonomous Chinese region of Xizang, were transferred to *Cortia*. *P. nyalamense* was shown to be identical to *C. depressa*, and for *P. lhasanum* a new combination, *C. lhasana* (Chang HoTseng & Shan RenHwa) Pimenov & Kljuykov comb. nova has been proposed.

729. **Pimenov, M.G. & Kljuykov, E.V. 2009.** "Towards a clarification in the taxonomy of Sino-Himalayan species of *Selinum s.l. (*Umbelliferae) 2– Further studies in *Oreocome* in the Himalayas and adjacent areas". *Willdenowia* 39(1): 93–99.

Abstract: Pimenov M. G. & Kljuykov E.: Towards a clarification in the taxonomy of Sino-Himalayan species of *Selinum s.l.* (Umbelliferae). 2. Further studies in Oreocome in the Himalayas and adjacent areas. in Willdenowia 39: 93–99. Oreocome sect. Evittatae is described as new to science to accommodate the former *Selinum vaginatum* from India and Pakistan and a newly described species, *O. aegopodioides*, from Uttarakhand, India, both without vittae in their mericarps. O. sect. *Oreocome* is enlarged by two species from Afghanistan, the newly described *O. nuristanica*, which is related to *O. candollei* and *O. duriuscula*, which is transferred from *Selinum*. *S. stewartii* from Afghanistan and Pakistan is transferred to *Seseli*. Correspondingly three new nomenclatural combinations, *O. arguta* (for *S. vaginatum* and the conspecific *Levisticum argutum*), *O. duriuscula* and *Seseli stewartii*, are validated. Our analyses revealed, that the genus *Selinum* is entirely absent from the Sino-Himalayan region and adjacent Afghanistan. *Oreocome* in its revised circumscription comprises nine species in two sections.

730. **Polunin, O. & Stainton, A. 1985.** *Flowers of the Himalaya.* Oxford University Press, New Delhi.

731. **Powell, P.B.H. 1875.** Note on the Dehradun Forests. *Indian Forester* 1(1): 21–28.

732. **Prabhu, S.V., Soni, A., Panwar, P. & Shridhar, V. 2016.** "Aerosols characterisation during the holi festival in Dehra Dun: Foothills of the Himalayas, India". *Indian J. Forest.* 39(3): 335–343.

Abstract: In this study, Partisol 2300 speciataion sampler and ICP-OES were used for determining the mass and elemental composition of fime particulate matter ($PM_{2.5}$) during holi festival weeks in 13th March 2014 to 20th March 2014 at Dehra Din, India. Chemical analysis for 15 elements (Fe, Ni, Cr, Mn, Cu, Zn, Cd, As, Pb, Na, K, Al, Mg, Sb and Ca) were carried out with the collected samples (n=8). The order of concentration of chemical species during holi festival days were KFe>Na>Mn>Mg>Cr>Zn> Ca>Al>Cu>As>Pb>Ni>Sb>Cd. Aethalometer was used for determining the Black carbon (BC) concentration and percentage of black carbon contributed by the biomass burning (BB). The average mass concentration of $PM_{2.5}$ and BC during holi festival week, pre-holi (3 days), holi (holi festival days) (2 days) and post-holi (3 days) period was found to be 41.58, 68.61 and 42.96 ug/m^3 and 4.97 ±1.89, 7.61 ± 2.37, 3.20±2.46 ug/m^3 respectively. The percentage of BC contributed of $PM_{2.5}$, BC, surface ozone (O_3), oxides of nitrogen (NO_x) during the sampling period, substantial increase in concentration was observed during Holi from pre-holi period.

733. **Prakash, P. & Paliwal, A.K. 2012.** "Composition, productivity and impact of grazing on the biodiversity of a grazing land in Almora district". *J. Appl. & Nat. Sci.* 4(1): 104–110.

Abstract: Biodiversity of Almora district is heavily affected in the areas with heavy grazing pressure, although moderate grazing enhanced the biodiversity of the area. In the present study site a total of 45 herbaceous species were present and therophytes were dominant among them. Live shoot biomass of plants varied from 175.0A±3.5 to 1862.0A±5.75 kg/ha and 87.0A±3.25 to 1303.0A±7.50 kg/ha in ungrazed and grazed plots respectively. Aboveground primary productivity was significantly higher on control plot (3082.2 kg/ha) over grazed plot (2644.0 kg/ha). The average bite frequency per hour was recorded maximum for goats (1106.5 bite/hr) and least for buffalos (920 bites/hr). The monthly dry matter consumption per animal was amounted to 157.15, 154.51, 68.66 and 61.34 kg for cow, buffalo, sheep and goat respectively under nomadic open grazing. The percent herbage exploitation was observed maximum by sheep (9.82%) and minimum by buffalo (8.75%).

734. **Prakash, V. 1993.** "Notes on the identity and occurrence of true Valerian and Indian allied species". *Ethnobotany* 5: 101–105.

735. **Prasad, B.N., Srivastava, M.N. & Khanna, P. 1987.** "The genus *Cosmarium* Corda from crop-fields of Kumaon hills, U.P., India". *Bull. Bot. Surv. India* 29(1-4): 19–25.

Abstract: The paper presents a resume of earlier work done on algal flora of Kumaon hills (U.P.0 region of the Himalayas and described twenty-five taxa os desmids (Chlorophyceae) belonging to the genus *Cosmarium* Corda collected from different crop-fields situated in Pithoragarh district, Uttar Pradesh. All these taxa are being recorded for the first time from this Himalayan region.

736. **Pundir, Y.P.S. 1981.** "A note on the biological control of *Scurrula cordifolia* (Wall.) G. Don by another mistletoe in Siwalik hills (India)". *Weed Res.* 21: 233–234.

Abstract: Observations made on the hyperparasitism of *Viscum loranthi* Elmer on the parasitic weed *Scurrula cordifolia* (Wall.) G. Don in the Sivalik Hills suggests that the

hyperparasite is providing effective biological control of the latter. Moreover, as the hyperparasite appears to attack only mistletoes, it can probably be introduced with safety into other localities where *S. cordifolia* is spreading.

737. **Pundir, Y.P.S. 1984.** "The range of parasitism of *Cuscuta santapaui* Bannerji & Das in Dehra Dun valley". *Indian J. Forest.* 7(4): 338–341.

Abstract: *Cuscuta santapaui* Bannerji & Das attacks a large variety of plants and its host range, extending from annual to perennial herbs to a large number of shrubs and trees in Dehra Dun valley. It includes 4 primary, 33 secondary and 13 intermediate hosts of *C. santapaui* and these belongs to 44 genera of 27 unrelated families of angiosperms.

738. **Pundir, Y.P.S. 1987.** "Witches' broom on *Acacia catechu* Willd. (Khair tree) in Shiwaliks and Dehra Dun valley". *Indian J. Forest.* 10(1): 70–72.

Abstract: This report is a compilation of the author's preliminary observations on the witches'-brooms and their formation on *Acacia catechu* Willd. (Khair tree) in Shiwaliks and Dehra Dun valley. Witches'-brooms formation is a common symptom of many plants infected by some fungi, insects, mistletoes and viruses etc.

739. **Pundir, Y.P.S. 1989.** "Studies on the Mistletoes of Dehra Dun valley and adjacent places - I. *Viscum loranthii*: Distribution, germination, host specificity and interaction with the host". *Indian J. Forest.* 12(1): 36–39.

740. **Pundir, Y.P.S. 1995.** "Host range of *Scurrula pulverulenta* (Wall.) G. Don (Loranthaceae) from Doon valley and adjacent areas". *Indian J. Forest.* 18(1): 74–79.

Abstract: The present paper reports 82 unrecorded hosts, distributed among 58 genera and 34 plant families, for *Scurrula pulverulenta* (Wall.) G. Don and this brings total number of hosts for the parasite to 131 from Doon valley and adjacent areas.

741. **Pundir, Y.P.S. & Adhin, D. 1981**. "A little known host of *Scurrula cordifolia* (Wall.) G. Don". *Indian J. Forest.* 4(2): 159.

Abstract: *Scurrula cordifolia* (Wall.) G. Don was observed on *Lantana camara* for the first time from Mohand Pass forest, Dehra Dun.

742. **Pundir, Y.P.S. & Adhin, D. 1985.** "Two new hosts of *Scurrula pulverulenta* (Wall.) G. Don from Shiwaliks (India)". *Indian J. Forest.* 8(2): 156–157.

Abstract: *Scurrula pulverulenta* (Wall.) G. Don was observed on two new hosts, viz., *Lantana camara* L. and *Bauhinia vahlii* W. & A. from Mohand Pass forest, Dehra Dun.

743. **Pundir, Y.P.S. & Mishra, A.K. 1990.** "*Cryptolepis buchanani* (Asclepiadaceae)– A new host of *Scurrula pulverulenta* (Wall.) G. Don (Loranthaceae)". *Indian J. Forest* 13(2): 178.

744. **Pundir, Y.P.S., Purohit, M.C. & Kimothi, P. 1994.** "Unrecorded hosts of *Scurrula cordifolia* (Wall.) G. Don. (Loranthaceae) from Doon valley and adjacent areas". *Indian J. Forest.* 17(3): 270.

Abstract: The present paper reports 12 unrecorded hosts, distributed among 10 genera and 10 plant families, for *Scurrula cordifolia* (Wall.) G. Don. and this brings total number of hosts for the parasite to 46 from Doon valley and adjacent areas.

745. **Purohit, A., Maikhuri, R.K., Rao, K.S. & Nautiyal, S. 2001.** "Impact of bark removal on survival of *Taxus baccata* L. (Himalayan Yew) in Nanda Devi Biosphere Reserve, Garhwal Himalaya, India". *Curr. Sci.* 81(5): 586–590.

Abstract: The Himalayan yew (*Taxus baccata* L.) is widely but sparsely distributed along the cool temperate belt between 2600 and 3300 m asl of the Nanda Devi Biosphere Reserve (NDBR), Garhwal Himalaya. Traditionally, the bark of this plant is used for preparing beverages locally called Namkin Chay, medicines and its wood as a timber in various regions of the Himalaya. However, due to its excessive collection for use in anti-tumour and anti-cancer drugs, the population of this species has been reduced to a large extent. A study carried out between April 1997 and October 2000 showed that the trees with average girth of 10–90 cm were damaged through bark-stripping practices. The average consumption and collection of the bark was estimated to be 1.7 kg/family/year in the buffer zone villages of NDBR. It was noticed that the growth and survival of this species declined significantly when the bark was removed beyond a limit of average bark thickness (0.43 cm). Since bark collection is an important traditional activity and directly linked with the health and livelihood of the local people, it cannot be banned or stopped. It is suggested that if barkremoving practices are applied appropriately with minimum depth of 0.2–0.3 cm from around the circumference of the trees (> 40 cm cbh trunk) in a scattered manner, there will be minimum harmful effect on growth and survival of the trees. This paper describes the indigenous uses of Taxus baccata, impact of bark removal on survival and appropriate strategies for conservation/management of this species.

746. **Purohit, A.N. 1977.** "Exploratory survey of floristic pattern in Garhwal Himalaya and a possible adaptability mechanism". *Himalaya* 1: 14–21.

747. **Purohit, A.N. & Dhar, U. 1997.** "Himalayan Tree Diversity– An Update". *Proc. Indian Natl. Sci., Acad.* B. 63(3): 187–209.

Abstract: The Himalayan tree flora represents 28% of the total estimated Indian trees with nearly 40% native elements. The rest are largely common with neighbouring tropical/subtropical areas. Spatial distribution suggests that richness declines westward from central/east (81.2%) to trans/northwest (25.4%). Compared to deciduous trees, evergreens are better represented (52.6%). However, the relative percentage of deciduous taxa increases from east (40.2%) to trans/northwest Himalaya (64.0%). Analysis of rarity indicates that Himalaya supports taxa of restricted distribution and local abundance implying high sensitivity. The structural and functional attributes of trees are reviewed with emphasis of leaf habit. Apart from their potential values, lesser explored trees are discussed in detail. The relative importance of indigenous and slow growing taxa for prosperity is focussed.

748. **Purohit, K.M. & Panigrahi, G. 1982.** "Studies on the distribution of the genus *Spiraea* L. (Rosaceae)". *Bull. Bot. Surv. India* 24: 225–227.

Abstract: Twenty Indian species of *Spiraea* L. (Rosaceae), *sensu stricto*, of which 8 are endemic and restricted to the temperate regions of the Himalayas. Of these, four species have not been collected from the type locality or elsewhere and are known by their type collections only. *Spiraea diversifolia* Dunn, *S. duthieana* Zinserling, *S.*

hypoleuca Dunn and *S. zabeliana* C.K. Schneider from Uttar Pradesh, *S. canescens* D. Don from Utta Pradesh & Jammu & Kashmir, *S. gracilis* Maxim. from Jammu & Kashmir and *S. vaccinifolia* D. Don from Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh and Arunachal Pradesh.

749. **Purohit, K.M. & Panigrahi, G. 1984.** "Nine new species of *Spiraea* (Rosaceae) from the Himalayas". *Bull. Bot. Surv. India* 26(1&2): 76–91.

Abstract: *Spiraea rhamniphylla* allied to *S. vaccinifolia* D. Don from Kumaon, Uttar Pradesh, *S. nayarii* allied to *S. tanguensis* Purohit & Panigrahi from Sikkim, *S. panchananii* allied to *S. duthieana* Zinserling from Pithoragarh, Uttar Pradesh, *S. tanguensis* allied to *S. bellae* Sims from Sikkim, *S. arunachalensis* allied to *S. darjeelingensis* from Arunachal Pradesh, *S. darjeelingensis* allied to *S. micrantha* J.D. Hooer from Darjeeling, West Bengal, *S. subdioica* allied to *S. robusta* Hand.-Mazz. from Bomdila, Arunachal Pradesh, *S. emarginata* allied to *S. gracilis* from Banihal, Jammu & Kashmir and *S. subrotundifolia* allied to *S. bellaea* Sims from Sikkim has been described and illustrated.

750. **Purohit, M.C. 1994.** "Mistletoes and their host diversity of FRI reserve forest". *Ann. Forest.* 2(2): 209–212.

751. **Purohit, M.C. 1998.** "Ecology and damage estimates of *Dendropthoe falcata* (L.f.) Ettingsh. in the forests of Doon valley". *Ann. Forest.* 6(2): 173–176.

Abstract: The semi-parasitic weed *Dendropthoe falcate* was found one of the severe problems in *Shorea robusta* (Sal) forest of Doon valley. Relative humidity was found one of the major factors governing the distribution of the weed, and more than 50% biomass of the valleyfound damaged by the weed.

752. **Purohit, M.V., Bijalwan, R. & Joshi, S.P. 2017.** "Altitudinal gradient: Effectivity in floral diversity in moist temperate forest of Grhwal Himalaya". *Indian J. Forest.* 40(3): 243–254.

Abstract: The present paper reports the results of the intensive investigation carried out in a temperate forest of district Uttarkashi, Uttarakhand, to assess the variations in floristic diversity along with the increasing altitudinal gradient. A total of 436 plant species have been recorded from the forest under study.

753. **Purohit, V.K., Andola, H.C., Haider, S.Z., Tiwari, D., Bahuguna, Y.M., Gairola, K.C. & Arunachalam, K. 2015.** "Essential oil constituents of *Angelica glauca* Edgew. roots: An endangered species from Uttarakhand Himalaya (India)". *Natl. Acad. Sci. Letters* 38: 445–447.

Abstract: The roots of *Angelica glauca* Edgew., a high value critically endangered plant, were collected from two alpine Himalayan locations of Uttarakhand (India). The essential oils were obtained by hydro-distillation, analyzed by gas chromatography (GC) and gas chromatography–mass spectrometry (GC–MS) in order to determine the variation of concentration in their constituents. A total of 26 compounds were identified in both the oils, representing 97.7–98.2 % of total oil compositions. The major components of *A. glauca* oils were characterised as (Z)-ligustilide (40.6–53.0 %), (Z)-butylidene phthalide (20.7–32.8 %), (E)-butylidene phthalide (2.5–5.9 %) and (E)-ligustilide (2.1–2.3 %). Due to the higher relative area quantum of monomeric

lactones (phthalides and ligustilides) in *A. glauca* populations (69.3–90.6 %) growing in Uttarakhand, there is a need to develop propagation protocol for mass multiplication and *in-situ* and *ex-situ* conservation.

754. **Pusalkar, P.K. 2012.** "The *Corydalis nana* complex (Fumariaceae, sect. Latiflorae) in Western Himalaya". *Kew Bull.* 66(4): 545–555.

Abstract: *Corydalis nana* Royle in the western Himalaya is found to be a complex of three species, including two hitherto undescribed. The true *C. nana* is a yellow-flowered species. The most common, greyish-blue or white-flowered species in the Sino-Indo-Nepal Himalaya, hitherto mistaken as *C. nana*, is a new species described here as *Corydalis magni*. An additional related species, *Corydalis devendrae*, characterised by tuberous roots and dorsally wingless/non crestate upper and lower petals is also described and illustrated from Uttarakhand state, India. A table comparing diagnostic characters, along with keys to taxa of the complex and a distribution map, are also included.

755. **Pusalkar, P.K. 2015.** "Redefining *Thylacospermum* and a new tribe Thylacospermeae (Caryophyllaceae)". *J. Jap. Bot.* 90(5): 351–355.

Abstract: A study revealed that the genus *Thylacospermum* Fenzl (Caryophyllaceae) is not monotypic, but includes two distinct species, Himalayan *T. caespitosum* (Cambess.) Schischk. and Central Asian *T. rupifragum* (Kar. & Kir.) Schrenk. Based on morphological characterization and phylogeny evidence, a new tribe Thylacospermeae Pusalkar is proposed as correct placement for the unique high altitude cold desert genus *Thylacospermum* Fenzl of the family Caryophyllaceae.

756. **Pusalkar, P.K. & Singh, D.K. 2008.** "*Cotoneaster garhwalensis* Klotz. *emend.* A. Kumar & Panigr. (Rosaceae)– A new synonym". *Indian J. Forest.* 31(4): 633–635.

Abstract: *Cotoneaster garhwalensis* Klotz. *emend.* A. Kumar & Panigr. is reduced as synonym under *C. duthieanus* Klotz.

757. **Pusalkar, P.K. & Singh, D.K. 2009.** "Lectotypification and status of *Pedicularis oederi* Vahl. var. *heteroglossa* Prain (Orobanchaceae)". *Edinburgh J. Bot.* 67(1): 57–64.

Abstract: *Pedicularis oederi* Vahl var. *heteroglossa* Prain (Orobanchaceae) is raised to species rank and lectotypified, and an emended description provided. This taxon has pink or purple-pink corollas rather than the yellow colour otherwise typical for the *Pedicularis oederi* group of taxa.

758. **Pusalkar, P.K. & Singh, D.K. 2012.** *Flora of Gangotri National Park, Western Himalaya, India.* Botanical Survey of India, Kolkata.

Abstract: Flora of Gangotri National Park provides a detailed floristic account of 982 taxa of pteridophytes (68 species and one variety in 25 genera and 18 families), gymnosperms (11 species and one variety in 7 genera and 4 families) and angiopserms (844 species, 22 subspecies and 35 varieties in 357 genera and 87 families) with identification keys based on easily observable field characters and detailed notes on taxonomy, status, usage and etymology of genus and species names of phanerogams. The description are supported by over 1000 colour photographs and 31 plates of line drawings.

759. **Pusalkar, P.K. & Singh, D.K. 2015.** "Taxonomic Rearrangement of *Arenaria* (Caryophyllaceae) in Indian Western Himalaya". *J Jap. Bot.* 90: 77–91.

Abstract: The genus *Arenaria* L. (Caryophyllaceae) in the Indian Western Himalaya is studied in detail and rearranged. Three genera, namely *Dolophragma* Fenzl, *Eremogone* Fenzl and *Odontostemma* Benth. ex G. Don, which were previously treated as subgenera under the genus *Arenaria*, are here recognized as distinct genera and corresponding species of *Arenaria* are transferred to them. As concluded in phylogenetic studies, subgenus *Eremogoneastrum* Fenzl is treated as a part of the genus *Eremogone* and new combinations are proposed for eight western Himalayan taxa transferred here under the genus *Eremogone*. Species hitherto treated in *Arenaria* subgenus *Arenaria* are retained as it is, except the sole representative of section Compressae McNeill, which is shifted under a newly described monotypic genus *Himgiria*. Similarly, three species hitherto under *Arenaria* subgenus *Solitaria* McNeill now form part of newly described Sino-Himalayan genus *Shivparvatia*. A key to the genera of *Arenaria* and its allies reported from Indian western Himalaya is also provided.

760. **Pusalkar, P.K. & Srivastava, S.K. 2016.** "The genus *Schizotechium* (Caryophyllaceae) resurrected". *Phytotaxa* 252(1): 81–84.

Abstract: Fenzl (1833, 1840) described the taxon *Schizotechium* as a section of the genus *Stellaria* Linnaeus (1753: 421) (Caryophyllaceae Juss.) to accommodate the Himalayan *Stellaria crispata* Wallich ex D.Don (1825: 215) [= *Stellaria monosperma* Buchanan-Hamilton ex D. Don (1825: 215)]. The section was morphologically characterized in having the calix 5-partite, 10 hypogynous stamens, the ovary 2–3-ovulate, (2–)3 styles, the capsule 1(–2)-seeded, and often without a central collumella. Bentham (1862), unaware of raised generic rank for the section by Reichenbach (1841), also pointed out the distinctness of this group, strongly supporting the generic rank. He concluded: "*Schizotechium* Fenzl, although only proposed as a section of *Stellaria* might have perhaps rather more claims than any of the preceding [subgenera/sections of *Stellaria* included in the said paper (Bentham 1862)] to be adopted as a genus. It consists of two Himalayan species with a scandent habit and diffuse panicles, almost as in *Brachystemma* D. Don (1825: 216) and only 3 ovules, of which one ripens. The ovary might thus be supposed to be reduced to uniovulate carpels, and to be brought technically nearer to that of Phytolaccaceae R.Br., but there is no central axis, and a slight comparison of actual specimens at once give the idea that it is an exceptional and irregular reduction in the ovules of a closely compound ovary, and not a normal conformity of the ovules with as many distinct or well-marked carpels. The leaves arrangement, inflorescence, and flowers are in all other respects those of *Stellaria* in which genus we continue to retain *Schizotechium* as a section." Notably, members of *Schizotechium* differ from the other belonging to *Stellaria* by the following characters: sub-scandent habit, occurrence of tuberous or fusiform fleshy roots, large, diffuse, many-flowered panicle of compound cymes, central collumella of capsule extremely reduced or nearly absent and capsule with 1(–2) fertile enlarged seed and rest sterile, undeveloped ovules (Bentham 1862, Edgeworth & Hooker 1872).

761. **Pusalkar, P.K. & Srivastava, S.K. (2016) 2017a.** "New combinations in Western Himalayan flora". *Phytotaxonomy* 16: 26–30.

Abstract: New combinations are for seven Western Himalayan taxa. These include three combinations under *Cynoglossum* L. (Boraginaceae) and one combination each under *Dolomiaea* DC. (Asteraceae), *Koenigia* L. (Polygonaceae), *Rosularia* (DC.) Stapf (Crassulaceae) and *Shangwua* Yu J. Wang, Raab Straube, Susanna & J. Quan Liu (Asteraceae).

762. **Pusalkar, P.K. & Srivastava, S.K. (2016) 2017b.** "Alarming spread of *Rumex nepalensis* Spreng. (Polygonaceae) in Western Himalaya– A cause of concern". *BSI ENVIS Newsletter* 21(2): 4–5.

763. **Pusalkar, P.K., Singh, P., Singh, D.K., Srivastava, S.K. & Dash, S.S. 2017.** *Periglacial Flora of Western Himalaya - Diversity and Vulnerability.* Botanical Survey of India, Kolkata (in Press).

764. **Rai, A., Kulshreshtha, K. & Chandra, P. 2007.** "Vanishing aquatic flora of Lucknow– A status report". *Phytotaxonomy* 7: 60–65.

Abstract: The paper deals with the aquatic vascular plants existing presently in the water bodies of Lucknow district. Many species, which have been reported earlier but have now vanished, are shown separately. *Lemna trisulca* L., has been recorded for the first time. The environmental deterioration caused due to the shrinkage of the water bodies and loss of aquatic flora in Lucknow district is discussed.

765. **Rai, I.D., Adhikari, B.S. & Rawat, G.S. 2010.** "An unique patch of timberline ecotone with three species of Lady's slipper orchids in Garhwal Himalaya, India". *J. Threatened Taxa* 2(3): 766–769.

Abstract: The timberline ecotone experiences a large number of micro-habitats manifested by the action of snow, wind, topography, aspect and anthropogenic pressures and exhibits a sharp ecological gradient of biotic and abiotic components. These changes in micro-habitat, such as compaction of soil, replacement of herbs with grasses and consequent increase in root growth, impede the growth of tree species and affected the sensitive taxa at timberline. During baseline information collection on the structure and composition of timberline vegetation at a timberline ecotone in outer fringes of Kedarnath Wildlife Sanctuary, we came across all three species of *Cypripedium* at a single site, i.e. birch (*Betula utilis*) forest. This is the first report of these three species (*C. cordigerum, C. elegans* and *C. himalaicum*) occurring at a single locality.

766. **Rai, I.D., Adhikari, B.S. & Rawat, G.S. 2012a.** "Floral diversity along sub-alpine and alpine ecosystem in Tungnath area of Kedarnath Wildlife Sanctuary, Uttarakhand". *Indian Forester* 138(10): 927–940.

Abstract: Extensive floristic surveys were carried out at Tungnath area in Kedarnath Wildlife Sanctuary during 2007-2011. During the survey a total of 433 plant species belonging to 234 genera under 71 families were recorded along the sub-alpine and alpine region (2800-3680m amsl). Of which 349, 42, 18, 13, 5, 6 and species were herbs, shrubs, grasses, trees, sedges and climbers, respectively. Among dicotyledonous families Asteraceae was the largest family represented by 42 species followed by

Rosaceae (30 species), Ranunculaceae (25 species), Polygonaceae (24 species), Scrophulariaceae (17 species) and Apiaceae (17 species), whereas Orchidaceae (29 species), Poaceae (19 species) and Liliaceae (13 species) were the major families among the monocotyledons. Some uncommon species viz., *Balanophora involucrata, Cypripedium* spp.*, Calanthe manii* and *Eleutherococcus cissifolius* were recorded for the first time from the area. The species categorised under various threat categories (rare, endangered and threatened) e.g., *Cyananthus integer, Dactylorhiza hatagirea, Balanophora involucrata, Fritillaria roylei, Jurinea macrocephala* were also recorded during the survey.

767. **Rai, I.D., Adhikari, B.S. & Rawat, G.S. 2012b.** "Mass foliar damage at subalpine-Timberline Ecotone in Western Himalaya due to extreme climatic events". *American J. Climate Change* 1: 104–107.

Abstract: Glimpses of unusual climatic conditions such as high summer temperature, heavy rainfall as well as snowfall and low winter temperature were noticed during 2010-2011 in subalpine-timberline (2700 - 3600 m) zones of Western Himalaya. Abundant winter injury to the current year (2010) foliage and shoot of *Rhododendron arboreum* and *Quercus semecar-pifolia* became apparent in winters of 2010-2011. The foliar and bud mortality both increased with elevation beyond 2800 m and maximum along the edges of forest. *Rhododendron campanulatum* was another species which also got affected throughout the Western Himalaya. Such events were not reported earlier from the region and current observa-tions indicate the high sensitivity of the plant species to the extreme inter-annual climatic variations.

768. **Rai, I.D., Singh, G. & Rawat, G.S. 2017.** *Plants of Kedarnath Wildlife Sanctuary, Western Himalaya: A Field Guide*. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: This book is the first to cover the Kedarnath Wildlife Sanctuary, a national sanctuary in Uttarakhand, India, which harbours a diverse array of flora and fauna typical of the western Himalayas. Owing to a wide altitudinal range of about 1100 to 7068 m above sea level, this area has a varied topography and range of bio-edaphic conditions, and one finds a large number of vegetation types, and a rich array of mammals, butterflies, birds and reptiles. *Plants of Kedarnath Wildlife Sanctuary, Western Himalaya* not only covers in detail 575 plant species with photographs for easy identification using key characters, but also gives a complete overview of the area of the Kedarnath Wildlife Sanctuary, including its biodiversity, knowledge of local people, general vegetation types, history, and management.

769. **Rai, I.D., Adhikari, B.S., Rawat, G.S. & Bargali, K. 2012.** "Community structure along timberline ecotone in relation to micro-topography and disturbances in Western Himalaya". *Notulae Scientia Biologicae* 4(2): 41–52.

Abstract: Four communities, formed as a result of locally varying site conditions, were identified and studied along the timberline ecotone in part of Kedarnath Wildlife Sanctuary (KWS). Communities on the vicinity of pilgrimage site and along gentler slopes were highly disturbed having sharp timberlines, while those located far and in the steep slopes were less affected, forming a little broader transition. The tree density ranged from 340 to 780 trees/ha, while the basal cover of communities varied greatly and ranged from 6.4 to 55.1 m^2/ha. Birch dominated community had lowest basal area among all the communities, while mixed community had the highest. In all the respective communities, from subalpine zone, density and basal area was higher than that of timberline zone. The Importance Value Index (IVI), which used to determine the overall importance of each species in the community structure, of dominant species at timberline was more than 200 in all the communities, except in the mixed community. Influence of the anthropogenic disturbances was apparent on the regeneration performance of all the studied tree species. *Rhododendron campanulatum* was the dominant shrub species of the area and formed krummholz, while distribution of other species varies greatly with forest type. The shrub density decreased from high to low disturbance, while the herbaceous species density increased with prevalence of a few species favoring the high disturbance (grazing). The shrub and herb species richness was higher in the ecotone zone. Some uncommon species like *Balanophora involucrata* and *Aralia cissifolia* were also found at timberline. Three species of Lady's Slipper orchid were reported together from *Betula utilis* community at timberline ecotone.

770. **Rai, S.K., Shukla, R.P. & Pandey, S.K. 2017.** "Effect of disturbance on the composition and diversity of Sal forests of north-eastern Uttar Pradesh". *Int. J. Bot. Stud.* 2(6): 84–92.

Abstract: The effect of disturbance was observed on the composition and species diversity of understory of the plantation forests of sal taking the least disturbed (LD), moderately disturbed (MD) and highly disturbed (HD) stands at three different sites within north-eastern Uttar Pradesh. The intensity of fuel-wood collection, the grazing and browsing by domestic animals was used to measure the disturbance levels. A total of 92 species belonging to 45 families were reported in moderately disturbed forest stands. 74 species belonging to 37 families in least disturbed forest stand and 68 species belonging to 35 families were recorded in highly disturbed forest stand. Papilionaceae was the most abundant family in both least and moderately disturbed stand whereas Poaceae at highly disturbed forest stand. The density of herbs and shrubs was also quite high within highly disturbed forest stand and vary significantly with moderately disturbed forest stand. In both sites annual and perennial herbs are dominated and distributed contagiously. The shrub layers were dominated by seedling and saplings of *Shorea robusta* and ramets of *Clerodendron infortunatum*. The common understory species, which are locally used as medicine, includes *Curculigo orchioides, Elephantopus scaber* and *Holarrhaena antidysenterica*. The value of diversity and evenness were relatively greater for moderately disturbed forest (H= 4.12, J = 0.90) as compared to highly disturbed (H= 3.19, J = 0.75) and least disturb (H =3.57, J= 0.82) forest stands.

771. **Raizada, A. & Samra, J.S. 2000.** "Rehabilitation of an abandoned limestone mine in the lower western Himalayas– Impact assessment on vegetation development and floristic diversity". *Indian Forester* 126(8): 842–855.

Abstract: Rehabilitation of mine spoiled areas through suitable bioengineering measures and allowing natural succession of vegetation to progress in an essential step towards ecosystem recovery. In this paper, the effect of such measures

accompanied with protection of an abondaned limestone mine have been described. Development of vegetation and its phytosociological characteristics were compared with an adjoining but slightly disturbed natural forest situated in the lower sub-humid Himalayan region. In the rehabilitated area, an introduce species *Leucaena leucocephala* had the highest Importance Value Index (IVI) of 66.05, followed by a sedge species *Eriophorum cosmosum* (IVI 58.85) and *Acacia catechu* (IVI 51.85). The area also supported a significant growth of *Thysaloena maxima* and *Saccharum spontaneum*. In the adjoining non-mined forest, the highest IVI value was recorded for *Corchorus laurifolius* (55.98), followed by *Mallotus philippensis* (47.55), *Murraya koenigii* (38.71) and *Bauhinia retusa* (37.02).

772. **Raizada, M.B. 1931.** "Contribution to Duthie's Flora of the Upper Gangetic Plain from the neighbourhood of Dehra Dun". *J. Indian Bot. Soc.* 10: 155–158.

773. **Raizada, M.B. 1954.** "Grasses of the Upper Gangetic Plain and some aspects of their ecology". *Indian Forester* 80(1): 24–46.

Abstract: This work deals with the grasses of 'The Upper Gangetic Plain', covering an area of approximately 1,96,000 sq. miles, namely the states of Uttar Pradesh, Delhi, Ajmer-Merwara, East Rajasthan, Vindhya Pradesh and Madhya Bharat (places above 2300 ft. have been excluded). After discussing some aspects of ecology and the evolution of the grasses, forest and grassland climates, indicator value of grasses, grazing problems and improvement of fodder supplies, two hundred and fifty species belonging to about one hundred genera found in the area have been enumerated. Three new names, viz., *Erianthus procerum* (Roxb.) Raizada, *Themeda longispatha* (Hack.) Raizada et Jain and *Cymbopogon stracheyi* (Hook.f.) Raizada et Jain have been proposed.

774. **Raizada, M.B. 1959.** "Mussoorie and its plants". *Indian Forester* 85(11): 668–690.

Abstract: Nearly 1200 species of phanerogams and 136 ferns have been reported from Mussoorie of an area about 120 sq. miles and between 3000-7500 ft.

775. **Raizada, M.B. 1976.** *Supplement to Duthie s Flora of Upper Gangetic Plain and of the adjacent Siwalik and sub Himalayan tracts*. Bishen Singh Mahendra Pal Singh, Dehra Dun.

776. **Raizada, M.B. & Jain, S.K. 1964.** "Grasses of the Upper Gangetic Plain - Part II". *Indian Forest Rec. (Bot.)* 5(3): 151–226.

777. **Raizada, M.B. & Jain, S.K. 1966.** "Grasses of the Upper Gangetic Plain– Pooideae". *Indian Forester* 92(10): 637–642.

Abstract: The following paper is a precausor of the author's third and final report of the work 'Grasses of the Upper Gangetic Plain'. A list of the species of the family Pooideae proposed to be included in that work is given which includes 133 taxa.

778. **Raizada, M.B. & Sahni, K.C. 1957.** "Vegetation types in Kumaon Himalaya with special reference to the Panch Chuli Area". *J. Indian Bot. Soc.* 36: 599–600.

779. **Raizada, M.B. & Saxena, H.O. 1978.** *Flora of Mussoorie,* Vol. 1. Bishen Singh Mahendra Pal Singh, Dehradun.

780. **Raizada, M.B., Bharadwaja, R.C. & Jain, S.K. 1957.** "Grasses of the Upper Gangetic plain, part I- Panicoideae". *Indian Forest Rec.* (Bot.) 4: 171–277.

781. **Raizada, M.B., Naithani, H.B. & Saxena, H.O. 1981.** *Orchids of Mussoorie*. Bishen Singh Mahendra Pal Singh, Dehradun.

782. **Rajagopal, T. & Panigrahi, G. 1965.** "'Aliens' naturalized in the flora of Allahabad". *Proc. Natl. Acad. Sci. India,* Sec. B. 35: 411–422.

783. **Rajbhandari, K.R. & Edmondson, J.R. 1990.** "*Poa royleana* (Gramineae), a little known species from Western Himalaya". *Kew Bull.* 45(2): 345–349.

Abstract: *Poa royleana* Nees ex Steudel, treated as a synonym of *Poa annua* by earlier authors, was found to be different from *P. annua* after examination of the type specimen and is compared with the other species of Himalayan *Poa* having similar spikelet characters.

784. **Rajkumar & Kumari, B. 2017.** "Diversity of grass flora of Moradabad district with special reference to their utility". *Int. J. Bot. Stud.* 2(6): 166–169.

Abstract: Within the wide diversity of flowering plants 'Grasses' are the one which can be found anywhere with great abundance. Grasses are the members of Poaceae (Gramineae) family which are the most vital part in our life as food, medicine, cattle-fodder and many different things. The rural people of Moradabad district use different parts of grasses in crude form as cure for many diseases. This paper deals with 62 grasses belonging to seven subfamilies and thirteen tribes. Sub- family Panicoideae exhibits maximum representation with 34 species followed by Chloridoideae with 14 species. *Bambusa arundinacea* Willd., *Dendrocalamus strictus* (Roxb.) Nees., *Leersia hexandra* Sw., *Thysanolaena maxima* (Roxb.) O. Kuntze are rare grasses of the study area.

785. **Rajvanshi, A., Soni, S., Kukreti, U.D. & Srivastava, M.M. 1983.** "A comparative study of undergrowth of Sal forest and *Eucalyptus* plantation at Golatappar, Dehradun during rainy season". *Indian J. Forest.* 6(2): 117–119.

Abstract: Our present knowledge of the undergrowth vegetation of Sal forest and *Eucalyptus* plantation is still meagre. During the course of the studies on undergrowth vegetation of Sal forest and *Eucalyptus* plantation at Golatappar, Dehra Dun. 37 species have been recorded from Sal forest. *Flemingia chappar* and *Clerodendron infortunatum* dominate the site. The seedling of a number of tree species also contributed fairly well to the undergrowth vegetation. The undergrowth vegetation of *Eucalyptus* plantation was fairly rich. 65 plant species were found to be present. *Ageratum conyzoides* was the dominant species. The difference in the composition of species may be attributed to the open and closed canopy of these forests.

786. **Rajwar, G.S. 1980.** *Floristic and Vegetational Explorations of Siwalik and adjacent Bhabar tract between Khoh and Ganges (Garhwal)*. Ph. D. Thesis, H.N.B. Garhwal University, Srinagar (unpublished).

787. **Rajwar, G.S. 1986.** "Additions to the flora of Mussoorie hills". *J. Econ. Taxon. Bot.* 8(2): 488.

Abstract: *Phaseolus sublobatus* Roxb. (Papilionaceae), *Ficus pomifera* Wallich (Moraceae), *Phoenix humilis* Royle (Arecaceae), *Colocasia fallax* Schott. (Araceae) and *Arthraxon nudus* (Steud.) Hochst. (Poaceae) have been collected from Rispana valley near Jharipani in the south east of Mussoorie.

788. **Rajwar, G.S. & Gupta, S.K. 1981.** "Flora and biological spectrum of Khoh valley, district Pauri (Garhwal)". *Indian J. Forest.* 4(1): 49–55.

Abstract: Flora and biological spectrum of Khoh valley (Pauri Garhwal) have been studied in relation to the environment and soil conditions. Life forms in the order of importance recorded were therophytes (68.4%), phanerophytes (18.4%), chamaephytes (8.0%), geophytes (4.6%) and hemicryptophytes (0.6%). The study area seems to be predominating by phanerophytes except the river banks and other disturbed areas where therophytes are dominating. The exploration yielded 238 species of angiosperms (170 dicotyledons and 68 monocotyledons).

789. **Rajwar, G.S. & Gupta, S.K. 1984.** "Biological spectrum of Garhwal Siwalik". *Indian Forester* 110(12): 1171–1176.

Abstract: The biological spectrum of Garhwal Siwalik has been studied in relation to the environment. Life forms in order of importance recorded were therophytes (62.8%), phanerophytes ((26.8%), chamaephytes (5.7%), geophytes (4.5%) and hemicryptophytes (0.2%). The vegetation appears to be predominating by phanerophytes except the river banks and other disturbed areas where therophytes are dominating.

790. **Rajwar, G.S. & Gupta, S.K. 1988.** "Flora of Garhwal Siwaliks between Khoh and Ganga". *Indian J. Forest.* 11: 69–73; 11: 225–228.

791. **Rajwar, G.S. & Gupta, S.K. 1989.** "Flora of Garhwal Siwaliks between Khoh and Ganga". *Indian J. Forest.* 12(1): 43–53.

792. **Rajwar, G.S. & Gupta, S.K. 1992.** "Structure of forest vegetation of Garhwal Siwalik hills between the river Khoh and Ganges". *Indian Forester* 118(2): 148–165.

Abstract: The vegetation of Garhwal Siwalik hills between the rivers Khoh and Ganges has been studied for various phytosociological parameters. The forests on sites 1 to 5 consisted of *Holoptelea-Terminalia, Adina-Schleichera, Shorea-Mallotus, Bischofia-Holoptelea* and *Acacia-Dalbergia* community respectively. The total tree density and the basal cover of the forests have been compared with those of certain tropical and temperate forests of the world. These forests are the extension of Himalayan temperate forests.

793. **Ralhan, P.K., Saxena, A.K. & Singh, J.J. 1982.** "Analysis of forest vegetation at and around Nainital in Kumaon Himalaya". *Proc. Indian Natl. Acad.* Sci. B, 48: 121–138.

Abstract: Certain forests at and around Nainital were quantitatively analysed. On the basis of IVI, a total of five forest types, viz., *Pinus roxburghii, Quercus floribunda, Q. Lanuginosa, Q. leucotrichophora* and *Q. semecarpifolia* were recognised. The total tree basal cover ranged from 2686.7 to 6045.8 $cm^2/100\ m^2$. The composition of tree and shrub layers differed markedly among various types of forest.

794. **Ralhan, P.K., Khanna, R.K., Singh, S.P. & Singh, J.S. 1985.** "Phenological characteristics of the tree layer of Kumaun Himalayan forests". *Vegetatio* 60: 91–101.

Abstract: The phenology of tree components of natural forests occurring between 350 and 2150 m in Kumaun Himalaya is descibed. All forests had more evergreen than deciduous taxa. The degree of evergreenness increased with increasing elevation and decreasing summer dryness. For most species (including all dominants) concentrated leafdrop and simultaneous leafing occurred during the warm-dry period of the year. About half of the species showed multiple leafing. All species had a sharp flowering peak in April. Wet-season flowering was rare. Most of the species flowered synchronously. In the sal (*Shorea robusta*) and pine (*Pinus roxburghii*) forests a single peak of fruit maturation occurred in summer, while in other forests there also was a secondary peak in autumn.

795. **Ram, J. & Arya, P. 1991.** "Plant forms and vegetation analysis of an alpine meadow of Central Himalaya, India". *Proc. Indian Natl. Acad.* Sci. 57(5): 311–318.

796. **Ram, J. & Singh, S.P. 1994.** Ecology and Conservation of Alpine Meadows in Central Himalaya, India. In: Pangtey, Y.P.S. & Rawal, R.S. (Eds) *The High Altitudes of the Himalaya.* Gyanodaya Prakashan, Nainital. Pp. 33–55.

797. **Ram, J., Kumar, A. & Bhatt, J. 2004.** "Plant diversity in six forest types of Uttaranchal, Central Himalaya, India". *Curr.* Sci. 86(7): 975–978.

Abstract: *Quercus* spp. (Oaks) and *Pinus roxburghii* Sarg. (Chirpine) are the major forest-forming tree species in the Central Himalayan region. *P. roxburghii* forest is generally pure with low total species richness of shrubs and herbs, while mixed-broadleaved forest has high total species richness. Shrubs and herbs show high species richness in *P. roxburghii* mixed-broadleaved forest and low species richness in *Quercus semecarpifolia* Sm. forest. *Quercus leucotrichophora* A. Camus forest has high tree diversity, while shrub and herb diversity is highest in *Cupressus-Quercus* mixed forest. Anthropogenic disturbances are changing the species richness and diversity, which influence the soil and environmental conditions. Thus, the conservation and management of these forests will be important for the sustainability of human and land in the region.

798. **Ram, J., Singh, S.P. & Singh, J.S. 1988.** "Community level phenology of grassland above tree-line in central Himalaya, India". *Arct. & Alp. Res.* 20(3): 325–332.

Abstract: The developmental stages of 142 alpine plant species were observed during 1984/85 in the grassland site of Rudranath bughiyal (30°28' N, 79°20 E; 3250 to 4200 m) in the Central Himalayan region. The growth initiation synchronized with the beginning of the spring temperature rise and the resultant snowmelt, and peaked after 30 to 40 d. In this alpine grassland, the peaks of the various phenophases succeeded one after another over about 4 mo, from early June to early October. This study supports the notion that in the unfavorable environment of the high elevations the primary plant strategy is to complete the growth cycle rapidly in order to assure the survival of the species

799. **Ram, J., Tewari, B. & Arya, N. 2010.** "Ecology of medicinal plants in Uttarakhand Himalaya, India". *Indian Forester* 136(9): 1223–1229.

Abstract: Medicinal plants are one of the important components of the forests of Himalaya and grow in different communities and group of species. The herb communities were studied mainly in oak and oak mixed forests of Uttarakhand

Himalaya. Herb cover was higher in oak-pine forest while it was lower in oak dominated mixed forest. The most frequent medicinal herb was *Artemisia nilagirica* Linn. while large number of medicinal herbs was rarely distributed in these forests. It was concluded that the natural distribution and their associations would be important for growing and conserving the medicinal herbs in the Uttarakhand Himalaya.

800. **Rana, B.S., Verma, K.R. & Pandey, A.N. 1985.** "Analysis of forest vegetation at Siahi Devi hill Almora division in Kumaun Himalayas". *Indian Forester* 111(9): 745–759.

Abstract: Forests on northern and southern aspects in Siahi Devi hill of West Almora Division in Kumaun Himalayas were quantitatively analysed. Three forest types, viz., *Pinus roxburghii* at hill base (1250-1500 m), mixed oak-pine at higher altitude (1750 m) and *Quercus leucotrichophora* at hill top (2000-2200 m) were recognised on northern aspects. Forest of southern aspects were categorised only into two types, viz. *P. roxburghii* upto 2000 m and mixed oak-pine at hill top (2200 m). The composition of tree layer among the forests differed markedly on northern aspect whereas it was considerably similar on southern aspects.

801. **Rana, C.S., Rana, V. & Bisht, M.P.S. 2010.** "An unusual composition of plant species towards zone of ablation (Tipra glacier), Garhwal Himalaya". *Curr. Sci.* 99(5): 574–576.

802. **Rana, S. & Rastogi, J. 2017.** "Occurrence and floral details of four new invasive alien species in Uttarakhand, India". *Archives Agric. & Environm. Sci.* 2(2): 113–118.

Abstract: The present paper deals with the communication of four new species which are addition to the old reported species out of these 91 species which were studied. Four new invasive alien species (IAS) are *Acmella radicans* (Jacq. R.K. Jansen), *Eclipta prostrata* (L.) L., *Euphorbia cyathophora* Murray and *Senna alata* (L.) Roxb. was recorded as new elements in IAS flora of Uttarakhand. The study is conducted during 2011-2015 to compile a comprehensive list of Invasive alien species. A total of 91 Invasive Alien Species were collected from the different areas of Pantnagar. These 91 IAS belonged to 70 genera under 30 families. Dicotyledons were representing by 82 species belonging to 63 genera under 25 families, whereas monocotyledons were represented by 9 species belonging to 7 genera under 5 families. The taxonomic analysis of IAS revealed dominance of Asteraceae with 16 species in 14 genera followed by Amaranthaceae with 10 species in 7 genera, Fabaceae with 8 species in 6 genera, Malvaceae with 7 species in 6 genera, Convovlvulaceae with 7 species in 3 genera, Solanaceae with 6 species in 4 genera, Poaceae with 4 species in 3 genera and Euphorbiaceae with 4 species in 2 genera. Results of this study clearly indicate presence of 52.60% of IAS flora of India and 55.82% of IAS flora Uttarakhand in such a small area of Pantnagar. Eradication of these species is impractical and costly; however, their population needs regular monitoring and any new introduction need eradication as early as possible.

803. **Rana, T.S., Datt, B. & Rao, R.R. 2002.** "Life forms and biological spectrum of the flora of Tons valley, Garhwal Himalaya (Uttaranchal), India". *Taiwania* 47(2): 164–169.

Abstract: The present paper deals with the different life form categories and biological spectrum of the flora of Tons Valley in Garhwal Himalaya. It includes Phanerophytes (29.06%), Nano-phanerophytes (6.47%), Chamaephytes (22.19%), Hemicryptophytes (2.11%), Geophytes (2.64%), Hydrophytes and Helophytes (8.58%), Therophytes (17.83%), Lianas (10.43%), and Epiphytes (O.66%). The comparison with Raunkiaer's normal spectrum depicts 'Hydro- Chamaephytic Phytoclimate.

804. **Rana, T.S., Datt, B. & Rao, R.R. 2003.** *Flora of Tons Valley, Garhwal Himalaya (Uttaranchal)*. Bishen Singh Mahendra Pal Singh, Dehradun.

805. **Rana, T.S., Husain, T. & Rao, R.R. 1995.** "A critical appraisal of the type locality of a rare palm from Kumaon Himalaya, India". *Curr. Sci.* 68(6): 590–592.

806. **Ranjan, V. 1997.** "Wall flora of Lalitpur, U.P.". *J. Econ. Taxon. Bot.* 21(2): 421–425.

Abstract: In the present communication, 79 species belonging to 66 genera of 33 families have been recorded from the various walls of Lalitpur, Uttar Pradesh. 72 species were recorded in the rainy season, 59 species in winter and 33 species in summer.

807. **Ranjan, V. 2005.** "Asteraceae in Lalitpur district, U.P." *J. Econ. Taxon. Bot.* 29(2): 266–273.

Abstract: The paper enumerates 33 species under 27 genera of the family asteraceae found in the Lalitpur district of Uttar Pradesh.

808. **Ranjan, V. & Verma, B.K. 1995.** "Biological spectrum of Lalitpur flora". *Geobios, New Rep.* 14: 81–82.

Abstract: The statistical distribution of life-forms in the flora of a region is expressed in the form of a biological spectrum. All the 535 plant species of this district are grouped into life-form categories. It study shows that therophytes (200, 37.38%), phanerophytes (93, 17.38%), nanophanerophytes (30, 5.6%), chamaephytes (53, 9.9%), hydro-halophytes (28, 5.23%), lianas (35, 6.5%), hemicryptophytes (69, 12.89%), geophytes (25, 4.67%) and parasites (2, 2.37%) are as shown in parenthesis. It is evident that the therophytes constitute the highest percentage, which is almost three times more than the normal spectrum.

809. **Ranjan, V. & Varma, B.K. 1996.** "Aquatic, marshy and wetland plants of Lalitpur district". *Geobios, New Rep.* 15: 44–48.

Abstract: This paper enumerates the aquatic, marshy and wetland flowering plants of district lalitpur (U.P.). Ecological classification along with flowering periods of 80 species belonging to 57 genera are recorded.

810. **Rao, K.S., Nautiyal, S., Maikhuri, R.K. & Saxena, K.G. 2000**. "Reserve Management vs. people in Nanda Devi Biosphere Reserve (NDBR), India: An analysis of conflicts". *Mount. Res. & Develop.* 20: 320–323.

811. **Rao, K.S., Nautiyal, S., Maikhuri, R.K. & Saxena, K.G. 2003.** "Local peoples' knowledge, aptitude and perceptions of planning and management issues in Nanda Devi Biosphere Reserve, India". *Environm. Manage.* 31(2): 168–181.

Abstract: Local peoples' knowledge, aptitude, and perceptions of planning and management issues were investigated in Nanda Devi Biosphere Reserve (NDBR) in Uttaranchal State of India. Conflicts ensued between local inhabitants and the management authority due to lack of community participation. Although most respondents seem to claim the knowledge of the objectives of Nanda Devi Biosphere Reserve, the source of information indicates their interaction with the management authority is not frequent. While local population seem to agree on reduced intensity of agriculture with compensation equal to loss of net income, there is a perceptible difference in responses among different age groups. While the younger generation seems to agree to move away to other areas with suitable compensation packages, the older generation prefer those options that require some adjustments in use and access to natural resources. The option of ecotourism as a source of income is acceptable to most respondents, but young and old respondents disagreed about impact of such activity on social behavior of local inhabitants. Among those groups studied, only the "self-employed group" seem to be more interested in ecotourism in comparison to other occupation classes. Gender differences in perceptions are prominent with reference to development options. While the men preferred economic opportunities, the women preferred improved living conditions. An evaluation mechanism similar to the one described in this paper will be helpful to the management authority to assess and modify their management plans to mitigate conflicts with local people.

812. **Rao, M.V. & Verma, S.C. 1983.** "Correlation analysis of synecological parameters of Lucknow grassland". *Indian J. Forest.* 6(1): 62–65.

Abstract: The present paper deals with the relationship between structural and functional attributes of five grassland sites. The IVI indicates, *Dichanthium caricosum* as dominating grass in Site 1 and 2; and *Cynodon dactylon* on Site 3 and 4, however, the *Sporobolus coromandelianus* was found to be dominant in Site 5 during study period. The abundance has been found positively correlated with aboveground standing and dead biomass, and total plant community biomass. Positive relationship exists between basal area and aboveground live biomass.

813. **Rao, R.R. & Datt, B. 1993.** Distribution and diversity of the family Berberidaceae in the Himalaya. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies.* G.B. Pant Institute of Himalayan Environment & Development, Almora. Pp. 267–278.

814. **Rao, R.R. & Garg, A. 1994.** "Can *Eremostachys superba* be saved from Extinction?". *Curr. Sci.* 67: 80–81.

815. **Rao, R.R. & Hussain, T. 1993.** Himalayan Legumes: Diversity and Conservation. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies.* G.B. Pant Institute of Himalayan Environment & Development, Almora. Pp. 253–266.

816. **Rao, T.A. 1959.** "Report on a botanical tour to Milam glacier". *Bull. Bot. Surv. India* 1: 97–120.

Abstract: Total five hundred forty species collected from Milam Glacier of which 513 are angiosperm, 7 gymnosperm and 20 pteridophytes. A few species of algae fungi and bryophytes were also collected. The interesting collection include species of certain endemic genera like *Vicatia, Pentapanax, Hemipgrahma* and *Picrorhiza*, three new records, viz., *Callitriche verna, Corallorhiza trifida* and *Leptodermis parkeri* and three little known plant, viz., *Polygonum sagittatum* L., *Mazus dentatus* Wall. and *Falconeria himalaica* Hook.f. have also collected from this area.

817. **Rao, T.A. 1960.** "Botanical tour to Pindari glaciers and Kumaon hills". *Bull. Bot. Surv. India* 2(1&2): 61–94.

Abstract: The paper describes in brief some of the observations made during recent plant collection tour to the famous Pindari Glacier and some of the Kumaon Hill stations. A systematic census of 720 species of which 676 are angiosperms, 4 are gymnosperms and 40 are pteridophytes is included in the paper. Amog other plants of interest collected were *Balanophora involucrata* Hook.f., *Triplostegia glandulifera* Wall., *Senecio chlorostachys* Duthie, *Streptopus simplex* D. Don, *Parnassia kumaonica* W. Nekrassowa, and nine species of angiosperm viz., *Elatostema cuneatum* Wight, *E. rupestre* Wedd., *E. ficoides* Wedd., *Disporum pullum* Salisb. var. *parviflora* Bak., *Roscoea longifolia* Baker, *Senecio levingii* Clarke, *Fritillaria cirrhosa* D. Don and *Gentiana recurvata* Clarke which are previously unrecorded in the published literature on the flora of the area.

818. **Rao, T.A. 1964.** "Observations on the vegetation of Eastern Kumaon bordering the Nepal frontier". *Bull. Bot. Surv. India* 6(1): *47–57.*

Abstract: The paper describes some of the observations made during a botanical exploration tour of Eastern Kumaon bordering the Nepal Frontier and includes a list of plants collected with brief botanical notes. Among the plants collected are specimens of *Triosteum hirsutum* Wall., a rare member of Caprifoliaceae, *Stylophorum lactucoides* Benth. & Hook.f. of the Papaveraceae rarely collected in the past, *Osmunda regalis* L. and *Thesium himalense* Royle.

819. **Rastogi, J., Rawat, D.S. & Chandra, S. 2015.** "Diversity of invasive alien species in Pantnagar flora". *Trop. Pl. Res.* 2(3): 282–287.

Abstract: Biological diversity faces many threats throughout the world and one of the major threats is caused by invasion of alien species. The present study proves presence of 94 invasive alien species in flora of Pantnagar, Uttarakhand, India. These 94 invasive alien species (IAS) belong to 72 genera, under 33 families 85 species are dicotyledons while 9 species are monocotyledons. On the basis of their nativity maximum IAS have their sourced region as American continents (74), followed by Africa (8), Europe (5), Mediterranean (3) and Asia & Australia (2). The taxonomic analysis of IAS reveals dominance of Asteraceae with 18 spp. followed by Fabaceae, Amaranthaceae, Convolvulaceae, Malvaceae, Solanaceae, Poaceae etc. Among these, 78 IAS are herbs followed by shrubs (8), grasses (4), sedges (2), trees (1), and climber (1). Such a large number of invasive alien species in small area of Pantnagar, indicate miserable condition of natural vegetation.

820. **Rau, M.A. 1961.** "Flowering plants and ferns of North Garhwal, Uttar Pradesh, India". *Bull. Bot. Surv. India* 3(3&4): 215–251.

Abstract: The paper gives an account of the recent collection of flowering plants and ferns from the Garhwal Himalayas, made by the author during the years 1957 to 1959 in which nearly 1500 gathering were made which on study yielded 738 species. The area covered by this study lies between 30Úand 31Ú N and 79Ú and 80ÚE, and includes the Alkananda, Arwa, Bhyundar, Khiraun, Mandakini and Nandakini river valleys and their neighbouring glacial beds, mountain slopes and meadows ranging

in altitude between 2000 and 4500 m. *Cypripedium elegans* Reichb.f., a rare terrestrial orchid was collected for the first time in Western Himalayas.

821. **Rau, M.A. 1963a.** *Illustrations of West Himalayan Flowering Plants*. Calcutta.

822. **Rau, M.A. 1963b.** "The vegetation around Jumnotri in Tehri Garhwal, U.P.". *Bull. Bot. Surv. India* 5(3&4): 277–280.

Abstract: The distribution of vegetation in the altitude range, 1500 to 3500 metres and the composition of the main *Rhododendron campanulatum –Betula utilis* and *Abies spectabilis–Betula utilis–Quercus semecarpifolia* forests as observed by the author duing a recent plant collection tour in the Jumnotri areaof Tehri-Garhwal Himalayas are described in this paper. The herbaceous vegetation in the forests is very rich and many monocotyledonous species are represented. The paper includes an enumeration of the plants collected during the tour in two series, one consisting of those collected in the altitude range, 1500-2500 m and the other at 2500-3500 m.

823. **Rau, M.A. 1964.** "A visit to the Valley of Flowers and lake Hemkund in North Garhwal, U.P.". *Bull. Bot. Surv. India* 6(2-4): 169–171.

Abstract: The paper gives a brief account of the vegetation in the valley and around Lake Hemkund in late autumn as observed by the author during a recent visit. The paper also records, for the first time, the occurrence of *Epipogium tuberosum* Duthie, the rare saprophytic orchid which was previously known only from Kashmir and was recently recorded from Kulu Himalayas, thus extending its known distribution further eastwards. A photograph of the singular woolly species of *Saussurea* gathered at an altitude of 4400 m is included.

824. **Rau, M.A. 1968.** "Flora of the Upper Gangetic Plain and the adjacent Siwalik and sub-Himalayan tracts– Check list". *Bull. Bot. Surv. India* 10 (Supplement 2): 1–87.

825. **Rau, M.A. 1975.** *High Altitude Flowering Plants of Western Himalaya*. Botanical Survey of India, Howrah-3.

826. **Raut, N., Tiwari, U.K., Adhikari, B.S., Rawat, G.S. & Chandola, S. 2013.** "Population status of commercially important medicinal plants in Dehradun Forest Division, Uttarakhand (India)". *Notulae Scientia Biologicae* 5(2): 175–182.

Abstract: The objective of forest management in the tropics, in recent decades, has shifted from timber production to biodiversity conservation and maintenance of life support system. However, past forestry practices have greatly influenced the structure of plant communities, preponderance of foreign invasive species, populations of high value medicinal plants as well as other non-wood forest products. We assessed the abundance and distribution of medicinal plants in managed and undisturbed forests of Dehradun Forest Division (DFD), Uttarakhand (India). A total of 80 transects (each 1 km long) were laid in various categories of forest types in DFD. This paper deals with distribution, availability and regeneration status of five commercially important species viz., *Justicia adhatoda, Aegle marmelos, Phyllanthus emblica, Terminalia bellirica* and *Terminalia chebula*, across different forest types. The study reveals that open canopy forest patches, *Lantana* infested patches and *Acacia catechu-Dalbergia sissoo* (Khair-Shisam) woodlands in the eastern part of the DFD have excellent potential for the production and sustainable harvest of *Justicia adhatoda*. Areas those are less

suitable for timber production viz., open hill forests, have greater potential for conservation and development of *Aegle marmelos, Phyllanthus emblica* and *Terminalia bellirica*. For the production and management of high value medicinal plants in the DFD these ecological considerations need to be kept in mind.

827. **Rawal, R.S. 1991.** *Woody vegetation analysis along an elevational gradient (1600-3400 m) of Upper Saryu Catchment, Kumaun Himalaya.* Ph. D. Thesis, Kumaun University, Nainital (unpublished).

828. **Rawal, R.S. & Dhar, U. 1997.** "Sensitivity of timberline flora in Kumaun Himalaya, India: Conservation Implications". *Arct. & Alp. Res.* 29: 112–121.

Abstract: The paper focuses on the diversity in the timberline flora in a part of Kumaun (west Himalaya). Of the 465 species recorded, >64% were native Himalayan taxa. Scrophulariaceae (78%), Ranunculaceae (70%), Asteraceae (69%), Rosaceae (68%), and Saxifragaceae (63%) were the dominant families showing high percentage of native taxa. Although flora mainly contained perennial growth forms (86%), the representation of annuals (14%) was more compared to the subalpine/ alpine regions of the other mountain systems in the world. All the Himalayan endemic and near endemic taxa (55% of native taxa) in the timberline flora were analyzed for their susceptibility to endangerment. The analysis provided a rapid approach to rank the potentially endangered taxa for conservation action at both local (timberline zone of Kumaun) and regional (Himalaya) spatial scales. Analysis revealed that 34 taxa need top priority at local level while 13 deserve priority attention at Himalayan scale. Three taxa (*Cypripedium himalaicum, Aconitum balfourii,* and *Caragana gerardiana*) were, however, identified to be common to both local and Himalayan scale. The frequency of different priority classes in identified habitat types was also analyzed to identify the habitats deserving attention for conservation initiatives.

829. **Rawal, R.S. & Dhar, U. 2001.** "Protected Area Network in Indian Himalayan region: Need for recognizing values of low profile protected areas". *Curr. Sci.* 81(2): 175–184.

Abstract: In the aftermath of Convention on Biological Diversity and Caracas Congress on Parks (1992), mainte- nance and extension of the network of protected areas (PAs) has received impetus across the globe. India has also responded positively in this context. The network of legally designated PAs and other conservation sites (CSs) in India comprise 614 units covering over 7.3% of the total geographical area. The Indian Himalayan region (IHR), on account of richness and uniqueness of biodiversity elements, is represented fairly well (15 national parks and 59 sanctuaries covering 9.6% of the geographical area) within the PA network of India. The paper reviews the existing state of PAs in the IHR and identifies various gaps therein. It highlights the existing di s- parity in ra nking the importance of PAs, wherein values of a few of them are often over-emphasized while, several others with a relatively higher stake of biodiversity remain unnoticed. This trend adversely affects the maintenance of biodiversity elements which deserve immediate attention. The potentials of such low profile PAs in IHR are discussed through a detailed review of biophysical values of hitherto lesser known PA - Askot Wildlife Sanctuary - in Kumaun,

West Himalaya. The paper calls for an introspection by all concerned and recommends that efforts are urgently needed for a thorough evaluation of existing PAs in the IHR to redefine priorities on the basis of their biodiversity attributes.

830. **Rawal, R.S. & Pangtey, Y.P.S. 1991.** "Distribution and phenology of climbers of Kumaun in Central Himalaya, India". *Vegetatio* 97: 77–87.

Abstract: A total of 105 climber species were recorded and studied for their altitudinal distribution and phenology. Relatively higher percentage (54%) of deciduous species was recorded. In general, the climbers were distributed throughout the region between altitudes of 300–3500 m. However, maximum (more than 60%) species were confined either below or at around 1500 m altitude. Species richness declines gradually towards the higher altitudes, the decline was more sharp in evergreen species. The different phenological activities were usually governed by the seasonal variations in a year. Seasonality of flowering suggested the prevalence of insect pollination. Whereas, fruit types indicated equal sharing of biotic and abiotic dispersal. Study concludes, the distribution and nature of various climber species of Kumaun in Indian Central Himalaya, depends largely upon altitude and its climatic variable temperature. Whereas, the seasonality of rains plays an important role in seasonal progression of phenophases.

831. **Rawal, R.S. & Pangtey, Y.P.S. 1993.** Vegetation Diversity at Timberline in Kumaun, Central Himalaya, India. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies*. G.B. Pant Institute of Himalayan Environment and Development, Almora. Pp. 219–229.

832. **Rawal, R.S. & Pangtey, Y.P.S. 1994a.** "Altitudinal zonation of high altitude forests in Kumaun, Central Himalaya, India. *Indian J. Forest.* 17(4): 332–344.

Abstract: Attempts to assign the altitudinal sequences for the existing forest zones and types within an altitudinal range of 1600-3100 m in Sarju catchment of Kumaun (Central Himalaya) are made. Forests in this region formed a sharp boundary around 3100 m. In general, three forest zones, viz., low altitude zone (1600-2000 m), mid altitude zone (2000-2500 m) and high altitude zone (2500-3100 m) could be recognised arbitrarily. The altitudinal sequences of forest vegetation exhibited a sharp compositional change at mid altitude zone (2000-2500 m). This zone is, therefore, considered as an ecotone. A less sharp transition (ecotone) was also apparent between 2700-2850 m, separating the stunted and open canopy growth of sub-alpine forest on upper and huge erected and closed capony growth of *Quercus semecarpifolia* forest towards lower limit. The polar ordination of 51 forest stands by and large indicates a continuity of vegetation. However, more objective examination recognised almost seven existing forest types (*Quercus incana* forest, *Rhododendron arboratum* forest, *Pinus roxburghii* forest, *Quercus lanuginosa* forest, Oak-mixed deciduous forest, *Quercus semecarpifolia* forest and Sub-alpine forest). The altitudinal pattern of distribution and the major compositional features of these high altitude forests have been compared and discussed with the forests of lower altitudes of central Himalaya.

833. **Rawal, R.S. & Pangtey, Y.P.S. 1994b.** "Distribution and structural-functional attributes of trees in the high altitude zone of central Himalaya, India". *Vegetatio* 112: 29–34.

Abstract: Patterns of tree species distribution and their structural-functional features were studied along an altitudinal gradient in the Indian Central Himalaya. The forest vegetation falls within three formation types: low to mid-montane sclerophyllous, broad-leaved forests; mid-montane deciduous forests; and high-montane mixed stunted forests. Deciduous tree species formed a considerable (49%) portion of the high altitude forests between 1500–3300 m. The upper limit of forests ranges from 3000 to 3300 m, and three taxa are commonly found at tree line: an evergreen, needle-leaved gymnosperm (*Abies pindrow* Spach.), an evergreen, broad-leaved sclerophyllous oak (*Quercus semecarpifolia* Sm.), and a deciduous, broad-leaved birch (*Betula utilis* Don). The high altitude forests differed from the low altitude forests of Central Himalaya in their greater proportion of microphanerophytes. Vernal flowering is common at this elevation in Central Himalaya. In general, in their elevational distribution and structural-functional attributes, these high altitude forests are similar to other forests of cool temperate zones in Himalaya.

834. **Rawal, R.S. & Pangtey, Y.P.S. 1994c.** "High Altitude Forests with Special Reference to Timberline in Kumaun, Central Himalaya. In: Pangtey, Y.P.S. & Rawal, R.S. (Eds.), *High Altitudes of the Himalaya*. Gyanodaya Prakashan, Nainital, pp. 353–399.

835. **Rawal, R.S. & Rawat, B. 2012.** Nanda Devi Biosphere Reserve. In: Palni, L.M.S., Rawal, R.S., Rai, R.K. & Reddy, S.V. (Eds.), *Compendium on Indian Biosphere Reserve Progression during Two Decades of Conservation*. Ministry of Environment and Forests, New Delhi. Pp. 44–54.

836. **Rawal, R.S., Bankoti, N.S. & Pangtey, Y.P.S. 1994.** "Broad community identification of high altitude forest vegetation in Pindari catchment of Kumaun". *Proc. Indian Natl. Sci. Acad.* (B) 60: 553–556.

837. **Rawal, R.S., Bankoti, N.S., Samant, S.S. & Pangtey, Y.P.S. 1991.** "Phenology of tree layer species from the timber line around Kumaun in Central Himalaya, India". *Vegetatio* 93: 108–118.

Abstract: Phenology of tree layer species from the timber line of Kumaun in Central Himalaya was carried out during the years 1988-1989. The study indicates the prevalence (66%) of deciduous tree species at timber line vegetation. Growth initiation started in early summer with the rise of temperature. Different phenophases succeeded one another, culminating in leaf drop with the advent of winter. The various phenophases of the tree species at timber line have been discussed and compared with the lower Himalayan forests of Kumaun in India. The present study also supports the idea that the intense fluctuations in environmental conditions determine the onset of different growth activities within the short growing season.

838. **Rawat, A., Sachan, S. & Sachan, S.N. 1994.** "Host range of *Cuscuta reflexa* Roxb. from Doon valley". *Indian J. Forest.* 17(1): 73–77.

Abstract: In systematic survey of the Doon valley. For the host range of *Cuscuta reflexa* Roxb., 50 angiospermic species of 27 families have been recorded in the presnt communication.

839. **Rawat, B. 2013.** *Changes in Vegetation Diversity and Plant Response in Nanda Devi Biosphere Reserve over the Last Two Decades*. Ph. D. Thesis, Kumaun University, Nainital. (unpublished)

840. **Rawat, B. & Joshi, M. 2014.** "Nanda Devi Biosphere Reserve as a successful example of old traditions and new approaches in long-term research and their analyses". *Int. J. Advanced Res.* 2(4): 245–256.

Abstract: The concept of Biosphere Reserves (BRs) is to deal with one of the most important questions of reconciling the conservation of biological diversity and consequently promoting economic and social development and maintenance of associated cultural values. This study focuses on identification of the research strength and gaps in Nanda Devi Biosphere Reserve (NDBR), Uttarakhand, India with a point of view of global Biosphere Reserve concept (Seville Strategy for 21st century) for how the BR could be reoriented to meets the requirement of a new generation BR. Out of 676 research publications chosen for the compilation, synthesis and review from Indian Himalayan Region (IHR), NDBR showed remarkable contribution (43%) as compared to other six HBRs. Moreover, analysis of 283 research publications on different aspects of biodiversity in NDBR, revealed its strength in terms of biodiversity and scope of research. The review of two decades (1990-2010) available literature showed that NDBR contributes to the needs of society as a whole, by showing a way to a more sustainable future. Outcomes of this study have proven NDBR as a successful candidate among old tradition BRs as it accomplishes major goals set for the new generation BRs (Seville Strategy for 21st century).

841. **Rawat, B., Gairola, S. & Bhatt, A. 2010.** "Habitat characteristics and ecological status of *Paeonia emodi* Wallich ex Royle: A high value medicinal plant of West Himalaya". *Med. Pl. Int. J. Phytomed. & Related Industries* 2(2): 139–143.

Abstract: In the present study, the habitat characteristics and ecological status of *Paeonia emodi* Wallich ex Royle a high value Himalayan medicinal plant were examined using field investigations in a part of Nanda Devi Biosphere Reserve, India. We surveyed 14 possible habitats occupied by P. emodi. Among them the species was recorded from 3 habitats under the canopy of *Quercus floribunda* and Mixed Oak deciduous forest. Based on phytosociological study, the density of *P. emodi* ranged from 1.6 to 2.4 individuals/m^2 and frequency from 76 to 80%. Moreover, the result revealed localized distribution of target species in the wild. Considering these preliminary results, more research in possible habitats of the species in different region would clearly give an understanding of its ecology including habitat specificity.

842. **Rawat, B., Gairola, S. & Rawal, R.S. 2015.** "Assessing conservation values of forest communities in Nanda Devi Biosphere Reserve: Plant diversity, species distribution and endemicity". *J. Mountain Sci.* 12(4): 878–890.

Abstract: Present study has been conducted in a biodiversity rich Nanda Devi Biosphere Reserve between 2000-3800 m in two different forest physiognomy holding sites to analyze the structure and composition of the forest communities including richness of native, non native and endemic species, and suggest conservation values at community and reserve level. A total of 60 sites were sampled and grouped in 11 and 8 communities for two representative sites Pindari-Sunderdhunga-Kafni (PSK) and Lata-Tolma-Phagti (LTP) respectively. From the sampled sites, 451species (11.8%; 53 trees; 17.71%; 80 shrubs; and 70.51%; 318 herbs) have been recorded. In general, PSK site represented 73.6% and LTP site represented only 54.9% of the total plant species recorded in the study area. Out of total species in PSK site, native species contributed 59.6 % (198 spp.) and 24.7% species were endemic and near endemic. In LTP site, 66.5% species were Himalayan natives and 33.5% were endemic and near endemic. The species richness ranged from 4-23 ind ha^{-1} (tree), 3-18 ind ha^{-1} (sapling), 5-19 ind ha^{-1} (seedling) in PSK site and 4-18 ind ha^{-1} (tree), 4-11 ind ha^{-1} (sapling), 4-16 ind ha^{-1} (seedling) in LTP site. The density ranged from 260-535 ind ha^{-1} (tree), 145-633 ind ha^{-1} (sapling), 1450-8170 ind ha^{-1} (seedling) in PSK site and 599-1211 ind ha^{-1} (tree), 70-951 ind ha^{-1} (sapling), 470-1665 ind ha^{-1} (seedling) in LTP site. Species diversity for trees ranged from 0.73-3.37, saplings, 0.64-2.67, seedlings, 0.70-2.51, shrubs, 1-2.34 and herbs, 2.02-3.21 in PSK site and 0.63-1.61, saplings, 0.76-1.36, seedlings, 0.35-1.79, shrubs, 0.98-2.73 and herbs, 2.48-3.61 in LTP site. These recorded values were almost comparable with the studies conducted in sub-tropical, temperate and sub-alpine regions of the west Himalaya. In some cases the values were slightly higher than the reported values. The important communities with high conservation values have been identified based on different ecological parameters and species distribution. Among, all the prioritized communities, Mixed Silver fir-*Rhododendron*-Maple community in PSK site and *Taxus wallichana-A. pindrow* mixed community in LTP site supports maximum richness and density of native and endemic species. This study calls for development of adequate strategy and action plan for the conservation and management of habitats, species, and communities under changing climate and socio-economic scenarios, so that sustainable utilization of the species could be ensured.

843. **Rawat, B., Gairola, S., Chandra Sekar, K. & Rawal, R.S. 2014.** "Community structure, regeneration potential and future dynamics of natural forest site in part of Nanda Devi Biosphere Reserve, Uttarakhand, India". *American J. Pl. Sci.* 8(7): 380–391.

Abstract: Realizing the overarching values of forests and considering their depletion at unprecedented rate, conservation of forests has emerged as the prime objective across the globe. Forest vegetation of Pindari-Sunderdhunga-Kafni (PSK), a protected area, part of Nanda Devi Biosphere Reserve in west Himalaya was analyzed for structure, composition and development of future compositional patterns. Forest vegetation surveys were carried out enumerating ten 10x10m quadrat for tree species in each of 30 forest stand complemented by shrub (five 2x2m quadrat) and herb (ten 1x1m quadrat) surveys within each stand. Floristic richness reveals 332 plant species from 11 representative forest communities. Broadly the demographic profiles exhibited progressive structures suggesting long term persistence of the communities/ species. Differences in regeneration behavior of various species are indicative of future structure and dynamics of the communities. Data sets in the present study establishing target site in NDBR as potential sites for long-term ecological monitoring under various change scenarios.

844. **Rawat, B., Gairola, S., Chandra Sekar, K. & Rawal, R.S. 2015.** "The present status and future prospects of forest vegetation in part of Nanda Devi Biosphere Reserve (a World Heritage Site), India". *J. Forest. Res.* 26(4): Doi: 10.1007/s1l676-0l5-0109-x.

Abstract: We studied forest vegetation at Lata–Tolma–Phagti, a protected area and part of Nanda Devi Biosphere Reserve in the western Himalaya. We analyzed community composition, population structure, regeneration patterns, and projected development of future compositional patterns. We sampled ten 10 × 10 m quadrat for tree species in each of 30 forest stands. We sampled shrubs in ten 5 × 5 m quadrat, and herbs in twenty 1 × 1 m quadrat within each forest stand. We recorded 248 plant species from 8 forest communities. Broadly the demographic profiles at study sites exhibited progressive structures suggesting long term persistence of the communities/species. Density–diameter distribution revealed greater proportions of seedlings and a significant decline ($P < 0.05$) in the proportion of trees in older age/ size classes. Of the 23 recorded tree species, 13.0 % showed good, 52.2 % fair, 26.1 % poor and 8.7 % no regeneration. Differences in regeneration by species are indicative of future forest structure and dynamics. Assessment of changes in structure of forest types provides baseline data for development of priorities for conservation of other representative landscapes in the reserve as well as in the Himalaya.

845. **Rawat, B.S. 1987.** "Flowering of bamboos". *Indian Forester* 113(11): 760–761.

846. **Rawat, D.S. 2010.** "Uphill journey of the plants in Himalaya". *Curr. Sci.* 99(12): 1644–1645.

847. **Rawat, D.S. 2011.** "Elevational reduction of plant species diversity in high altitudes of Garhwal Himalaya, India". *Curr. Sci.* 100(6): 833–836.

848. **Rawat, D.S. 2012.** "Flowering phenology on altitudinal gradient in the Himalaya". *Curr. Sci.* 103(11): 1281–1284.

849. **Rawat, D.S. & Gaur, R.D. 2004.** "Floral preformation in alpine plants of the Himalaya". *Curr. Sci.* 86: 1481–1482.

850. **Rawat, D.S. & Gaur, R.D. 2007.** "Habitat diversity and distribution of alpine plants in Uttarakhand Himalaya". *Pl. Morph. Biotechnol.*: 37–52.

851. **Rawat, D.S., Bhandari, B.S. & Gaur, R.D. 2001.** Vegetational Wealth. In: Kandari, O.P. & Gusain, O.P. (Eds.), *Vegetation Wealth of Garhwal Himalaya– Nature Culture and Society.* Transmedia, Srinagar. Pp. 69–92.

852. **Rawat, D.S., Dangwal, L.R & Gaur, R.D. 1993a.** "The growth pattern of *Pegaeophyton garhwalensis* (Brasssicaceae)". *J. Bombay Nat. Hist. Soc.* 92(2): 287–289.

853. **Rawat, D.S., Dangwal, L.R & Gaur, R.D. 1993b.** Plant communities of alpine habitats with special reference to Garhwal Himalaya. In: Pangety, Y.P.S. & Rawal, R.S. (Eds.), *High Altitudes of the Himalaya: Biogeography, Ecology and Conservation.* Gyanodaya Prakashan, Nainital. Pp. 191–203.

854. **Rawat, D.S., Rawat, A.S. & Gaur, R.D. 1993c.** Human activities and alpine plants: An impact assessment. In: Rajwar, G.S. (Ed.), *Garhwal Himalaya– Ecology and Environment.* Ashish Publ., New Delhi. Pp. 107–130.

855. **Rawat, D.S., Tiwari, J.K. & Tiwari, P. (2016) 2017.** "Invasive alien flora of western Ramganga valley, Uttarakhand". *Phytotaxonomy* 16: 111–114.

Abstract: Present study deals with the diversity of invasive alien plants in the montane zone of western Ramganga valley, district Chamoli, Uttarakhand, India. The study resulted in documentation of a total of 48 species belonging to 41 genera in 23 families. The recorded species are enumerated with local names, habits, habitats, altitudinal distribution, availability status, flowering and fruiting time and indigenous uses.

856. **Rawat, D.S., Tiwari, J.K., Tiwari, P. & Singh, H. 2016.** "Floristic diversity of montane zone: western Ramganga valley, Uttarakhand, India". *J. Econ. Taxon. Bot.* 40(3-4): 104–125.

Abstract: Floristic study of the montane zone in Western Ramganga Valley (Chamoli district, Uttarakhand) resulted in documentation of 651 species of Spermatophyta belonging to 444 genera of 131 families. Among these, 29 species (4.45%) under 20 families are new records to Chamoli district. The dominant family is Asteraceae with 49 species followed by Poaceae, Fabaceae and Rosaceae. Among the genera, *Desmodium* was dominant with eight species, followed by *Ficus, Rubus* and *Polygonum* with six species each. The growth forms, herbs with 389 species (59.7%) dominate the valley followed by shrubs (18.59%), trees (14.29%) and climbers (7.37%). There are 9.22% species found rare, 36.71% not common and 54.07% common.

857. **Rawat, D.S., Tiwari, J.K., Tiwari, P., Ballabha, R. & Rana, C.S. 2013.** "Plant diversity in the Lohba Range of Kedarnath Forest Division in Garhwal Himalaya, Uttarakhand, India". *Ann. Pl. Sci.* 2(8): 302–320.

Abstract: The present study was aimed to document the plant diversity (angiosperms and gymnosperms) of Lohba range of Kedarnath Forest Division in Uttarakhand, India. The study area harbours 415 plant species belonging to 313 genera and 108 families, of which 85% species were dicotyledons, 14% monocotyledons and 1% gymnosperms. Recorded plant species has been enumerated with their families, local names, plant types, growth habits, life forms, altitudinal distribution, flowering and fruiting periods, indigenous uses and availability status. Asteraceae (36 species) was dominant family, followed by Rosaceae (24), Fabaceae (23), Poaceae (19) and Lamiaceae (17). Maximum number of species (7) were recorded for the genus Ficus, followed by Prunus (6), Brassica (5), Citrus (5) and Crotalaria, Euphorbia, Ipomoea, Quercus, Rubus (4 species each). Plants belong to different growth habits in the Lohba range, herbs were 40%, shrubs (22%), trees (22%), climbers (10%) and grasses/ sedges (5%). The dominant life form was theophyte (33%), followed by microphanerophyte (15%), nanophanerophyte (14%), geophyte (13%), chamaeophyte (9%) and epiphyte (2%). On the basis of availability status, 18.80% plants were abundant in the area whereas 53.73% were common and 27.47% uncommon. Besides upmounting alien species (*Eupatorium adenophorum, Lantana camara, Parthenium hysterophorus*, etc), several anthropogenic activities may lead to the loss of rich diversity of the area.

858. **Rawat, D.S., Tiwari, J.K., Tiwari, P., Nautiyal, M., Parveen, M. & Singh, N. 2018.** "Tree species richness, dominance and regeneration status in Western Ramganga Valley, Uttarakhand Himalaya, India". *Indian Forester* 144(7): 595–603.

Abstract: The present study deals with the community structure and regeneration status of tree species in Western Ramganga Valley, between altitudes 1200–3100m asl. Six forest stands (three on each flank of river Ramganga) were selected at three altitude viz. lower, middle and upper temperate. Composition of trees, saplings and seedlings were assessed through quadrat method. A total 120 quadrats (10m×10m size) for trees, 240 quadrats (size 5m×5m) for saplings and 480 quadrats (size 1×1 m) for seedling laid in the study area. We used circumference (C) to differentiate three layers of a species into adult (C e" 30 cm), sapling (C 10–30 cm) and seedling (C< 10 cm). We also observed the distribution of tree individuals into successive diameter classes i.e., 10–20, 21–30, 31–40 cm, etc. to assess the regeneration of tree layer at various sites. A total of 42 species of trees belongs to 33 genera and 19 families from six forest stands, trees were represented by 39 species, 37 seedlings and saplings by 34 species. Out of total 42 tree species, good regeneration status recorded for 10 species, fair for 22 species and poor regeneration status for 4 species. Three species (*Cornus macrophylla, Taxus wallichiana* and *Toona ciliata*) revealed as not regenerating species while four species (*Acer caesium, Albizia julibrissin, Betula alnoides, Carpinus viminea*) as poorly regenerating from the study area. Thus, species with poor and not regeneration status needs proper to check their degradation from the area in future.

859. **Rawat, G.S. 1983.** *Studies on the High Altitude Flowering Plants of Kumaun Himalaya.* Ph.D. Thesis. Kumaun University, Nainital. (unpublished)

860. **Rawat, G.S. 1998.** "Temperate and alpine grass lands of the Himalaya: Ecology and conservation". *Parks* 8(3): 27–36.

861. **Rawat, G.S. 2000.** Alpine Vegetation of North Western India: An Ecological Review. In: Richard, C. & *al.* (Eds.), *Grassland Ecology and Management in Protected Areas of Nepal* 3: 32–44. ICIMOD, Kathmandu, Nepal.

862. **Rawat, G.S. 2005a.** "Terrestrial vegetation and ecosystem coverage within Indian protected areas". *Natl. Acad. Sci. Letters* 28(7): 241–250.

Abstract: Much concern has been raised regarding conservation of Biological Diversity world over in recent years. As per India's commitment under UN Convention on Biodiversity, a National Biodiversity Strategy and Action Plan has been drafted which covers a large number of themes. Conservation of terrestrial ecosystems and representative vegetation types through protected area network is one of the strategies. This article deals with key features of various terrestrial ecosystems, characteristic vegetation and conservation issues in various biomes of India. It is noted that conservation of habitats, key vegetation types and larger ecosystems have not been formalized so far owing to poor documentation of these components. Understanding vegetation processes and ecosystem dynamics both outside and inside the existing PAs would be essential for the effective management of natural ecosystems.

863. **Rawat, G.S. 2005b.** *Alpine Meadows of Uttaranchal: Ecology, Landuse and Status of Medicinal & Aromatic plants.* Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: This illustrated publication is based on a recent ecological survey conducted across the alpine region of Uttaranchal by the author. The publication deals with the salient findings of the expedition within the alpine region of Uttaranchal pertaining to inventory of alpine meadows, locally known as Bugyals, current landuse practices, status of medicinal and aromatic Plants, observations on the wildlife and their habitats, grass cover within alpine region and recommendations for the conservation and management of Bugyals in the state. Besides floral and ecological characteristics of various Bugyals, this publication gives detailed profile of 100 medicinal plants found in the alpine region of Uttaranchal along with their distribution maps. Major chapters in the book include (i) An introduction to the Alpine Vegetation and Bugyals, (ii) The Ecological Expedition, (iii) Status of Alpine Meadows and Landuse Practices, (iv) Status of Medicinal and Aromatic Plants, (v) Wildlife and their habitats, (vi) Alpine Grass Cover of Uttaranchal.

864. **Rawat, G.S. 2007.** *Alpine Vegetation of the Western Himalaya: Species Diversity, Community Structure, Dynamics and Aspects of Conservation.* D. Sc. Thesis, Kumaun University, Nainital.

865. **Rawat, G.S. 2014.** Patterns of plant species richness, diversity and endemism in the alpine zone of western Himalaya. In: Panda, C. & Ghosh, C. (Eds.), *Diversity and Conservation of Plants and Traditional Knowledge*. Prof. A.P. Das felicitation volume. Bishen Singh Mahendra Pal Singh, Dehradun. Pp. 253–268.

Abstract: The alpine zone spreads over nearly 33 % of the Indian Himalaya and represents one of the fascinating biomes on account of distinct landscape and habitat features manifested by peculiar structural and functional diversity of plant communities. Despite a large number of floristic surveys, very few published accounts are available on the patterns of species richness, diversity and endemism across altitudinal and latitudinal gradients. This paper is based on extensive ecological surveys of alpine vegetation in the Western Himalaya (the Indian states of Uttarakhand, Himachal Pradesh, and Jammu and Kashmir) conducted over more than a decade. This part of the Himalaya has been traditionally recognized as a distinct phytogeographic region. Extensive surveys of alpine vegetation were conducted during summer-monsoons of years 1998 to 2007 covering the Greater and Trans-Himalayas (long expeditions, opportunistic sampling, intensive eco-floristic studies at representative sites). Phytosociological data from >530 sampling sites (with 10 random quadrats of 1 m 2 within a homogeneous vegetation patch at each site), covering all three states were used to estimate species richness, species diversity, evenness and beta diversity across various physiognomic units, habitat types and altitudes. It was found that the number of endemic species decreased with increasing altitude. Most of the endemic species (70 %) in the alpine areas occupied mesic and wet habitats and even within the Trans-Himalaya region, majority of the endemic species were found in the sheltered habitats less exposed to wind and desiccation which is contrary to the findings of previous studies.

866. **Rawat, G.S. & Bhainsora, N.S. 1999.** "Woody vegetation of Shivaliks and outer Himalaya in North western India". *Trop. Ecol.* 40(1): 119–128.

Abstract: Structure and composition of forests across the Shivaliks, Doon valley and outer Himalaya in Dehradun district, North Western India were studied using stratified random plots. Richness of woody species, Importance Value Index (IVI) of trees, and regeneration of sal (*Shorea robusta* Gaertn.), the climax species of the region, have been compared. Based on 'TWINSPAN' analysis 17 groups or tree associations were segregated with Eigen values ranging form 0.216 to 0.729 which largely follow increasing rainfall and moisture gradient. Absence of *Anogeissus latifolia* in the outer Himalaya marked the difference from the tree associations of other two zones. The richness of woody species was highest in Shivaliks (62) followed by Doon valley (56) and outer Himalaya (54). Of 1001 individuals of sal measured for GBH, the pole size (10-20 cm girth class formed about 4% of the population. Outer Himalaya had significantly higher density of sal saplings (< 10 cm girth class) compared to Shivaliks (paired $t = 2.62$ $p < 0.05$) and Doon Valley ($t = 2.29$ $p < 0.05$) but the latter two zones were similar in sapling densities. Sal attained highest girth in Doon valley ($x = 126.2 \pm 12.3$ cm) and lowest in the outer Himalaya ($x = 56.0 \pm 6.4$ cm). Within Shivaliks the tree densities (ha-1) varied among valley bottom (260.9 ± 64.1), middle slope (265.7 ± 77.9) and Shivalik ridge (254.6 ± 100.7). However, tree densities in Doon valley (640.0 ± 253.9 ha-1) and outer Himalaya (643.7 ± 257.7 ha-1) were much higher compared to Shivaliks. Areas disturbed due to lopping and cutting, particularly in Doon valley and outer Himalaya were dominated by *Lantana camara* Linn., an exotic shrub. Though *Lantana* thickets seem to protect sal seedlings from the frost and other injuries, overall plant species diversity was very low in such areas. Influence of terrain, topography and protection has been discussed along with the conservation implications.

867. **Rawat, G.S. & Chandola, S. 2006.** Rapid Mapping Exercise for Quantification of Medicinal Plants: Lessons from Uttaranchal. In: Kumar, S. (ed.), *Plant Science Research in India: Challenges and Prospects*. Botanical Survey of India, Dehradun. Pp. 69–99.

868. **Rawat, G.S. & Pangtey, Y.P.S. 1987e.** "Floristic structure of snowline vegetation in Central Himalaya, India". *Arct. & Alp. Res.* 19(2): 195–201.

Abstract: An extensive floristic survey was made during the years 1981-1983 near the snowline areas of Central Himalaya. In this sector of Himalaya, the snowline generally varies between 5400 and 5600 m asl. The area has been broadly divided into three geobotanical subunits: (1) chocolate-colored limestone ridges, (2) old sandur, and (3) pioneer environments. *Christolea himalayensis* (Camb.) Tafri (Brassicaceae) was recorded at the highest elevation, i.e., 5600 m. In all, 60 angiosperm taxa belonging to 18 families were found. Six dominant families of this zone are Brassicaceae (10 spp.), Asteraceae (8 spp.), Ranunculaceae (7 spp.), Poaceae (4 spp.), Fumariaceae (3 spp.), and Caryophyllaceae (3 spp.). The life form spectrum of the flora reveals that 46.66% species are chamaephytes, 30% hemicryptophytes, 18.33% geophytes, and only 5% therophytes; pteridophytes and gymnosperms were not recorded from the snowline areas. Lichens, algae, and mosses are frequent. The

seasonality, habitats, and altitudinal distribution of each species were studied. The vegetation seems to be ecologically similar to that of arctic and tundra regions.

869. **Rawat, G.S., Kala, C.P. & Uniyal, V.K. 2001.** Plant species diversity and community composition in the Valley of Flowers National Park, Western Himalaya. In: Pandey, P.C. & Samant, S.S. (Eds.), *Plant Diversity of the Himalaya*. Gyanodaya Prakashan, Nainital. Pp. 277–290.

870. **Rawat, G.S., Kalakoti, B.S. & Pangtey, Y.P.S. 1982.** "A note on the bugyals of Kumaun". *Himal. Res. Develop.* 1(1): 99–100.

871. **Rawat, G.S., Sathyakumar, S. & Prasad, S.N. 1999.** "Plant species diversity and community structure in the outer fringes of Kedarnth Wildlife Sanctuary, Western Himalaya: Conservation implications". *Indian Forester* 125(9): 873–882.

Abstract: Studies on the plant species diversity and community structure were carried in the outer fringes (1550 m – 1900 m) of Kedarnath Wildlife Sanctuary, Western Himalaya. Five sites were selected along the gradient of human use which represented various stages of Oak-Rhododendron (*Quercus leucotrichophora- Rhododendron arboreum*) community. The tree density varied significantly among the sites (ANOVA $p<0.001$) but there was no significant variation in the shrub density. The diversity of tree and shrub species have been compared separately at various sites using Shannon-Wiener Index. The number of woody species was highest in the moderately disturbed site where as lowest in the Oak forest protected and artificially regenerated by the villagers. Moderately disturbed site showed best regeneration of ban oak. However, maximum tree species diversity, structural (and possibly functional diversity) are exhibited by the old growth forest. Indicators of different seral stages have been identified and conservation implications discussed.

872. **Rawat, J.K., Semwal, J.K. & Purohit, A.N. 1985.** *Blossoming Garhwal Himalaya*. New Delhi.

873. **Rawat, K.K., Gupta, D. & Sahai, K. 2017.** "Flowering behaviour of *Mallotus philippensis* (Lam.) Muell.Arg. in three forest communities of Katerniaghat Wildlife Sanctuary, Bahraich, Uttar Pradesh, India". *Indian J. Forest.* 40(4): 403–407.

Abstract: Flowering behaviour of *Mallotus philippensis* was studied in three forest communities, viz., Sal forest, Teak plantation and Dry miscellaneous forest of Katerniaghat Wildlife Sanctuary, Bahraich, Uttar Pradesh. It was observed that though its vegetative performance is well adapted under different conditions of the forest, reproductive behaviour was greatly affected by the nature of the forest type. Dry miscellaneous forest was the best habit for *Mallotus philippensis* with highest flowering and flowering traits while Teak plantation had lowest.

874. **Rawat, R.S. 2001.** "Phytosociological studies of woody vegetation along an altitudinal gradient ina montane forest of Garhwal Himalaya". *Indian J. Forest.* 24(4): 419–426.

Abstract: In the present study, various phytosociological attributes of woody vegetation were analysed along an altitudinal gradient from 1700-2100 m above msl in a mountain flank of Garhwal Himalayas. The flank was surveyed for floristic composition, distribution pattern, species diversity and dominance at each stratum of woody vegetation. Maximum number of tree, sapling and seedling species were recorded

on upper slope and minimum number on lower slope. *Alnus nepalensis, Lyonia ovalifolia, Quercus leucotrichophora, Rhododendron arboretum* (tree species) and *Berberis aristata* (shrub species) were present on all slopes. *Rhododendron arboretum* was dominant species on upper and middle slopes whereas *Quercus leucotrichophora* was dominant on lower slope in the tree stratum. Majority of the woody species showed contagious distribution pattern followed by random. Diversity index and concentration of dominance values confirmed the temperate nature of this forest.

875. **Rawat, V.R.S. & Kumar, P. 1989.** "Ecological studies of some *Cedrus deodara* forests in western Himalaya, India". *Indian J. Forest.* 12: 145–150.

876. **Rikhari, H.C., Adhikari, B.S. & Rawat, Y.S. 1997.** "Woody species composition of temperate forests along an elevational gradient in Indian Central Himalaya". *J. Trop. Forest Sci.* 10(2): 197–211.

Abstract: The species composition, community patterns and diversity of temperate forests along an elevational gradient of 2000-3300 m above sea-level in the Pindar catchment of Central Himalaya were studied. On the basis of the importance value index (IVI) of the dominant species, eight forest types were identified. These were alder (*Alnus nepalensis*), mixed deciduous-evergreen, mixed evergreen-deciduous, silver-fir (*Abies pindrow*), maple (*Acer cappadocium*), burans (*Rhododendron arboreum*), kharsu oak (*Quercus semecarpefolia*) and birch (*Betula utilis*) forests. The total basal area and biomass for trees were recorded in the ranges of 10.5-81.5 m2 ha^{-1} and 49.3-630.7 t ha^{-1} respectively. *Arundinaria falcata* was the dominant shrub species in most of the forest types. In the three-dimensional ordination based on species composition, stands of different forests showed continuity with elevation except for the birch forest, whereas the ordination based on structural/functional features exhibited less separation of forest types. Tree species diversity and beta diversity across the forest types were higher for the tree layer compared to the shrub layer.

877. **Rikhari, H.C., Chandra, R. & Singh, S.P. 1989.** "Pattern of species distribution and community characters along a moisture gradient within an Oak zone of Kumaun Himalaya". *Proc. Indian Natl. Sci. Acad.* B55(5&6): 431–438.

Abstract: Oak forest communities distributed along a soil moisture gradient within an elevational range of 1450-2450 m in the Central Himalaya wre studied. Between the two major osk species which realised most of the importance values in the stands, *Quercus leucotrichophora* had its centre towards the lower part of the moisture gradient, whereas *Q. floribunda* mixed with this species, towards the higher part of the moisture gradient. Species diversity increased with increasing soil moisture and its values were in the range of 0.33-2.91 for trees and 1.80-2.87 for shrubs.

878. **Rikhari, H.C., Negi, G.C.S. & Singh, S.P. 1993.** Species and community diversity pattern in an alpine meadow of Central Himalaya. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies*. G.B. Pant Institute of Himalayan Environment and Development, Almora. Pp. 205–218.

879. **Rikhari, H.C., Negi, G.C.S., Ram, J. & Singh, S.P. 1993.** "Human induced secondary succession in an alpine meadow of Central Himalaya, India". *Arct. & Alp. Res.* 25(1): 8–14.

Abstract: Secondary succession in an Indian Central Himalayan alpine meadow above timberline within an elevational range of 3100 to 3750 m was studied. In the ordination graph, the stands of two seres (*Trachydium*-forb, I sere and the forb-*Danthonia*, II sere) were clearly separated. In both the seres, relative importance of pioneer species decreased and that of late successional species increased along the gradient of age. Relative importance of tall forbs decreased from younger to older sites, but a reverse trend was observed for cushion and sprawling forbs. Grasses and sedges also increased throughout the age gradient in II sere. Total shoot density and species richness increased and that of biomass decreased along the gradient of age, while diversity peaked in the middle part of the gradient.

880. **Rikhari, H.C., Tewari, J.C., Rana, B.S. & Sharma, S. 1991.** "Woody vegetation and regeneration status in a mixed forest of Kumaun Himalaya". *Indian Forester* 117(4): 274–283.

Abstract: Woody species composition, diversity and population structure of tree species of an oak forest is described. *Quercus leucotrichophora* and *Q. floribunda* are predominant tree species. The diversity is generally higher for trees than for saplings. *Q. leucotrichophora* exhibit poor regeneration, whereas frequent reproduction is shown by *Q. floribunda*. Density-diameter distribution curve for whole forest exhibit a hump in the centre (around intermediate size classes) having concave appearance towards left and convex towards right side in the semilogrithmic graph.

881. **Rowal, A.S., Pharswan, A.S. & Nautiyal, M.C. 1992.** "Propagation of *Aconitum atrox* (Bruhl) Muk. (Ranunculaceae), a regionally threatened medicinal herb". *Econ. Bot.* 46(3): 337–338.

882. **Roy, G.P. 1971.** "Key to common grasses of Varanasi". *J. Scientific Res. Benaras Hindu Univ.* 22: 85–91.

883. **Roy, G.P. 1996.** Indo-Gangetic Plains. In: *Flora of India Introductory volume,* Part I. Hajra, P.K., Sharma, B.D., Sanjappa, M. & Shastry, A.R.K. (Eds.), Botanical Survey of India, Kolkata. 1: 220-224.

884. **Roy, R.K., Rajendran, A. & Sharma, S.C. 1998.** "A horto-taxonomical account of *Plumeria* collection at National Botanical Research Institute, Lucknow, India". *J. Econ. Taxon. Bot.* 22(3): 671–675.

Abstract: Plumerias are one of the popular ornamentaltrees of the tropical regions. Their exquisite flowers in various shades with pleasant fragrance are remarkable for producing bio-aesthetic effect. This paper deals with the horticultural importance as well as taxonomic account of the eight axa of *Plumeria* growing in the Botanic Garden of N.B.R.I. The study will help in the proper identification of the much confused species of Plumerias on the basis of key provided and selecting them for landscaping.

885. **Sah, S., Pali, C.B. & Rawat, J.S. 1990.** "Studies on luxuriant weed *Oxalis latifolia* H. B. & K. from Kumaun Himalaya". *Geobios, New Rep.* 9: 87–89.

Abstract: In the present paper *Oxalis corniculata* H.B. & K. has been collected from different parts of Ranikhet at the height of 1700-1800 m asl. Considering the importance of vitamin C in medicine as well as in diet, the plant was analysed for vitamin C content alongwith oxalic acid. The botanical description of the plant has also been provided.

886. **Sahai, B. & Kimothi, M.M. 1994.** Remote sensing of Nanda Devi Biosphere Reserve for biodiversity conservation. In: Proceedings of Seminar on Biodiversity Conservation. National Conservation Congress WWF, India. Pp. 131–137.

887. **Sahai, R. & Sinha, A.B. 1968.** "A supplement to the aquatic and swampy vegetation of Gorakhpur". *Indian Forester* 94(11): 819–821.

Abstract: The present paper is a supplement to the 'Ecological studies on aquatic and swampy vegetation of Gorakhpur- a survey' (Sen, 1959). The authors have collected and identified additional forty eight species of plants from the various lakes, ponds, swamps and low lying areas existing in their vicinity in the district. Out of the 48 species enumerated in the present paper, 2 belong to pteridophytes, 20 to monocotyledons and remaing 26 to dicotyledons.

888. **Sahai, K. 1998.** "An observation on productive performance of *Pinus echinata* Mill. introduced in Kumaon Himalayan region of India". *Indian J. Forest.* 21(1): 19–22.

Abstract: From six best gorowing exotic pine species *P. echinata* Mill. was studied in detail continuously for 9 years for its reproductive performance in relation to male and female cone-set, seed-set and seed qualities. The species has apparently adapted well to the Himalayan climate in Kumaon. Fluctuation in reproductive performance over the years is probably due to the climate.

889. **Sahni, K.C. 1982.** Himalayan flora and physiography: A study in contrast. In: Paliwal, G.S. (Ed.) *The Vegetational Wealth of the Himalayas.* Puja Publishers, New Delhi. Pp. 194–200.

890. **Sahni, K.C. & Raizada, M.B. 1957.** "Observations on the vegetation of Pancha Chulhi". *Indian Forester* 81(5): 300–317.

Abstract: The vegetation of Pancha Chulhi is divided into Cypress forests, mixed forests, fir forests, high level fir forests (including birch forest), alpine scrub, alpine meadow vegetation of the stony desert and vegetation around perpetual snow. Three new records for Kumaon were discovered. List of plants which are collected from this area have also been given.

891. **Sahni, K.C., Naithani, H.B., Singh, S., Biswas, S. & Das, B. 1996.** *Trees of Chandbagh: Doon's National Heritage.* Konark Pub., New Delhi.

892. **Saini, D.C. 1990.** "Additions to the flora of Lucknow". *J. Econ. Taxon. Bot.* 14(3): 561–568.

Abstract: The present communication deals with 85 species as additions to the flora of Lucknow belonging to 2 genera and 38 families alonwith 24 species new to flora of Upper gangetic plain. The plats are arranged according to Bentham & Hooker's system of classification with their correct name, habitat and locality.

893. **Saini, D.C. 1993.** Addition to the flora of Upper Gangetic Plain. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.,* Addl. Ser.] Bishen Singh Mahendra Pal Singh, Dehradun. 4: 253–265.

Abstract: Thirty five plant species of 28 genera belonging to 22 families have been reported for the first time for the flora of Upper Gangetic plain from Gorakhpur district of Uttar Pradesh.

894. **Saini, D.C. 1996.** "Flora of Gorakhpur, checklist- I (Ranunculaceae to Plumbaginaceae)". *J. Econ. Taxon. Bot.* 20(1): 35–83.

Abstract: The ckecklist embodies an enumeration of 1230 plant species including 40 species as additions to the flora of Gorakhpurensis and 118 species as nomenclatural changes alongwith corrections in authors citation. The checklist is prepared into two parts. The first part comprises about 520 plant species of 306 genera belonging to 68 families from Ranunculaceae to Plumbaginaceae is presented here.

895. **Saini, D.C. 2005a.** "Flora of Bahraich district, Uttar Pradesh -I". *J. Econ. Taxon. Bot.* 29(3): 528–532.

Abstract: A detailed floristic survey of Bahraich district of Uttar Pradesh has been made and 1210 angiospermic plants have been collected from different habitats of entire district. An enumeration of plants has been made with botanical names and their basionyms if any, synonyms, followed by a short description, ecological notes, flowering and fruiting times, place of collection and field number of specimen.

896. **Saini, D.C. 2005b.** "Flora of Bahraich district, Uttar Pradesh -II". *J. Econ. Taxon. Bot.* 29(3): 533–567.

Abstract: A detailed floristic survey of Bahraich district of Uttar Pradesh has been made and 247 species belonging to 158 genera and 44 families (Family Ranunculaceae to Fabaceae) have been collected from different habitats of entire district.

897. **Saini, D.C. 2005c.** "Flora of Bahraich district, Uttar Pradesh -III". *J. Econ. Taxon. Bot.* 29(3): 568–605.

Abstract: A detailed floristic survey of Bahraich district of Uttar Pradesh has been made and 273 species belonging to 148 genera and 24 families (Family Caesalpiniaceae to Plumbaginaceae) have been collected from different habitats of entire district.

898. **Saini, D.C. 2005d.** "Flora of Bahraich district, Uttar Pradesh -IV". *J. Econ. Taxon. Bot.* 29(3): 606–636.

Abstract: A detailed floristic survey of Bahraich district of Uttar Pradesh has been made and 151 species belonging to 89 genera and 18 families (Family Primulaceae to Orobanchaceae) have been collected from different habitats of entire district.

899. **Saini, D.C. 2005e.** "Flora of Bahraich district, Uttar Pradesh -V". *J. Econ. Taxon. Bot.* 29(4): 843–885.

Abstract: A detailed floristic survey of Bahraich district of Uttar Pradesh has been made and 214 species belonging to 27 genera and 34 families (Family Lentibulariaceae to Pontederiaceae) have been collected from different habitats of entire district.

900. **Saini, D.C. 2005f.** "Flora of Bahraich district, Uttar Pradesh - VI". *J. Econ. Tax. Bot.* 29(4): 886–920.

Abstract: A detailed floristic survey of Bahraich district of Uttar Pradesh has been made and 187 species belonging to 90 genera and 16 families have been collected from different habitats of entire district.

901. **Saini, D.C. & Singh, S.K. 1990.** "Additions to the flora of Upper Gangetic plain with their ethnobotanical studies". *J. Econ. Taxon. Bot.* 14(1): 83–104.

Abstract: The present paper deals with 137 plant species of 88 genera and 47 families as new records for Upper Gangetic plains from Basti district in Uttar Pradesh. The ethnobotanical informations of each species have also been furnished.

902. **Saini, D.C., Singh, S.K. & Rai, K. 2010.** *Biodiversity of aquatic and semi-aquatic plants of Uttar Pradesh.* U.P. State Biodiversity Board, Lucknow. Pp. 479.

903. **Saklani, A. & Rao, R.R. 2000.** *Saussurea* DC. in Garhwal Himalaya: Diversity, Distribution and Conservation. In: Pangtey, Y.P.S. (Ed.), *High Altitudes of Himalaya* 2: 323–334. Gyanodaya Prakashan, Nainital.

904. **Samant, S.S. 1987.** *Flora of Central and South Eastern parts of Pithoragarh District.* Ph. D. Thesis, Kumaun University, Nainital, (unpunlished).

905. **Samant, S.S. 1993.** Diversity and status of plants in Nanda Devi Biosphere Reserve. *Scientific and Ecological Expedition to Nanda Devi.* A Report. Wildlife Institute of India (WII), Dehradun and Army Head Quarter, New Delhi. Pp. 54–85.

906. **Samant, S.S. 1998.** Forest types and diversity of fodder resource in Kumaun Himalaya. Proceeding of the Seminar on 'Fodder Problems in Himalayan Region' in India. Pp. 111–123. SHERPA, Lucknow.

907. **Samant, S.S. 1999.** "Diversity, nativity and endemism of vascular plants in a part of Nanda Devi Biosphere Reserve in west Himalaya- I". *Himal. Biosphere Reserve* 1: 1–28.

908. **Samant, S.S. 2002.** "Diversity, distribution, and conservation of orchids of Trans-, North-west and West Himalaya". *J. Orchid Soc. India* 16(1-2): 65–74.

Abstract: The Indian Himalayan region comprises Trans-, North-West, West, Central, and East Himalayan biogeographic provinces and includes parts of Jammu & Kashmir, Himachal Pradesh, Uttaranchal (Garhwal and Kumaun), Sikkim, West Bengal and Arunachal Pradesh states. The region is supposed to be one of the repositories of orchids and East Himalaya (i.e., Arunachal Pradesh) alone harbours 545 species. In view of the conservation and socio-economic (aesthetic, medicinal and economic) values of orchids, an attempt has been made here to: (i) study the diversity and distribution patterns; (ii) identify nativity, endemism and rarity; (iii) identify the socio-economic values; and (iv) suggest appropriate strategy for conservation and management of orchids of Trans-, North-West and West Himalaya. A total of 244 species of orchids belonging to 5 sub-families and 72 genera have been reported. Of these about 97 species are epiphytic in nature. Population assessment of native, endemic and rare-endangered species, identification of host range of epiphytes, identification of Pressure Use Index (PUI) and Sensitivity Index (SI) of host plants, establishment of orchid reserve in the orchid rich areas, promotion of propagation by conventional and *in vitro* methods and involvement of inhabitants in the conservation and management of orchids have been suggested.

909. **Samant, S.S. 2009.** "Diversity and conservation status of orchids in Askot Wildlife Sanctuary, West Himalaya". *J. Orchid Soc. India* 23(1-2): 1–9.

Abstract: The West Himalaya, one of the biogeographical provinces of the Indian Himalayan Region (IHR), forms the transition zone between the northwestern and eastern Himalaya. It supports the biodiversity elements of both the provinces, hence rich in biodiversity. Like other group of plants, the orchids are also well represented here. The Askot Wilkdlife Sanctuary, which connects the Uttarakhand state with Tibet and Nepal, is rich in orchid diversity due to mild climatic conditions, altitudinal range and diverse habitats including host trees for the epiphytic orchids. The Gori valley in the sanctuary is one of the hotspots in Uttarakhand. In view of the ecological and economical importance of the orchids, an attempt has been made to study the diversity and distribution pattern, identify their nativity, endemism, rarity and socio-economic values besides suggesting appropriate strategies for their conservation. A total of 120 species of orchids belonging to 53 genera have been listed based on the surveys and secondary information. The genera *Dendrobium* (10 spp.), *Bulbophyllum* and *Oberonia* (8 spp. Each), *Eria* (7 spp.), *Habenaria* (6 spp.), *Liparis* and *Peristylis* (5 spp. Each), *Herminium* (4 spp.) and *Coelogyne, Cymbidium, Cypripedium, Goodyera, Malxis, Nervilia, Gastrochilus* and *Vanda* (3 spp. each) have contributed most to the orchid diversity. Maximum diversity of orchids is distributed in the subtropical zone (<1800 m); it decreased with increasing altitude. Amongst the species, 70 are native to the Himalayan region, 9 to the Himalayan region and neighbouring countries and 41 non-natives. The species have also been analysed for endemism, rarity and socio-economic values. Population assessment of the native, endemic and rare-endangered species; identification of host range of epiphytes; Pressure Use Index; and Sensitivity Index of host plants; ecologically and economically important orchids; nitification of orchids rich areas as Orchid Conservation Areas; propagation by conventional and *in vitro* methods; and involvement of inhabitants are suggested for conservation and management of orchids.

910. **Samant, S.S. & Joshi, H.C. 2004.** Floristic diversity, community pattern and changes of vegetation in Nanda Devi National Park. In: *Biodiversity Monitoring Expedition Nanda Devi* 2003. Report to the Ministry of Environment & Forests, Govt. of India and Uttaranchal State Forest Department, Dehradun. Pp. 39–54.

911. **Samant, S.S. & Joshi, H.C. 2005.** "Plant diversity and conservation status of Nanda Devi National Park and comparison with highland National Parks of the Indian Himalayan Region". *Int. J. Biodiv. Sci. & Manage.* 1(1): 65–73.

Abstract: This paper addresses the plant diversity and conservation status of Nanda Devi National Park (NDNP) and compares these with the Valley of Flowers National Park (VOFNP) and Great Himalayan National Park (GHNP). In the NDNP, 490 species belonging to 281 genera and 89 families of Angiosperms and Gymnosperms have been recorded. Maximum species were represented in the family Rosaceae, genus *Saxifraga*, altitude zone (3800 m) and alpine pasture/slopes habitat. Twenty-eight families were monotypic. 73% of species were native, 2% were endemic and 34% species were near endemic. Eight species have been recorded in the Red Data Book of Indian Plants and 37 species categorized as Critically Endangered,

Endangered, Vulnerable and Low Risk Near Threatened using IUCN criteria. The comparisons of diversity, nativeness, endemism and rarity of the species of NDNP with VOFNP and GHNP indicated that the species diversity was lowest in the NDNP. However, the richness of native and rare endangered species was higher. The richness of endemic species of NDNP was higher than in the GHNP, but lower than in the VOFNP. Monitoring of plant diversity including populations of rare endangered and endemic species is suggested for the effective management of these National Parks.

912. **Samant, S.S. & Pangtey, Y.P.S. 1994.** "Aquatic, marshy and wetland flora of district Pithoragarh (Kumaon Himalaya)". *J. Econ. Taxon. Bot.* 18(1): 47–54.

Abstract: The present paper enumerates the aquatic, marshy and wetland flowering plants of district Pithoragarh (Kumaun Himalaya). Geographical location and ecological classification of these plants along with flowering period and remark are also given. In all, 159 speces of flowering plants belonging to 92 genera spread over 39 families have been recorded.

913. **Samant, S.S. & Pangtey, Y.P.S. 1995a.** "Diversity of ichthyotoxic plants of Kumaun Himalaya". *Indian J. Forest.* 18(1): 80–86.

Abstract: the present paper deals with 84 ichthyotoxic plants distributed over 68 genera and 43 families used to intoxicate fish. For each species correct binomial name, family, local name, habit, habitat, altitudinal range, parts used and collection number are given. Local method used by the inhabitants of the Kumaun Himalaya is also given.

914. **Samant, S.S. & Pangtey, Y.P.S. 1995b.** Additions to a forest flora for Kumaun. In: Gupta, B.K. (Ed.), The *Higher plants of Indian Subcontinent [Indian J. Bot.,* Addl. Ser.]. 5: 285–315. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: One hundred fifty seven species belonging to 122 genera and 62 families has been reported from Kumaun which are an addition to the Forest Flora for Kumaun.

915. **Samant, S.S., Dhar, U. & Rawal, R.S. 1998.** "Biodiversity status of protected area of West Himalaya I: Askot Wildlife Sanctuary". *Int. J Sustain. Develop. & World Ecol.* 5(3): 194–203.

Abstract: Biodiversity of a protected area of West Himalaya (Askot Wildlife Sanctuary) was studied and analysed for landscape, faunal and floral diversity. The forest and pasture land, ideal habitats for the flora and fauna, covered nearly 52% and 12%, respectively, of total reported area. Among the fauna Himalayan musk deer (Moschus chrysogaster), thar (*Himitragus jemlahicus*), snow leopard (*Panthera uncia*), koklas (*Pucrassia macrolophas*), monal (*Lophophorus impejanus*) and snow cock (*Tetragalus tibetanus*) are threatened species. Plant diversity is represented by 1262 species of vascular plants (Angiosperm 1112, Gymnosperm 7, Pteridophytes 143 taxa). Diversity of the species within families, genera, habitats, communities and along vertical gradient zone was analysed. Maximum diversity existed in the family Orchidaceae (120 taxa), genera *Polystichum* (13 taxa), altitude zone (1001–2000 m; 860 taxa), habitat (forest; 623 taxa) and community (Banj oak: 92 taxa). Seventy-one families were found to be monotypic. Species were further analysed for ethnobotanical use (medicine: 70, edible: 55, fodder: 115, fuel: 31, house building:

13 etc.), domesticated diversity (crops: 19, vegetables: 26, fruits: 16), agroforestry or marginal, threatened and endemic diversity. Similarity in species composition within the habitats indicated maximum similarity in areas of shrubberies and alpine meadows/ slopes (71.65%) and exposed open/grassy slopes and shady moist places (47.32%). 432 (34.2%) taxa are native to Indian Himalaya of which 24 are endemic and 235 are near endemics. 65.8% of taxa are represented in the neighbouring areas and other regions of the globe. Ten taxa occurring in the Sanctuary have been already recorded in the Red Data Book of Indian Plants. Conservation and management of species is focused.

916. **Samant, S.S., Dhar, U. & Rawal, R.S. 2005.** "Diversity, endemism and socio-economic values of the Indian Himalayan Papaveraceae and Fumariaceae". *J. Indian. Bot. Soc.* 84: 33–40.

917. **Samant, S.S., Joshi, S.C. & Arya, S.C. 2000.** "Diversity, nativity, and endemism of vascular plants in Pindari area of Nanda Devi Biosphere Reserve– II". *Himal. Biosphere Reserves* 2(1-2): 1–29.

918. **Samant, S.S., Rawal, R.S. & Dhar, U. 1995.** "Epiphytic orchids of Askot Wildlife Sanctuary in Kumaun Himalaya, India: Conservation Imperatives". *Environm. Conserv.* 22(1): 71–74.

919. **Samant, S.S., Rawal, R.S. & Pangtey, Y.P.S. 1988.** "Aquatic and marshy angiospermic plants of Naini Tal (Kumaun Himalaya)". In: *Perspective in Aquatic Biology*. Gyanodaya Prakashan, Nainital. Pp. 409–416.

920. **Samant, S.S., Joshi, S.C., Arya, S.C. & Pant, S. 2002.** Studies on the structure, composition and changes of the vegetation in Nanda Devi Biosphere Reserve of West Himalaya. Technical Report submitted to the Ministry of Environment & Forests, New Delhi.

921. **Samant, S.S., Joshi, S.C., Pant, S. & Arya, S.C. 2001.** "Diversity, nativity and endemism of vascular plants of Valley of Flowers National Park". *Himal. Biosphere Reserve* 3: 1–17.

922. **Sanjeev, Gera, M. & Sankhayan, P.L. 2006.** "Phytosociological analysis of Arnigad micro-watershed in Mussoorie hills of Garhwal Himalayas". *Indian Forester* 132(1): 19–30.

Abstract: The present study was carried out in Arnigad micro-watershed covering an area of 13.43 km^2 in Mussoorie hills of garhwal Himalayan region. For the purpose of characterising the species composition, vegetation structure and floristic diversity by land use categories, the entire watershed was delineated into four land uses, viz., forest, scrub forest, degraded and agricultural lands. In all, 64 species belonging to 63 genera and 56 families were found to be growing in the micro-watershed. The vegetation nalysis showed that *Quercus leucotrichophora, Acacia catechu, Eucalyptus* spp. And *Juglans regia* were found to be dominant in the forest, scrub forest, degraded and agriculture lands respectively for the tree stratum. Similarly *Berberis aristata* and *Lantana camara* were observed to be dominant in the shrub communities of forest and scrub forests respectively. *Lantana camara* was also found to be dominant in the shrub communities of degraded land. Results of the diversity index, concentration of

dominance and equability of the three land uses, viz., forest, scrub forest and degraded land indicated that maximum diversity was observed in forest with respect to tree stratum followed by scrub forest and degraded lands, whereas in case of shrub and herb strata, scrub forest showed the maximum diversity. The maximum values on dominance were recorded for all the three strata of vegetation on degraded land indicating the presence of single or few species. The vegetation recorded on scrub forest was found to be more equitable compared to vegetation on forest and degraded land.

923. **Saxena, A.K. 1979.** *Ecology of Vegetation Complex of North-western Catchment of River Gola.* Ph. D. Thesis, Kumaun University, Nainital. (unpublished).

924. **Saxena, A.K. & Singh, J.S. 1982.** "A phytosociological analysis of woody species in forest communities of a part of Kumaon Himalaya". *Vegetatio* 50: 3–22.

Abstract: This paper reports on a detailed phytosociological analysis of forests in the NW catchment of the Gola River in Kumaun Himalaya, 29°192 –29°272 N and 79°322 –79°422 E. Fourteen sites and 56 stands at elevations ranging from 1200 to 2523 m and covering the following five forest types were investigated: *Pinus roxburghii*, mixed, *Quercus leucotrichophora, Q. lanuginosa*, and *Q. floribunda*. The basal cover of the forests differed according to slope position and aspect. The three oak forests had more basal cover than the other two, and *Q. lanuginosa* had the most. The performance of individual tree and shrub species and the number of saplings and seedlings differed according to slope position and aspect. The mixed forest had the greatest tree diversity, and among the others diversity increased with increasing basal cover. The diversity of trees, saplings, and herb layer was greatest on aspects with intermediate temperature and moisture conditions; whereas that of shrubs and seedlings increased towards the cooler (and wetter) and warmer (and drier) exposures. There was a positive relation between the diversity of shrubs plus seedlings and trees plus saplings in *P. roxburghii* and mixed forests; whereas this relationship was inverse in the three oak forests. In general, the dominance-diversity curves for the tree layer followed a geometric series conforming to the niche pre-emption situation in communities of low diversity. Among the forests, the regeneration was best in *Q. lanuginosa* and worst in *Q. leucotrichophora*.

925. **Saxena, A.K., Pandey, P. & Singh, J.S. 1982.** "Biological spectrum and other structural, functional attributes of the vegetation of Kumaun Himalaya". *Vegetatio* 49: 111–119.

Abstract: Spectra on life form, leaf size, leaf persistence, flowering season, and shade tolerance of trees in different vegetation types occurring within the north-western catchment of the river Gola in Kumaun Himalaya are presented. The flora of *Quercus leucotrichophora, Quercus lanuginosa* and *Quercus floribunda* forests is phanerophytic, that of *Pinus roxburghii* and mixed forests therophytic. The grassland vegetation is characterized by the largest percentage of hemicryptophytes. The flora of the whole area, is therophytic. The biological spectrum for the entire Kumaun Himalaya is characterized as therohemigeophytic. Among the various altitudinal zones, the tropical has a preponderance of phanerophytes, the temperate and the alpine

of hemicryptophytes. The observations on leaf size indicate that with the exception of *Pinus roxburghii* forest, in all vegetation types, the species with microphylls are greater in number. In this region, the vegetation expression is evergreen, although the tree flora has a considerable content of deciduous elements. In all the forests, the flowering period in most of the trees is vernal. On the basis of relative density, the greatest proportions of adult trees in the *Pinus roxburghii* and *Quercus lanuginosa* forests are shade intolerant, while in the mixed and *Quercus leucotrichophora* forests maximum trees are intermediate in shade tolerance. With the exception of the *Pinus roxburghii* forest, all the forests exhibit the dominance of trees which are shade tolerant at the seedling stage. On the basis of relative density, all forest types, except for *Pinus roxburghii* forest, have 74.5 to 100% trees with the potentiality of vegetative reproduction.

926. **Saxena, A.K., Pandey, U. & Singh, J.S. 1982.** On the ecology of oak forests in Nainital hills, Kumaun Himalaya. In: Singh, J.S. & Gopal, B. (Eds.), *Glimpses of Ecology*. International Scientific Publication. Pp. 167–180.

927. **Saxena, A.K., Singh, S.P. & Singh, J.S. 1985.** "Population structure of forests of Kumaun Himalaya: Implications for management". *J. Environm. Manage.* 19: 307–324.

Abstract: The tree population structure of Kumaun Himalayan forests was analysed through density-diameter relationships. The density-diameter distribution curve for all species in the entire region shows an overall convex appearance (largely second derivative negative). Such a structure reflects predominantly an early successional forest. Management practices have promoted this form of forest over large areas, at the expense of multistratal diverse forests. A marked paucity of old-growth forest is evident. A continuation of the current management and biotic conditions will lead to further replacement of the potential natural vegetation of oaks by successional species such as pine.

928. **Saxena, A.P. & Vyas, K.M. 1993.** "Antimicrobial activity of *Alectra parasitica* A. Rich. Var. *chitrakutensis* Rau". *J. Econ. Taxon. Bot.* 17(1): 55–59.

Abstract: The present paper deals with *in vitro* studies on the antimicrobial testing of different extract/chemical constituents of *Alectra parasitica* A Rich. var. *chitrakutensis* Rau against some human pathogenic bacteria and fungi. The results show that sterol(s) and flavonoid-glycosides possess high antimicrobial property. None of the extract samples was found to antifungal.

929. **Saxena, B.K. & Gupta, B.K. 1969.** "Chromosome numbers of some grasses of Dehra Dun". *Bull. Bot. Surv. India* 11(3&4): 443–444.

Abstract: This paper records the chromosome number and their behaviour at meiosis of six species of grasses viz., *Apluda mutica* Linn., *Brachiaria ramosa* (Linn.) Stapf, *Chrysopogon serrulatus* Trin., *Cymbopogon distans* (Nees) Wats., *Setaria viridis* Linn. and *Chloris dolichostachya* Lag. from Dehra Dun.

930. **Saxena, D.K., Singh, S. & Srivastava, K. 2008.** "Taxonomy of *Rhodobryum* from Kumaon and Garhwal region of Uttarakhand, India". *Indian J. Forest.* 31(3): 437–440.

Abstract: The present study id focused on the distribution and taxonomy of beautiful rose moss *Rhodobryum roseum* (Hedw.) Limpr. and *Rhodobryum giganteum* (Schwaegr.) Par. from Kumaon and Garhwal hills respectively. These species of moss *Rhodobryum* grows in the form of green rosette patches on soil of usually reasonable nutrient rich status. The moss species remains green in summer but devoid of moisture. It is also observed that seasonal environmental factors do not much influence distribution of *R. roseum* however *R. giganteum* found sensitive as evident by change in colour and its restricted distribution.

931. **Saxena, H.O. 1966a.** "Artificial key to the angiosperous families of Mussoorie plants". *Indian Forester* 92(6): 391–405.

Abstract: The present key is aimed for use in the identificatrion of plants from Mussoorie and adjoining hills of corresponding range of altitude. This key is intended to be worked by the use of characteristic external morphological features which are easier to comprehend.

932. **Saxena, H.O. 1966b.** "Correct name of *Aechmanthera tomentosa* Nees (Acanthaceae)". *Indian Forester* 92(8): 529.

933. **Saxena, H.O. & Srivastava, P.B.L. 1973.** "Forest Communities of Mussoorie". *Trop. Ecol.* 14: 197–218.

934. **Schmidt, E. 1931.** "Contribution to the knowledge of flora and vegetation in the Central Himalaya". *J. Indian Bot. Soc.* 17: 269–278.

935. **Seema, Soni, P., Negi, M., Kamboj, S.K. & Rana, B.B. 2010.** "Floristic inventory of woody plants in fresh water wetland of Doon Valey, Uttarakhand, India". *Nature & Sci.* 8(11): 75–81.

Abstract: In order to study the floristic diversity of woody plants in fresh water wetland of Doon Valley of Uttarakhand, India, four transect lines were set along moisture gradients using belt transect method. Floristic inventory and plant community was evaluated using standard techniques. Diameter at breast height (dbh) for all woody plants (>1 cm dbh) was recorded at 1.3 m height. A total of 738 wood y plants belonging to 28 families, 46 genera and 51 species were recorded. Species diversity as calculated using Shannon-Wiener diversity index was 2.82 for trees and 3.52 for shrub and basal area was 441.2 m^2 ha^{-1} for trees and 5.601 m^2 ha^{-1} for shrubs. The most abundant species was *Trewia nudiflora* Linn. (Euphorbiaceae), which accounted for 37% of the total sampled stems. *Albizia lebbeck* Benth. had the highest basal area with (313.23 m^2 ha^{-1}). Moraceae was the dominant family accounting for 7% of the stems.

936. **Seidenfaden G. & Arora, C.M. 1982.** "An enumeration of the orchids of North Western Himalaya". *Nordic J. Bot.* 2: 7–27.

Abstract: An alphabetic enumeration of the species of orchids recorded from Northwestern Himalaya is supplied. While the classical work by Duthie listed a number of about 173 species, later finds bring this number up to about 250 species of which 24 are here recorded for the first time. This includes two proposed new species *Eria occidentals* Seid. and *Flickingeria hesperis* Seid. An attempt has been made to bring the nomenclature in accordance with modern concepts and rules, one new

combination, *Aorchis roborovskii* (Maxim.) Seid., is proposed. A plea is made for the establishment of strictly guarded reservations in order to conserve the remains of the fast dwindling orchid flora.

937. **Semwal, D.P., Bahuguna, Y.M. & Uniyal, P.L. 2010.** Dynamics of vegetation pattern in Garhwal Himalaya, Uttarakhand: Conservation needs. In: Uniyal, P.L., Chamola, B.P. & Semwal, D.P. (Eds.), *The Plant Wealth of Uttarakhand*. Jagadambica Publishing Co., New Delhi. Pp. 339–352.

938. **Semwal, D.P., Uniyal, P.L. & Bhatt, A.B. 2010.** "Structure, composition and dominance -diversity relations in three forest types of a part of Kedarnath Wildlife Sanctuary, Central Himalaya". *Notulae Scientia Biologicae* 2(3): 128–132.

939. **Semwal, J.K. 1984.** "Flowering plants around the holy shrine of Kedarnath, Uttar Pradesh". *J. Bombay Nat. Hist. Soc.* 81(1): 71–85.

Abstract: This paper gives an account of the angiospermic flora of Kedarnath, which is an alpine zone in Garhwal Himalaya. A list of 262 species of flowering plants represented by 149 genera and 52 families is given from 3200-3800 m altitude a.s.l. The dominant families of the area are: Ranunculaceae, Brassicaceae, Caryophyllaceae, Rosaceae, Apiaceae, Asteraceae, Ericaceae, Primulaceae, Scrophulariaceae, Lamiaceae, Polygonaceae, Orchidaceae, Liliaceae and Poaceae.

940. **Semwal, J.K. & Gaur, R.D. 1981.** "Alpine flora of Tungnath in Garhwal Himalaya". *J. Bombay Nat. Hist. Soc.* 78(3): 498–510.

Abstract: The present communication is an account of angiosperms collected from an alpine area (Tungnath) in Garhwal Himalaya during the years 1977-1978. Tungnath is one of the most important peaks situated in front of the famous Chaukhamba and Kedarnath peaks. The dominant families of this zone are Ranunculaceae, Fumariaceae, Caryophyllaceae, Rosaceae, Saxifragaceae, Apiaceae, Asteraceae, Gentianaceae, Scrophulariaceae, Polygonaceae, Orchidaceae, Liliaceae and Poaceae. A total number of 280 species and 157 genera represented by 50 families have been recorded.

941. **Semwal, J.K. & Gaur, R.D. 1986.** "Additions to the flora of Tungnath in Garhwal Himalaya". *J. Bombay Nat. Hist. Soc.* 83(1) 267–271.

Abstract: In the present paper 53 species of angiosperms have been an addition to the flora of Tungnath.

942. **Semwal, J.K., Gaur, R.D. & Purohit, A.N. 1981.** "Floristic pattern of Tungnath, an alpine zone of Garhwal Himalaya". *Acta Bot. Ind.* 9: 110–114.

943. **Semwal, S., Nautiyal, B.P. & Bhatt, A.B. 2008.** "Dominance diversity patterns and regeneration status of moist temperate forests in Garhwal, part of the North-west Himalayas, India". *Taiwan J. Forest Sci.* 23(4): 351–364.

Abstract: The structure, composition, diversity, and regeneration status of different forest types in a moist temperate region of Garhwal, India were Results revealed that overall diversity increased in Pinus-dominated sites which were characterized by more-open canopies (canopy cover < 20%) with scattered trees interspersed with young trees, shrub and herb species compared to Quercus forests with a dense crown cover (> 65%). A direct proportional relationship between tree cover and the diversity of sub-stratum vegetation was found; with increasing tree canopy cover, the diversity of shrubs and herbs significantly decreased ($r2 = 0.72$ and 0.83 for herbs and shrubs respectively at $p < 0.05$). Tree density was maximum in mixed broadleaf-coniferous forests while it declined in oak- dominated forests although vegetation cover was highest in mixed oak-forests. In *Pinus* forests, with the exception of species this genus others had poor or no regeneration. In general, *Pinus roxburghii* and *Quercus leucotrichophora* showed fair regeneration in spite of fire and logging. Tree density showed strong correlations with the densities of seedlings and poles, while sapling density was not significantly correlated that of trees, indicating low sapling density. Observations suggest that conversion of saplings to tree strata is a crucial factor to ensure good regeneration of species in these types of forests.

944. **Sen, D.N. 1959.** "Ecological studies on aquatic and swampy vegetation of Gorakhpur". *Agra Univ. J. Res.* (Sci.) 8: 1–14.

945. **Sethi, P., Rao, B., Mohan, D.D., Mahapatra, K.K., Upadyay, S., Haneef, F. & Khalid, M.A. 2002.** *Strategies and Action Plan for Biodiversity Conservation in Uttaranchal.* Report, TERI, New Delhi.

946. **Shah, N.C. 1974.** "A botanical survey in Nanda Devi Sanctuary". *Himalayan J.* 35: 210–214.

947. **Shankar, R. & Khare, P.K. 1985.** "Phytochemical studies of *Ampelopteris prolifera* (Retz.) Copel. and *Diplazium esculentum* Swartz". *J. Econ. Taxon. Bot.* 6(2): 499–502.

Abstract: Phytochemical characters of *Ampelopteris prolifera* (Retz.) Copel. and *Diplazium esculentum* Swartz which are used as vegetables by local persons in the hills of tehri in U.P. and Pachmarhi in central India, have been studied. Chemical analysis of dried powder of whole plant in both the species showed presence of sugar, protein, steroids, triterpenoids, flavones and flavonoids in the extract of different grades of organic solvents. Quantitative values of sugar, proteins, fatty substances phenols, ash and moisture have also been estimated and their significance is discussed.

948. **Sharma, A.K. & Dhakre, J.S. 1990.** "Rare flowering plants of Agra district". *J. Econ. Taxon. Bot.* 14(1): 232–234.

Abstract: Due to rapid urbanization, industrialization and biotic interference, flowering plants are being indiscriminately exploited and some of them are found to be of rare occurrence. A list of such species along with suggestions for protective measures are given.

949. **Sharma, A.K. & Dhakre, J.S. 1995.** *Flora of Agra district.* Botanical Survey of India, Calcutta. Pp. 356.

950. **Sharma, B.D. & Pandey, D.S. 1984.** *Exotic flora of Allahabad district.* Botanical Survey of India, Howrah. Pp. 157.

951. **Sharma, C.M. & Gaur, R.D. 1987.** "Palynotaxonomy of Himalayan blue poppy *Meconopsis aculeata* Royle". *Curr. Sci.* 56: 561.

952. **Sharma, C.M. & Kumar, A. 1992.** "Community structure of some natural forest stands in Lansdowne Forest Range in Garhwal Himalaya". *J. Trop. Forest Sci.* 5(1): 8–12.

Abstract: Three major forest types of the Lansdowne range were studied, namely Pure Pine, Pure Oak and Mixed Forests to analyse the community structure and their

environment. The pH of the soil ranged from 5.7 to 5.0. The major forest types are of *Pinus roxburghii, Quercus leucotrichophora* (as pre stands) and mixed forests of other species like *Rhododendron arboretum, Myrica nagi, Nycatanthes arbour-tristis, Prunus cerasoides* etc. Their association depends upon the altitude, aspect and other growth conditions.

953. **Sharma, C.M. & Rawat, R.S. 1993.** "Geophytological studies in relation to metamorphic rocks in Chakisain area (Pauri Garhwal)". *Indian J. Forest.* 16(3): 260–262.

Abstract: The present study is an attempt to analyse the relationship between earthcrust and plant communities growing veins, cracks and joints. The geological texture shows that the studied area from Chipalghat to Chakisain is represented by metamorphic rocks in which schist and quartizite are dominating types. While studying the plants growing on veins, cracks, joint and layering of weathered rocks, it has been observed that merely six species have been found dominating on the rocks, viz., *Polygonum capitatum, Rumex hastatus, Oplismenus undulatifolius, Micromeria biflora, Leucas lanata* and *Aleuritoptris albomarginata.*

954. **Sharma, C.M., Khanduri, V.P. & Goswami, S. 2001.** "Community composition and population structure in temperate mixed broad-leaved and conifer forest along an altitudinal gradient in a part of Garhwal Himalaya". *J. Hill Res.* 14: 32–43.

955. **Sharma, C.M., Butola, D.S., Ghildiyal, S.K. & Gairola, S. 2013.** "Phytodiversity along an altitudinal gradient in Dudhatoli forest of Garhwal Himalaya, Uttarakhand, India". *Int. J. Med. Aromat. Pl.* 3(4): 439–451.

Abstract: The present study was undertaken to enumerate the diversity of higher plants (Angiosperms and Gymnosperms) including important medicinal plants in biodiversity rich moist temperate Dudhatoli forest of Garhwal Himalaya, Uttarakhand, India. We have recorded a total of 268 plant species belonging to 182 genera and 69 families. Of these, Gymnosperms were represented by 6 species, 6 genera and 3 families only. Dicotyledons were represented by 243 species, 160 genera and 60 families, whereas monocotyledons by 19 species, 16 genera and 6 families. In the study area 226 species had common occurrence, whereas rest 42 species were uncommon. A total of 20, 7, 159, 53 and 29 species of climbers, grasses, herbs, shrubs and trees respectively were recorded from the study area.

956. **Sharma, C.M., Gairola, S., Ghildiyal, S.K. & Suyal, S. 2009.** "Forest dependent livelihood in relation to socio-economic status of the people in temperate villages of Garhwal Himalaya: A case study". *Mount. Res. & Develop.* 29(4): 308–319.

957. **Sharma, C.M., Ghildiyal, S.K., Gairola, S. & Suyal, S. 2009.** "Vegetation structure, composition and diversity in relation to the soil characteristics of temperate mixed broad-leaved forest along an altitudinal gradient in Garhwal Himalaya". *Indian J. Sci. & Technol.* 2(7): 39–45.

Abstract: The focus of the study is to characterize the structure, composition and diversity of Banj Oak (*Quercus leucotrichophora*) forests at different altitudes and slopes in Mandal-Chopta area of Garhwal Himalaya. Competing co-dominant tree

layers comprised of Persea duthiei and D. himalense at the higher altitude (2100m a.s.l.) and steeper slope (45°); D. himalense and Betula alnoides at the middle altitude (1700m a.s.l.) and moderate slope (38°); and Lyonia ovalifolia and Myrica esculenta at lower altitude (1550m a.s.l.) and gentles slope (30°) were observed in these forests. Community diversity was highest (3.140) at the higher altitude (site-1) whereas the concentration of dominance followed the opposite trend of the diversity. Physico-chemical properties of soils have revealed that availability of higher average total nitrogen and moisture contents might have given birth to higher total basal cover values at middle altitude. The tree density was positively correlated with the tree diversity and tree richness ($P< 0.001$). The vegetational parameters A/F ratio, Shanon-wiener index, Species richness, Margalef index and soil parameters especially pH and available phosphate (kg/ha) were significant ($P<0.05\%$) among the forest sites.

958. **Sharma, C.M., Suyal, S., Gairola, S. & Ghildyal, S.K. 2009.** "Species richness and diversity along an altitudinal gradient in moist temperate forest of Garhwal Himalaya". *J. American Sci.* 5(5): 119–128.

Abstract: In the present study we have described the impact of altitude on the species richness, species diversity and dispersion behaviour of different tree species in Himalayan temperate forest. We have observed that the values of all the growth indices i.e., Margalef's index (0.17 to 1.14), Menheink's index (0.27 to 0.80), Species diversity (0.99 to 2.34) and Simpson's diversity index (1.49 to 8.73) were maximum at the lower altitudes (2250-1850m asl), medium at mid-altitudes (2600-2400m asl) and lowest at the higher altitudes (2800-2700m asl). Significantly negative correlation of density and species richness with altitude and slope was recorded. The study suggests that the distribution and species richness pattern of different tree species are largely regulated by the altitude and climatic factors.

959. **Sharma, C.M., Baduni, N.P., Gairola, S., Ghildiyal, S.K. & Suyal, S. 2010.** "Tree diversity and carbon stocks of some major forest types of Garhwal Himalaya, India". *Forest Ecol. & Manage.* 260(12): 2170–2179.

Abstract: Four forest stands each of twenty major forest types in sub-tropical to temperate zones (350 m asl–3100 m asl) of Garhwal Himalaya were studied. The aim of the study was to assess the stem density, tree diversity, biomass and carbon stocks in these forests and make recommendations for forest management based on priorities for biodiversity protection and carbon sequestration. Stem density ranged between 295 and 850 N ha^{-1}, while total biomass ranged from 129 to 533 Mg ha^{-1}. Total carbon storage ranged between 59 and 245 Mg ha^{-1}. The range of Shannon–Wiener diversity index was between 0.28 and 1.75. Most of the conifer-dominated forest types had higher carbon storage than broadleaf-dominated forest types. Protecting conifer-dominated stands, especially those dominated by *Abies pindrow* and *Cedrus deodara*, would have the largest impact, per unit area, on reducing carbon emissions from deforestation.

960. **Sharma, C.M., Butola, D.S., Gairola, S., Ghildiyal, S.K. & Suyal, S. 2011.** "Forest utilization pattern in relation to socioeconomic status of people in Dudhatoli area of Garhwal Himalaya". *Forest Trees and Livelihood* 20(4): 249–264.

Abstract: Over the past few decades, the Himalaya has experienced unprecedented land use changes driven by rapid population growth and intensified human activities. Pressure on forests and their products has dramatically increased. Understanding forest products consumption is thus fundamental for assessing human-environment interactions and designing effective conservation policies in the Himalaya. This case-study focused on the relationship between the socio-economic status of the inhabitants, the forest utilization pattern and the anthropogenic pressures on the forest in the Dudhatoli area of Garhwal Himalaya, between 1750 m and 2200 m asl. Agricultural production and labour employment were the main occupation of the villagers in the study area. Approximately 82% (35,48 Quintals/annum/household) of total fuel wood and 78% (39,81 Quintals/ annum/ household) of the total consumed fodder was extracted from the forest, Dudhatoli forest is thus facing tremendous anthropogenic pressure. A total of 22 forest tree species were recorded to be used for a variety of purposes by the villagers. Anthropogenic pressure was highest in the forests close to the villages, and *Quercus* species were the most affected. Tree species richness and canopy cover was higher whereas stem density was lower in the undisturbed forests than in forests near the villages.

961. **Sharma, C.M., Gairola, S., Baduni, N.P., Ghildiyal, S.K. & Suyal, S. 2011.** "Variation in carbon stocks on different slope aspects in seven major forest types of temperate region of Garhwal Himalaya, India". *J. Biosci.* 36(4): 701–708.

Abstract: The present study was undertaken in seven major forest types of temperate zone (1500 m a.s.l. to 3100 m a.s.l.) of Garhwal Himalaya to understand the effect of slope aspects on carbon (C) density and make recommendations for forest management based on priorities for C conservation/sequestration. We assessed soil organic carbon (SOC) density, tree density, biomass and soil organic carbon (SOC) on four aspects, viz. north/east (NE), north/west (NW), south-east (SE) and south-west (SW), in forest stands dominated by *Abies pindrow, Cedrus deodara, Pinus roxburghii, Cupressus torulosa, Quercus floribunda, Quercus semecarpifolia* and *Quercus leucotrichophora*. TCD ranged between 77.3 CMg ha^{-1} on SE aspect (*Quercus leucotrichophora* forest) and 291.6 CMg ha^{-1} on NE aspect (moist *Cedrus deodara* forest). SOC varied between 40.3 CMg ha^{-1} on SW aspect (Himalayan *Pinus roxburghii* forest) and 177.5 CMg ha^{-1} on NE aspect (moist *Cedrus deodara* forest). Total C density (SOC+TCD) ranged between 118.1 CMg ha^{-1} on SW aspect (Himalayan *Pinus roxburghii* forest) and 469.1 CMg ha{ 1 on NE aspect (moist *Cedrus deodara* forest). SOC and TCD were significantly higher on northern aspects as compared with southern aspects. It is recommended that for C sequestration, the plantation silviculture be exercised on northern aspects, and for C conservation purposes, mature forest stands growing on northern aspects be given priority.

962. **Sharma, C.M., Gairola, S., Kumar, M., Rawat, Y.S. & Bagwari, H.K. 2009.** "Resource utilization in village ecosystem of temperate zone of Garhwal Himalaya". *Indian J. Agroforest.* 11(2): 94–100.

Abstract: The present study was conducted in Rudraprayag and Tehri districts of Garhwal Himalaya on five mid altitudinal villages to study the utilization of resources

by the inhabitants and their effect on the village ecosystem. The investigation has revealed that the average fuel wood and fodder consumption in these villages was 2636 Qt/yr/village and 6736.6 kg/day/village, respectively. The maximum production of wheat (1506 kg/ha), mustard (260 kg/ha) and pulses (598 kg/ha) was observed for village Dhaulana, whereas maximum production of paddy (1375 kg/ha) for village Karokhi, barley (782 kg/ha) for village Chunnikhal and finger millet (1478 kg/ha) and barnyard millet (1028 kg/ha) for village Bhanigram. The rate of exploitation of forest resources was verified by vegetation analysis, where no regeneration has been recorded from all the adjacent forests close to agricultural fields of the selected village. The total basal cover of the agroforestry tree species was higher (19.60 m^2/ha) at village Dhaulana and lowest (7.225m^2/ha) at village Chunnikhal.

963. **Sharma, J.P. & Dhakre, J.S. 1993.** Aquatic angiosperms of Shahjahanpur district, Uttar Pradesh. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.,* Addl. Ser.] Bishen Singh Mahendra Pal Singh, Dehradun. 4: 223–233.

Abstract: One hundred twenty six species belonging to 88 genera and 48 species of aquatic angiosperms have been reported from Shahjahanpur district, Uttar Pradesh. Out of 126 species, 72 are dicots and 54 are monocots. The dominant families are Cyperaceae (21 species), Poaceae (13 species), Asteraceae (8 species), Scrophulariaceae (8 species) and Polygonaceae (6 species).

964. **Sharma, J.P. & Murti, S.K. 1990.** "Contribution to the flora of Bijnor district, U.P." *J. Econ. Taxon. Bot.* 14(2): 341–371.

Abstract: The paper deals with the enumeration of flowering plants of Bijnor district, U.P. The study is based on the plant collection tours undertaken during the years 1958-1979 and includes the account of 241 species belonging to 254 genera under 83 families of angiosperms. A brief account of the location, topography, climate and vegetational types of the district is also provided.

965. **Sharma, J.R., Singh, S. & Uniyal, B.P. 2005.** "Plant diversity in Siwalik Himalaya". *Indian J. Forest.* 28(3): 321–337.

Abstract: In the present communication, an attempt has been made to put together an analytical compilation of the existing data and the information collected by the authors during plant surveys and explorations of Shiwalik Himalaya. 1020 species under 616 genera belonging to 146 families of vascular plants has been reported from this area.

966. **Sharma, M.P. 1996.** "Distribution and uses of some important dendrological components of Garhwal-Kumaon Himalaya". *J. Econ. Taxon. Bot.,* Addl. Ser. 12: 102–107.

Abstract: The present communication gives an account of altitudinal distribution and uses of some tree species found in Garhwal-Kumaon Himalaya. The families, genera and species are enumerated alphabetically, without any basionym or synonym(s). Local names, where available, are appended after the species.

967. **Sharma, M.P. & Gaur, R.D. 1982.** "Weed flora of Pokhari Block, Garhwal Himalaya". *Bull. Pure Appl. Sci.* 1: 23–30.

968. **Sharma, M.P. & Gaur, R.D. 1983-1984.** "A contribution to the flora of Pokhari Block (Chamoli Garhwal), Western Himalayas". *Indian J. Forest.* 6(2): 149–157; 7(1): 57–62 & 7(4): 323–327.

Abstract: The paper enumerates 538 species and 376 genera belonging to 107 families collected from Pokhari block in Garhwal Himalayas. A brief note on habit, colour of flowers and flowering seasons has been given. The dominant families with large number of genera and species are Ranunculaceae, Papilionaceae, Asteraceae, Scrophulariaceae, Lamiaceae, Orchidaceae and Poaceae.

969. **Sharma, M.P. & Gaur, R.D. 1985.** "A contribution to the flora of Pokhari Block, Chamoli (Garhwal), Western Himalayas". *Indian J. Forest.* 6(2): 149–157; 7(1): 57–62 & 7(4): 323–327.

Abstract: The paper enumerates 127 species belonging to 31 families collected from Pokhari block in Garhwal Himalayas. A brief note on habit, colour of flowers and flowering seasons has been given.

970. **Sharma, P.C. 1964.** "A note on the flora of Lucknow district". *Bull. Bot. Surv. India* 6(1): 101.

Abstract: Thirteen species has been reported for the first time for the flora of Lucknow district.

971. **Sharma, S. & Roy, P.S. 2007.** "Forest fragmentation in the Himalaya: A Central Himalayan case study". *Int. J. Sustain. Develop. & World Ecol.* 14: 201–210.

Abstract: Administrative divisions in the Great Southern Watershed of the Himalaya are diverse in terms of population density and forest cover. This study analyzed the spatial patterns of different attributes in the different Indian states and Himalayan kingdoms, and explored the extent and patterns of forest fragmentation in a Himalayan landscape as a case study. Of the total landscape in the case study area (3167 km^2), 41% was fragmented. Homogenous landscape (59%) includes either continuous natural vegetation or a village landscape. Presence of two forest patches (38% of the total fragmented area) at a unit scale of about 0.5 km^2 (525 × 525 m) was the most commonly occurring pattern but, in some parts, up to 13 patches were observed. Fragmentation of vegetation was visible even at smaller scales of landscape analysis. At a scale of 75 × 75 m, land division into three patches was observed. With an increase in the unit area of landscape analysis the number of patches per unit land area and the total fragmented area also increased. The forests that escaped fragmentation were either inaccessible to humans or had rigorous legal protection. Anthropogenic activities appeared to be one of the factors responsible for fragmentation but, natural factors also contributed.

972. **Sharma, S.C. 1990.** "Floristic elements in the vegetation of Shahjahanpur district, Uttar Pradesh". *J. Econ. Taxon. Bot.* 14(1): 163–170.

Abstract: Shahjahanpur district lies in bthe terai region of Upper gangetic Plain and coprises four types of forests viz., Sal forest, mixed forest, hydrophytes and grasslands. On the basis of the phytogeographical analysis of the vegetation twelve floristic elements have been observed. The Indo-Malayan element (21.6%) is dominant which is followed by Pantropical element (18.7%). The Indian element occurs fairly well

showing 14.6% representation in the flora. In view of its geographical position the district has a characteristic presence of *Citrullus colycynthis* (Linn.) Schrad, *Convolvulus microphyllus* Sieb. ex Spreng and *Zizyphus nummularia* (Burm.f.) Wight & Arn., as these represent Saharo-Sindian element and *Acacia nilotica* (Linn.) Del. Ssp. *Indica* (Benth.) Brenan., *Cappris sepiaria* Linn., *Desmostachya bipinnata* (Linn.) Stapf and *Pluchea lanceolata* Cl. as they belong o Sudano-Rajasthanian element.

973. **Sharma, S.C. & Dhakre, J.S. 1993.** "Life form classification and biological spectrum of the flora of Shahjahanpur district, Uttar Pradesh (India". *Indian J. Forest.* 16(4): 366–371.

Abstract: Ten life forms represented in the vegetation of Shahjahanpur district. They are mesophanerophytes (9.4%), nanophanerophytes (19.4%), chamaephytes (3.6%), hemicryptophytes (1.7%), geophytes (6.5%), hydrophytes (5.6%), therophytes (50.4%), lianas (2.9%), parasites (0.3%) and epiphytes (0.2%). Biological spectrum of the area is Theronano-phanerophytic. The dominance of therophytes appears due to grazing pressure. A steady rise in the number of therophytes with corresponding decrease in phanerophytes has been observed from the protected sal forest to the disturbed grasslands. Biological spectra of Shahjahanpur and other localities of Upper Gangetic Plain have been compared with Raunkiaer's normal spectrum.

974. **Sharma, S.C., Malik, S.A. & Sharma, A. 2007.** "The exotic plants in the vegetation of Shahjahnpur district (U.P.)". *J. Econ. Taxon. Bot.* 31(1): 235–243.

Abstract: Shahjahanpur district lies in the Terai region of Upper Gangetic plain. The vegetation comprises several plants that belongs to different native countries. On the basis of analysis of vegetation, 178 exotic species, belonging to 148 genera and 62 families, have been reported from the district. They are either cultivated or have naturalised in the district. Gymnosperms and monocots are represented by 4 and 10 species respectively. *Clerodendrum aculeatum* Griseb., *Parthenium hysterophorus* L. and *Solvia anthemifolia* (Juss.) R. Br. ex Less. are the recent entrants.

975. **Shukla, B.K. 2012.** *A report on the floristic diversity of Chambal Wildlife Sanctuary, Uttar Pradesh,* Botanical Survey of India, Kolkata.

976. **Shukla, B.K. & Roy, G.P. 2004.** "Floristic composition of Singrauli coal mines area". *Bull. Bot. Surv. India* 46(1-4): 226–245.

Abstract: Singrauli is situated on southern corner between Uttar Pradesh and Madhya Pradesh. It falls under the district Sonbhadra of Uttar Pradesh and Sidhi of Madhya Pradesh. The entire mining area is represented by dry deciduous forests, degraded forests with dominant species of *Madhuca longifolia* var. *latifolia* (Roxb.) Chevalier. About 180 species belonging to 145 genera and 59 families have been collected from the coal mines area. The paper deals with the systematic enumeration of all species coolected from the area along with ecological notes. Pollution aspects and conservation measures have been discussed.

977. **Shukla, B.K. & Singh, K.P. 2007.** "Diversity and conservation of grasses in Uttar Pradesh". *Range Manage., Agroforestry* 28(2): 267–270.

978. **Shukla, B.K. & Sinha, B.K. 2004.** "Grasses of Bundelkhand (Uttar Pradesh)– Taxonomic studies". *J. Non-Timber Forest Prod.* 11(4): 274–315.

Abstract: The present paper deals with the detailed taxonomic account of grasses of Bundelkhand with generic specific keys. Each species is appended with short description, ecological notes, flowering and fruiting periods and distribution data. A perusal of literature, field survey and herbarium consultation at BSA, BSD, DD and Duthie Herbarium revealed that family Poaceae in Bundelkhand is represented by 172 species under 84 genera. *Brachiaria brizantha* (Hochst. ex R. Rich.) Stapf is new to the flora of Upper Gangetic Plains.

979. **Shukla, G. & Verma, B.K. 1988.** "Studies in the sedges of Mirzapur district (U.P.)". *Indian J. Forest.* 11: 110–120.

980. **Siddiqui, M.B. 2004.** "Asteraceae in Hardoi district of Uttar Pradesh". *J. Econ. Taxon. Bot.* 28(4): 927–934.

Abstract: The paper lists 38 genera and 48 species of Asteraceae occurring in Hardoi district of Uttar Pradesh. It deals with the correct nomenclature along with vernacular/ local names, habit, flowering and fruiting times of each taxa.

981. **Sikarwar, R.L.S. 2009.** "A list of trees of Botanic Garden (NBRI), Lucknow". *J. Econ. Taxon. Bot.* 33(2): 376–384.

Abstract: The National Botanical research Institute (NBRI), Lucknow is one of the premier botanical laboratories of India under the Council of Scientific & Industrial Research (CSIR), New Delhi. The NBRI has a Botanic Garden which is well known all over the world. It is the third largest and one of the oldest Botanic Garden in India, sread in an area of 25 hactares, located in the heart of Lucknow, the capital city of Uttar Pradesh along the southern bank of river Gomti. The garden has a rich collection of both indigenous and exotic plants totalling about 7000 species/cultivars, representing 210 families. The author prepared an inventory of 324 tree species under 56 families growing in Botanic Garden, which is given I the present communication.

982. **Silas, R.A. 1987.** *Taxonomic Studies of Plant Communities in Dudhatoli Region, Pauri Garhwal.* Ph. D. Thesis, H.N.B. Garhwal University, Srinagar. (unpublished).

983. **Silas, R.A. & Bisht, M.S. 1991.** "Vegetation and wildlife in Dudhatoli region, Garhwal Himalaya, Uttar Pradesh". *Indian J. Forest.* 14(1): 21–27.

984. **Silas, R.A. & Gaur, R.D. 1987.** Some important indigenous trees for social and agroforestry purposes with special reference to Garhwal Himalayan. In: Khosla, P.K. & Kohli, R.K. (Eds.), *Social Forestry for Rural Development.*

985. **Silas, R.A., Gaur, R.D. & Barthwal, P.S. 1987.** Forest resources of Rath area, Pauri Garhwal with special reference to resource management and conservation. In: Pangtey, Y.P.S. (Ed.), *Western Himalaya, Problem and Environmental Conservation.* Pp. 157–169.

986. **Silas, R.A., Negi, K.S. & Gaur, R.D. 1987.** "Preliminary analysis of Pine-Oak communities in Dudhatoli region Garhwal Himalaya". *J. Tree Sci.* 6: 113–118.

987. **Silori, C.S. 2001.** "Status and distribution of anthropogenic pressure in the buffer zone of Nanda Devi Biosphere in western Himalaya, India". *Biodiv. & Conserv.* 10: 1113–1130.

Abstract: Nanda Devi Biosphere Reserve (NDBR) (2236.74 km^2), extending over three civil districts viz, Chamoli, Pithoragarh and Almora of the state of Uttar Pradesh, is an important protected area of the western Himalaya owing to its rich biological and cultural diversity. The human (n = 1856) and livestock population (n = 7785) of 19 settlements in the buffer zone as well as seasonal grazing by 15 000–20 000 migratory sheep and goats were the major sources of anthropogenic pressure in the reserve. The intensity of wood-cutting and lopping of a total of 35 sampled woody species was assessed in the buffer zone as parameters of anthropogenic pressure. Anthropogenic pressure showed restricted distribution due to the sparse location of human settlements and seasonal use of biomass resources by majority of the inhabitants, who live a trans-humane lifestyle. Intensive wood-cutting was limited to within 2 km radius of human settlements while tree lopping was mainly done by the migratory shepherds around timber-line (3600–3800 m). Of the total cut trees, the proportion of 20–60 cm girth class cut trees was recorded more. The regeneration percentage of tree species was higher in Chamoli and Pithoragarh sectors as compared to the Almora sector of the buffer zone. Fuelwood plantation in the degraded lands around villages through peoples participation, introduction of alternate fuel devices and employment opportunities have been suggested to minimize the dependence of local people on biomass resources and ensure the biodiversity conservation in the NDBR.

988. **Silori, C.S. 2004.** "Socio-economic ad ecological consequences of the ban on adventure tourism in Nanda Devi Biosphere Reserve, Western Himalaya". *Biodiv. & Conserv.* 13: 2237–2252.

Abstract: Prior to 1982, the uncontrolled mountaineering activities to the Nanda Devi peak led to theheavy destruction of the biological resources of the region in the form of poaching of wild animals, treefelling by expedition parties, collection of medicinal herbs and accumulation of garbage. To curb thebiotic interference, the area was declared as Nanda Devi National Park (NDNP) and adventure tourismwas stopped in 1982. Further in 1988, an area of 2236.74km2 was designated as Nanda Devi BiosphereReserve (NDBR) with an inner core zone (NDNP) surrounded by a buffer zone. A ban on tourismactivities, followed by the designation of NDBR directly helped in a significant improvement in forestcover and density. The better status of wild animals, including rare and endangered species such as muskdeer (Moschus chrysogaster) and blue sheep (Psuedois nayaur), is an indicator of such improvements.However, from a socio-economic point of view the loss of income from adventure tourism forced localpeople to migrate from the area, a phenomenon that was reflected in the human population trends, registering 15% decline between 1981 and 1991 and another 13% between 1991 and 1996. In theabsence of alternative income sources, marginal agriculture and animal husbandry became the majorsources of income for the locals. Nonetheless, the low density of human population kept the level ofbiotic pressure under control in NDBR. Promotion of eco-tourism and natural resource based employmentgeneration schemes are suggested to compensate for the economic loss to the local people and tomaintain the biodiversity of NDBR.

989. **Singh, A. 2010.** "Woody species composition of Banaras Hindu University, Varanasi, India". *J. Non-Timber Forest Prod.* 17(4): 453–472.

Abstract: The woody species composition of the main campus of Banaras Hindu University which spreads over an area of 1,300 acres, was analyzed. A total of 309 species were collected of which 299 are Angiosperms while the remaining 10 are that of Gymnosperms. Trees are the dominant constituents of the woody species composition of the Banaras Hindu University campus. The number of evergreen woody species exceeds the deciduous woody species. The Leguminosae, Apocynaceae and Euphorbiaceae are the dominant families of Angiospermic flora of the campus.

990. **Singh, A. 2011a.** "Exotic flora of the Banaras Hindu University main campus, India". *J. Ecol. & Nat. Environm.* 3(10): 337–343.

Abstract: The exotic flora of the main campus of Banaras Hindu University, India, spreading over 1,300 acres of land area, was analyzed. A total of 183 exotic plant species are reported from the university campus, represented by 149 genera and 58 families. The flora of American origin dominates the exotic floristic composition of the university. The Fabaceae, Asteraceae and Poaceae are the dominant families of the exotic flora of the Banaras Hindu University campus.

991. **Singh, A. 2011b.** "Natural vascular floristic composition of Banaras Hindu University, India: An overview". *Int. J. Peace & Develop. Stud.* 2(4): 119–131.

Abstract: The naturally occurring vascular flora of the main campus of Banaras Hindu University spreading over an area of 1,300 acres was analyzed. A total of 329 vascular plant species were reported in the campus of which only 5 were Pteridophytes and the remaining 324 species were Angiosperms. No natural occurrence of gymnosperms was reported from the University Campus. Angiosperms were represented by 76 families of which the Asteraceae, Poaceae and Fabaceae are the dominant families of the flora of Banaras Hindu University.

992. **Singh, A. 2011c.** "Observations on vascular wall flora of Banaras Hindu University Campus, India". *Bull. Environm. Pharmacol. & Life Sci.* 1(1): 33–39.

Abstract: A study was conducted to analyze the seasonal vascular wall floristic composition of the Banaras Hindu University Campus, India spreading over 1,300 acres of land area. A total of 119 vascular wall flora was recorded, of which only one species was represented by pteridophyte. No any species of Gymnosperm was observed as wall flora in the University Campus. The Angiospermic wall flora was represented by 111 genera belonging to 34 different families. The Asteraceae, Poaceae and Amaranthaceae were the dominant families of the wall flora of the Banaras Hindu Campus. Majority of the non-woody wall flora appear in rainy and winter seasons of the year. Among the woody perennials, *Ficus benghalensis, Ficus religiosa, Ficus glomerata* and *Ficus racemosa* were the most common wall flora of the Banaras Hindu University Campus.

993. **Singh, A. 2011d.** "Vascular flora on coal mine spoils of Singrauli coalfields, India". *J. Ecol. & Nat. Environm.* 3(9): 309–318.

Abstract: A field study was conducted to analyse the floristic composition of coal mine spoils of singrauli coalfields, India spreading over an area of about 2200 sq. km. A

total of 197 plant species were reported representing 45 families. Herbaceous flora dominates the floristic composition of coal mine spoils. The Poaceae, Fabaceae and asteraceae are the dominant families of the flora on coal mine spoils of Singrauli coal fields.

994. **Singh, A. 2012.** "Exotic flora of the Chandauli district, Uttar Pradesh, India: An overview". *Indian J. Forest.* 35(1): 79–84.

Abstract: A study was conducted to analyse the exotic flora of the Chandauli district of Eastern Uttar Pradesh. A total of 152 plant species distributed among 117 genera and 50 families were collected. The flora of American and African origin dominates the exotic floristic composition of the district.

995. **Singh, A. 2014a.** "Observations on the vascular wall flora of Varanasi City, India". *Int. J. Modern Biol. & Med.* 5(2): 40–55.

Abstract: The present study was to assess the vascular wall flora of the Varanasi city, India, located on the bank of sacred Ganges River. A total of 173 plant species were recorded from the walls of Varanasi city, of which 171 species were represented by angiosperms while only two species were represented by the pteridophytes. The angiosperms were represented by 131 genera distributed among 47 families. The Poaceae, Asteraceae and Amaranthaceae were the dominant families of the wall flora of Varanasi city. Analysis of flora with respect to life forms indicated the dominance of therophytes over the other life forms. The vascular wall flora of the city is dominated by the exotic species. *Lindenbergia indica, Ficus religiosa, Ficus benghalensis, Ficus infectoria, Pteris vittata* and *Tridax procumbens* were the most common flora visible on the walls of the Varanasi city.

996. **Singh, A. 2014b.** "Trees of *Terminalia arjuna* need protection on Banaras Hindu University main campus, India". *Sci. & Cult.* 80(1-2): 63–64.

997. **Singh, A. 2015a.** "Observations on the vascular flora of Banaras Hindu University main campus, India". *Int. J. Modern Biol. & Med.* 6(1): 48–87.

Abstract: A study was conducted to analyze the vascular flora of Banaras Hindu University main campus spreading over 1,350 acres of land area. The university campus comprises of 820 vascular plant species, of which 11 species of 7 genera belonging to 6 families are represented by the Pteridophytes, 18 species of 8 genera belonging to 5 families are represented by the Gymnosperms and 791 species of 502 genera belonging to 111 families are represented by the Angiosperms. The vascular flora of university campus is dominated by the Fabaceae, Asteraceae and Poaceae families. The exotic species dominate over the native species and the species of perennial duration dominate over the species of annual and biennial durations in the flora of Banaras Hindu University main campus.

998. **Singh, A. 2015b.** "Observations on the woody wall flora of Varanasi City, India". *Int. J. Scientif. Res. Sci. & Technol.* 1(4): 192–196.

Abstract: An observational study was conducted to explore the woody wall flora of the world's oldest city of Varanasi, India located at the bank of sacred Ganges River. Forty one woody plants of 35 genera belonging to 18 families were recorded on the walls of the city represented exclusively by the dicotyledonous angiospermic

group of plants. Fabaceae, Moraceae and Apocynaceae were the dominant families of the woody wall flora of Varanasi city. Native woody species were greater in number compared to exotic woody species on the walls of Varanasi city.

999. **Singh, A. 2015c.** "Woody plant diversity of Banaras Hindu University Main Campus, India". *Int. J. Res. Agric. & Forest.* 2(8): 25–35.

Abstract: A study was conducted to explore the woody species diversity of Banaras Hindu University main campus spreading over 1,350 acres of land area. A total of 330 species of woody plants were recorded from the university campus of which 312 woody species belonging to 184 genera and 55 families were represented by the Angiosperms while 18 woody species belonging to 8 genera and 5 families were represented by the Gymnosperms. The Fabaceae, Euphorbiaceous and Apocynaceae were the dominant families of the woody species composition of university campus. The exotic woody species were greater in number compared to native woody species on the Banaras Hindu University main campus.

1000. **Singh, A. 2016.** "Exploration of woody wall flora on the Banaras Hindu University Main Campus, India". *Int. J. Res. Agric. & Forest.* 3(3): 26–30.

Abstract: An observational study was conducted to explore the woody wall flora of urbanized and about a century old Banaras Hindu University main campus, spreading over 1,350 acres of land area. Twenty three woody plants belonging to 17 genera and 12 families were recorded from the walls of the university campus represented exclusively by the dicotyledonous angiosperms. Moraceae, Apocynaceae and Fabaceae were the dominant families constituting more than half of the woody wall plants of the Banaras Hindu University main campus. The representation by native species was about three times greater than the non-native species on the walls of the university campus.

1001. **Singh, A. & Joshi, S.P. 2011.** "Woody plant diversity along Tons riverine ecosystem in Uttaranchal (India)". *Indian J. Forest.* 34(4): 427–432.

Abstract: The present paper incorporates the woody plant diversity along the Tons river forest ecosystem from Naitwar to Tiuni (42 km.). This study is restricted to 100 m from either side of the river. Tons riverine forest ecosystem supports 156 species, 122 genera and 62 families. The growth habit of the woody flora indicates high percentage of shrubs 50% followed by large trees 39%, woody climber 6% and small trees 5%. The study site indicates rich woody vegetation showing interconnectivity of high altitude and low altitude specific plant species.

1002. **Singh, A., Balodi, K.N., Naithani, S., Srivastava, A., Singh, A. & Kwon-Ndung, E.H. 2017.** "Vascular plant diversity with special reference to invasion of alien species on the Doon University Campus, Dehradun, India". *Int. J. Biodiv. & Conserv.* 9(3): 56–76.

Abstract: The present study was conducted to assess vascular plant diversity in a modified habitat in Shivalik region. Extensive surveys were conducted to document the species in each season and identification was done with the help of regional floras. A total of 191 species comprising 181 species of angiosperms (176 genera and 76 families), 2 species of pteridophytes (2 genera and 1 family), and 8 species

of gymnosperms (7 genera and 5 families) were observed. The dominant Angiosperms families include Asteraceae (18 genera and 18 species), followed by Fabaceae (16 genera and 18 species), Lamiaceae (8 genera and 9 species), Solanaceae (5 genera and 9 species), Amaranthaceae (7 genera and 8 species), Euphorbiaceae (4 genera and 8 species) and Apocynaceae (6 genera and 7 species). In Gymnosperms, 5 families were recorded which include family Pinaceae, Cycadaceae, Zamiaceae, Araucariaceae and Cupressaceae. In pteridophytes, only two species of the family Pteridaceae were recorded. The categorizations on the basis of species habit, 96 species were recorded as herbs, 23 shrubs, 48 trees, 14 climbers, 8 grasses and 2 species of ferns. On the basis of species economic importance, 111 species had medicinal value, 43 ornamental, 8 medicinal-edible, 8 fodder, 7 edible, 2 medicinalornamental, 2 edible-fodder, 1 medicinal-timber, 1 fuel-fodder, 1 fuel-timber-edible-ornamental, 1 medicinal-fiber, 1 medicinal-fuel-fodder-religious, 1 ornamental-fuel, 1 ornamental-religious, 1 condiment uses while rests of the 2 species have other uses. In terms of occurrence, 36.64% species were native, while 63.35% species were non-native. The study provides baseline information on a modified habitat in an important eco-region and would be helpful in monitoring the changes in future.

1003. **Singh, A., Singh, R.K., Kumar, N., Kumar, S., Upadhyay, A., Goswami, A. & Sharma, P.C. 2018.** "Genetic erosion of crop landraces: trends in the conservation of locally adapted 'Newar' radish in Jaunpur district, Uttar Pradesh, India". *Indian J. Tradit. Knowl.* 17(2): 344–352.

Abstract: A study was conducted to understand trends in the conservation of the locally adapted critically endangered radish landrace 'Newar ' (*Raphanus jaunpurensis* sp. nova.), conventionally grown in certain saline areas of Jaunpur city, Uttar Pradesh for use in salads, and for other traditional household uses, as well as the sale of fresh roots and seeds. An exploratory research design was adopted to collect data from 40 respondents, including 5 key informants. Specific agronomic characteristics of 'Newar' such as long roots that maintained organoleptic properties for an extended time, salt tolerance, compatibility for mixed cropping with hookah tobacco, varied traditional usage and generation of extra income from the seed crop played a critical role in sustaining 'Newar ' radish cultivation in the past. Nonetheless, conservation and trade of this variety have collapsed over the past two decades due to a range of factors, including rapid urbanization, changing consumer preferences, gradually vanishing hookah tobacco cultivation and disappearance of the seed network. Concerted policy and scientific efforts are urgently needed to revive the cultivation of this unique horticultural resource.

1004. **Singh, A.K. 1994.** "Compositae of Deoria district". *J. Econ. Taxon. Bot.* 18(2): 267–270.

Abstract: The paper deals with systematic enumeration of 54 species, belonging to 38 genera of family Compositae from Deoria district (U.P.). Correct binomial name, flowering and fruiting time is given along with each species.

1005. **Singh, A.K. 1995.** "Grasses of Deoria district (U.P.)". *J. Econ. Taxon. Bot.* 19(2): 261–268.

Abstract: Present paper deals with the grasses of district Deoria, U.P. A list of 51 genera and 66 species of grasses has been given in this manuscript. Correct botanical name, habit, habitat, phenology and field notes are given along with each species.

1006. **Singh, A.K. 1997**. "Seasonal aspect of the flora of Deoria". *J. Econ. Taxon. Bot.* 21(3): 694–696.

Abstract: The present paper gives an account of flowering and fruiting time of Flora of Deoria. The flowering recorded maximum during July-September and March-May, for herbaceous and woody plant species respectively.

1007. **Singh, A.K. 2006a.** "A contribution to the aquatic and wetland flora of Varanasi". *J. Econ. Taxon. Bot.* 30(1): 6–24.

Abstract: The present communication deals with with an enumeration of aquatic and wetland plants of Varanasi. Physiography and climate of the study area, observation of species habitat, local name, flowering and fruiting period, uses and ecological notes have been given. In all 181 species belonging to 116 genera and 50 families have been dealt with. The present work is intended to serve those who are concerned with the management and control of aquatic and wetland ecosystems. Agriculturists concerned with aquatic crop plants (i.e. *Oryza* and *Trapa*) or the maintenance of irrigated land will find this work of particular value for the identification of weeds.

1008. **Singh, A.K. 2006b.** "Flora of Deoria district– A checklist". *J. Econ. Taxon. Bot.* 30(1): 36–54.

Abstract: A comprehensive account of angiospermic plants of Deoria district has been presented as a first report in this paper. The plants were collected during 1982-1986. In all, 707 plant species (Dicots 542: Monocots 165) of angiosperms, belonging to 467 genera (Dicots 365: Monocots 102) and 124 families (Dicots 99: Monocots 25) have been listed. The ratio of species belonging to monocots and dicts is 1:3.28, of genera 1: 3.57 and of families 1: 3.96. The Asteraceae and Poaceae are the largest families in Dicots and monocots respectively. Up=to-date nomenclature has been provided. Basionyms and synonyms have been avoided for economy of space.

1009. **Singh, A.K. 2007.** *Sedges and Grasses of Eastern Uttar Pradesh*. Vol. I and II. Daya Publishing House, Delhi. Pp. 852.

1010. **Singh, A.K. 2010.** "Cyperaceous weeds of Varanasi district, Uttar Pradesh". *Indian J. Forest.* 33(1): 103–106.

Abstract: In the present paper 41 species of the family Cyperaceae belonging to 8 genera invading the cultivated fields of Varanasi district have been recorded. The study shows that 28 species occur in the paddy fields exclusively and 13 in association with Gram, Sugarcane, *Trapa*, Vegetables and Wheat crops. During the survey *Fimbistylis eragrostis* (Nees & Mey) Hance was recorded as a new record for Uttar Pradesh. Twenty three species have been recorded for the first time from Varanasi district.

1011. **Singh, A.K. 2014.** "Seedling morphology of *Sida acuta* Burm.f.– A medicinal weed". *J. Non-Timber Forest Prod.* 21(1): 81–84.

Abstract: In the present communication seedling morphology of *Sida acuta* Burm. f., a well known medicinal weed of tropics and subtropics has been highlighted. Seedlings have been observed for 24 days up to 5th leaf stage to record their morpho-taxonomic attributes and illustrated at different leaf stages. Seedling germination was *Macaranga type*. Paracotyledons were opposite, isocotylar, foliaceous, exstipulate, petiolate and persistent up to 7th leaf stage. Paracotyledon blade was deltoid-ovate, base rounded, apex obtuse, margins entire, both surface green and glabrous, venation acrodromous. First leaf single, simple, alternate, exstipulate and petiolate. Leaf petiole was green and pubescent, terete and channelled in cross section. Leaf blade was oval, base cuneate, apex acute, margins dentate, both surface sparsely hairy and venation cladodromous. Subsequent leaves same as that of first leaf but stipulate; stipules two, unequal in length.

1012. **Singh, S.K. & Sahu, R.K. 2012.** "Seedling morphology of some rainy season weeds of Varanasi district". *J. Econ. Taxon. Bot.* 36(1): 16–23.

Abstract: The juvenile morphology of some rainy season weeds, viz., *Desmodium triflorum, Gomphrena celosoides, Ipomoea pes-tigridis, Malvastrum coromandelianum, Parthenium hysterophorus, Phyllathus fraturnus, Trianthema portulacastrum* and *Xanthium indicum* are examined on the basis of materials from crop fields of Varanasi district, Uttar Pradesh, India. Full morphological description of 8 weed seedlings belonging to 8 different genera and 7 different families is provided with diagrams. The results of the present study seem to be useful in identification of weeds at their juvenile stage. Seedlings of 8 weeds can be distinguished from each other chiefly on the basis of collet (*Desmodium triflorum, Ipomoea pes-tigridis, Malvastrum coromandelianum, Parthenium hysterophorus, Phyllathus fraturnus* and *Xanthium indicum*); paracotyledon venation (*Ipomoea pes-tigridis, Parthenium hysterophorus* and *Phyllathus fraturnus*) and presence/absence of stipule (*Gomphrena celosoides, Parthenium hysterophorus, Phyllathus fraturnus* and *Trianthema portulacastrum*).

1013. **Singh, A.K. & Singh, S.K. 1991.** "Aquatic and semi-aquatic plants of Deoria district". *J. Econ. Taxon. Bot.* 15(2): 251–260.

Abstract: This contribution deals with 124 species, representing 78 genera, belonging to 39 families of aquatic and semi-aquatic angiosperms of eoria district. Geography, climate, habit, phenology and detailed distribution are also given.

1014. **Singh, A.K., Singh, A.K. & Sahu, R.K. 2015.** "Taxonomic studies on some common taxa of the tribe *Paniceae* (Poaceae) and their seedlings from Vindhyan region, Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 39(1): 98–120.

Abstract: The aim of the present study is to record taxonomic diversity of ten taxa of the tribe *Paniceae* (family Poaceae), belonging to ten different genera, collected from Vindhyan region of Uttar Pradesh with special emphasis of their seedlings. Morpho-taxonomic description of mature taxa and their seedlings along with artificial key and illustrations have been provided to facilitate easy identification and justification.

1015. **Singh, A.K., Singh, S. & Devi, Y. 2008.** "Morpho-taxonomic observations on seedlings of two coomon weeds– *Croton bonplandianus* Baill. and *Xanthium indicum* Koenig from Varanasi (Uttar Pradesh)". *J. Econ. Taxon. Bot.* 32(2): 311–315.

Abstract: The seedling morphology of two common weeds *Croton bonplandianus* Baill. and *Xanthium indicum* Koenig are observed for 31 and 45 days respectively upto 5th true leaf stage. The growth in height patterns are 9.6 cm in C. *bonplandianus* and 9.5 cm in *xanthium indicum*. S:R are also recorded.

1016. **Singh, A.K., Singh, S. & Sahu, R.K. 2011.** "Morpho-taxonomic studies on seeds and seedlings of six fibre yielding taxa from Varanasi district (U.P.), India". *J. Econ. Taxon. Bot.* 35(1): 158–167.

Abstract: The seed and seedling morphology of six fibre yielding taxa, viz., *Corchorus aestuans* L., *Crotalaria juncea* L., *C. retusa* L., *Hibiscus cannabinus* L., *H. micranthus* L.f. and *H. radiates* Cav. have been studied. Some characters of seeds and seedlings are found useful in distinguishing the taxa studied. This has been supported by the construction of an artificial key and illustrations.

1017. **Singh, A.K., Singh, P., Devi, Y. & Ansari, A.A. 2009.** "Grass weeds of cultivated fields in south eastern Uttar Pradesh". *J. Econ. Taxon. Bot.* 33(1): 81–101.

Abstract: The present communication deals with the grass weeds of cultivated fields of Maize, Pigeon Pea, Rice, Sugarcane, Vegetables and Wheat in south-eastern ttar Pradesh, based on the survey done during 2003-2006. A total number of 40 species of grasses belonging to 26 genera have been recorded. The species have been enumerated alphabetically with correct binomial followed by basionym, brief description, henology and distribution. Key to the genera and species are provided. Line drawing of spikelets for easy identification in field are also given. The study shows that 7 species occurin rice fields and 2 species each in wheat and vegetable fields excusively. The genera with decending number of species are *Digitaria* (Heist.) Haller (6 species), followed by *Eragrostis* Wolf and *Setaria* P. Beauv. (4 species each), *Brachiaria* Griseb. (3 species) and *Paanicum* (2 species). Twenty one genera are represented by single species each. Two taxa,, viz., *Brachiaria milliformis* (J. Presl ex C. Presl) A. Chase and *Diplachne fusca* (L.) Beauv. ex R.S. are new record for Uttar Pradesh; the latter is also a new generic record for Uttar Pradesh.

1018. **Singh, A.K., Singh, S., Srivastava, M. & Ansari, A.A. 2008.** "Morpho-taxonomic studies on seeds and seedlings of four narcotic plants of Varanasi district, Uttar Pradesh". *J. Econ. Taxon. Bot.* 32(4): 891–896.

Abstract: Morpho-taxonomic findings on seeds and seedlings of four well known narcotic plants, viz., *Cannabis sativa* L., *Datura metel* L., *Nicotiana rustica* L. and *Papaver somniferum* L. found in Varanasi district and adjoining areas are reported in the present paper. Some morpho-taxonomic attributes of seeds and seedlings have been found to be useful in distinguishing the taxa studied and are supported by artificial keys and illustrations.

1019. **Singh, A.K., Srivastava, M., Devi, Y. & Pandey, R.K. 2009.** "A contribution to the Compositae in South-Eastern Uttar Pradesh". *J. Econ. Taxon. Bot.* 33(1): 177–193.

Abstract: A floristic and systematic account of the family Compositae in South-Eastern Uttar Pradesh is presented here, covering the districts of Chandauli, Ghazipur, Jaunpur, Mirzapur and Varanasi. The plants were collected during 2003-2005. Up-to-date

nomenclature has been provided. In all, 68 species belonging to 45 genera have been enumerated alphabetically with author's citation, basionym, synosym, brief description, ecological and phonological notes, distribution and uses, if any. The largest genus was *Blumea* DC. (9 species), followed by *Spilanthes* Jacq. (4 species), *Erigeron* L., *Gnaphalium* L., *Pulicaria* Gaertn. and *Sonchus* L. (3 species each). *Ageratum* L., *Conyza* Less., *Launaea* Cass. and *Pentanema* Cass. have 2 species each. Thirty five genera are represented by single species. Three taxa *Spilanthes ciliata* Humb., *S. radicans* Jacq. and *S. uliginosa* Sw. are found s new record for the Upper Gangetic Plain.

1020. **Singh, A.K., Pandey, R.K., Singh, Priyanka, Singh, S. & Devi, Y. 2008.** "Distribution of Angiospermic macrophytes in water bodies of Varanasi district, Uttar Pradesh". *J. Econ. Taxon. Bot.* 32(2): 320–332.

Abstract: This contribution deals with the distribution of angiospermic macrophytes in 126 water bodies of Varanasi district. A total of 185 angiospermic macrophytes have been provided in tabulated form along with associated water bodies and their seasonality. Out of 185 species, 85 were dicotyledons and 100 monocotyledons. About 68% of monocots belong to the families Cyperaceae and Poaceae. The most dominant genus was *Cyperus* L. The rea, pH and transparency of 29 water bodies were also recorded.

1021. **Singh, A.P. & Kumari, B. 2018.** "A survey of tree flora of Rampur district of Rohilkhand region, (U.P.)". *J. Med. Pl. Stud.* 6(4): 169–174.

Abstract: A survey was conducted during the year 2017 for the investigation of multi-use of trees diversity in of Rampur district. The present study focuses on the need of multi-use tree species and their conservation for future generations. Total 93 tree species under 78 genera belonmging to 37 families have been recorded. Out of 37 families, Moraceae represented by 10 species followed by Caesalpiniaceae with 9 species and Apocynaceae & Mimosaceae with 6 species each. About 46 tree species exhibit deciduous nature, 33 species are evergreen, 9 species are semi-deciduous and 5 tree species are semi-evergreen in the study area. 93 species surveyed in the Rampur district have been used for multipurpose such as medicinal, ornamental, timber wood, edible fruits, avenue tree, fodder, firewood, religious, oil, handcraft, spices.

1022. **Singh, A.P. & Kumari, B. 2020.** "Angiospermic trees used by local people of Rampur district to treat various diseases as primary health care system". *Int. J. Bot. Stud.* 5(3): 258–263.

Abstract: Medico-botanical study was conducted during 2018-2019 for the documentation of medicinal trees in Rampur district. A total of 67 angiospermic trees belonging to 57 genera under 35 families were recorded for the first time. More than 45 diseases treated by different parts of trees, such as bark (20%) followed by flowers (19%), fruits (15), seeds (7%), gum, roots and nuts (3%), pods, peel and latex (2%) were recorded respectively. The family Mimosaceae showed maximum representation with 6 species. *Acacia catechu* (L.f.) Willd., *Acacia farnesiana* (L.) Willd., *Butea monosperma* (Lam.) Taub., *Erythrina variegata* L., *Helicteres isora* L., *Holoptelea integrifolia* (Roxb.) Planch, *Kigelia africana* (Lam.) Benth., *Prunus persica* (L.)

Batsch, *Terminalia bellirica* (Gaertn.) Roxb., *Terminalia chebula* Retz. and *Thespesia populnea* (L.) Sol. ex Corrêa are rare angiospermic trees in Rampur district.

1023. **Singh, A.P., Rajkumar & Kumari, B. 2020.** "A taxonomic study of grasses in Rampur district of Rohilkhand region (U.P.)". *Int. J. Bot. Stud.* 5(1): 118–121.

Abstract: Grasses are the members of Poaceae family which have great diversity and abundance. A total of 37 grass species of 30 genera under 6 subfamilies and 10 tribes. Panicoideae exhibits maximum representation with 20 species followed by, Chloridoideae (7 species), Pooideae (6 species), Bambusoideae (2 species), Ehrhartoideae and Arundinoideae (1 species) respectively. *Eragrostis* and *Saccharum* showed dominance with 3 species followed by *Bambusa*, *Setaria* and *Sorghum* with 2 species. *Cynodon dactylon* (L.) Pers., *Dactyloctenium aegyptium* (L.) Willd., *Desmostachya bipinnata* (L.) Stapf, *Dichanthium annulatum* (Forssk.) Stapf, *Phalaris minor* Retz. and *Triticum aestivum* L. are found in all tehsils of Rampur district.

1024. **Singh, B. 1999.** *A critical analysis of tree biology of dominant species of a Ganga-basin forest of outer Garhwal Himalaya at Rishikesh*. Ph.D. Thesis, H.N.B. Garhwal University, Srinagar. (unpublished).

1025. **Singh, B., Chauhan, R.S., Vashistha, R.K., Nautiyal, M.C. & Prasad, P. 2012.** "Ecological features of *Aconitum balfourii* (Bruhl) Muk.– An endangered medicinal plant in the northwest Himalaya". *J. Forest. Res.* 23(1): 145–150.

Abstract: *Aconitum balfourii* (Bruhl) Muk. (Ranunculaceae) is an endangered medicinal plant. Natural populations were surveyed in the northwest Himalaya for population estimation and evaluation of elite germplasm. Vegetation sampling of quadrats was conducted using the vertical belt transect method in areas supporting *A. balfourii*. Plant density and relative dominance of *A. balfourii* were low compared with other alpine species. Threat status was determined on a site-by-site basis as well as for entire western Himalaya. A. balfourii was generally classified as endangered on the basis of geographic distribution and critically endangered on the basis of abundance. We found the natural geographic distribution of A. balfourii to be diminishing due to habitat destruction. Immediate corrective management measures are needed for sustainable utilization and long-term conservation of the species in the wild.

1026. **Singh, B.P., Krishna, A., Singh, S.C. & Kumar, S. 2020.** "Angiospermic biodiversity of Lucknow areas of Uttar Pradesh, India". *Curr. J. Appl. Sci. & Technol.* 39(13): 101–109.

Abstract: The total angiospermic floral biodiversity of Lucknow district including indigenous, naturalised and cultigens comprises over 1263 plant species covering 705 genera and 140 families of which 989 species are dicotyledons and 274 species are monocotyledons. The monocotyledons are poorly represented except Poaceae and Cyperaceae. Of the 274 species of monocotyledons, 176 species belong to these two families while 98 species represent 23 different families. Poaceae is the largest family followed by Leguminosae (s.l.), Asteraceae, etc. and *Euphorbia* is the largest genus followed by *Cassia, Cyperus*, etc.

1027. **Singh, D. & Khanduri, V.P. 2005.** "Ecological status of *Eremostachys superba* Royle

ex Benth. in its type locality at Mohand, Siwaliks of Doon valley". *Indian Forester* 131(12): 1617–1619.

1028. **Singh, D.K. 2001.** "Orchid Diversity in Gori valley, Uttaranchal– A Conservation Perspective". *Ann. Forest.* 9(1): 23–35.

Abstract: The Gori valley in the Kumaon hills, with 121 taxa of orchids in 45 genera represents an orchid diversity hotspot in the Western Himalaya. *Bulbophyllum*, with 14 species, is the largest genus in the area, whereas 20 genera are represented by a single species in the valley. Ten species like *Dendrobium normale, Eria occidentalis, E. reticosa, Flickingeria hesperis, Herminium mackinnonii, Nervilea mackinnonii,* etc. are endemic. While species, like *Dactylorhiza hatagirea, Habenaria intermedia, Malaxis acuminate, Satyrium nepalense* etc. are highly valued medicinal plants, a number of them, like *Aerides* spp., *Ascocentrum ampullacium, Cymbidium* spp., *Coelogyne* spp., *Dendrobium* spp., *Rhyncostylis retusa, Thunia alba,* etc. also have considerable economic potential because of their ornamental nature. About 30 species have been identified as rare in the valley or vulnerable to various threats. The paper provides a conspectus of the orchids present in the valley and suggests the establishment of Orchid Sanctuary at Dafiadhura and Kaflani for their effective conservation.

1029. **Singh, D.K. & Hajra, P.K. 1996.** Floristic Diversity in Western Himalaya. In: Gujral, G.S. & Sharma, V. (Eds.), *Changing Perspective of Biodiversity Status in the Himalaya.* British Council, New Delhi. Pp. 23–39.

1030. **Singh, G. 2008.** *Diversity of Vascular Plants in Some Parts of Kedarnath Wildlife Sanctuary (Western Himalaya).* Ph.D. Thesis, Kumaun University, Nainital. (unpublished)

1031. **Singh, G. & Rawat, G.S. 2009.** Geospatial phyto-resources inventory in the outer fringe of Kedarnath Wildlife Sanctuary, Western Himalaya. Technical Report. Wildlife Institute of India (WII), Dehradun.

1032. **Singh, G. & Rawat, G.S. 2010.** "Is the future of oak *(Quercus* spp.) forests safe in the Western Himalaya?". *Curr Sci.* 98: 1420.

1033. **Singh, G. & Rawat, G.S. 2011.** Assessment of Banj Oak *(Quercus leucotrichophora)* Forests and its Conservation in Uttarakhand. Technical Report, Wildlife Institute of India (WII), Dehradun.

1034. **Singh, G. & Rawat, G.S. 2012a.** Depletion of Oak *(Quercus* spp.) Forests in the Western Himalaya: Grazing, Fuelwood and Fodder Collection. In: Okia, C.A. (Ed.), *Global Perspectives on Sustainable Forest Management,* pp. 29–41. (www.intechopen.com)

1035. **Singh, G. & Rawat, G.S. 2012b.** "Quantitative analysis of tree species diversity in different Oak *(Quercus* spp.) dominated forests in Garhwal Himalaya, India". *Notulae Scientia Biologicae* 4(4): 132–140.

Abstract: Himalayan broad-leaved forests are mainly dominated by oak (*Quercus* spp.) species. Oak species with other tree species provide numerous ecosystem services and serve as lifeline for local inhabitants. Overall tree diversity and their status in different oak dominated forests viz., *Quercus leucotrichophora* (1500-2200 m), Q. *floribunda* (2201-2700 m) and Q. *semecarpifolia* (2701-3300 m) were studied in Garhwal, Himalaya. A total of 54 tree species (40 genera) in Q. *leucotrichophora*, 43 tree species (30 genera) in Q. *floribunda* and 23 tree species (16 genera) in Q. *semecarpifolia* dominated forests were recorded. Lauraceae was the dominant family in Q. *leucotrichophora* and Q. *floribunda* forests (6 and 8 species respectively), while Ericaceae (3 species) was the dominant family in Q. *semecarpifolia* dominated forests. Pinaceae and Taxaceae were only two gymnospermic family represented by *Pinus roxburghii* at low, *Abies pinrow* at mid, *Abies spectabilis* and *Taxus wallichiana* at higher elevational oak forests. There was no significant variation (p=0.8) between overall tree density in different oak forests which ranges from 337±51 individual/ha in Q. *semecarpifolia* to 433±92 individual/ha in Q. *leucotrichophora* forests. The seedling density has significant variation (p=0.01) in different oak forests where highest density was recorded in Q. *leucotrichophora* forests (1981 individual/ha) and lowest in Q. *semecarpifolia* forests (348 individual/ha). The Total Basal Area (TBA) reported from Q. *leucotrichophora* (88.06 m2/ha) and Q. *floribunda* (110.5 m2/ha) forests was higher than those of earlier reported from the region, while basal area of Q. *semecarpifolia* (90.16 m2/ha) was comparable with the forests of western Himalaya.

1036. **Singh, G., Mathur, V.B. & Rawat, G.S. 2011.** *High Altitude Floristic Survey and Biodiversity Monitoring in Khiron Valley.* NDBR Technical Report, Wildlife Institute of India (WII), Dehradun.

1037. **Singh, G., Naithani, H.B. & Rawat, G.S. 2009.** "Observations on the flora of Mandal forest, Garhwal Himalaya, India". *Indian Forester* 135(2): 162-179.

Abstract: Systematic study on the vascular plants was conducted in the Mandal forest, located in the outer fringes of the Kedarnath Wildlife Sanctuary, Western Himalaya. 575 species of angiosperms (264 genera and 101 families(, 61 species of pteridophytes (33 genera and 21 families) and 4 species of gymnosperms (3 genea and 4 species) were recorded within about 10 km^2 between 1500 m to 2900 m altitude amsl. The dominant families were Poaceae (57), Asteraceae (44), Orchidaceae (36), Rosaceae (33), Lamiaceae (29), Cyperaceae (16) and Polygonaceae (16) in angiosperms and Polypodiaceae and Dryopteridaceae among the ferns. The study area forms only 0.28% of the total area of the erstwhile Chamoli district yet it harbours 28.44% of the angiospermic flora, which makes it one of the interesting sites for the plant diversity in the district.

1038. **Singh, G., Rai, I.D. & Rawat, G.S. 2012a.** "The mortality of Banj oak *(Quercus leucotrichophora* A. Camus) trees in Mussoorie, Uttarakhand: Is it an alarming call for rapid degradation?". *Curr. Sci.* 102: 1622–1623.

1039. **Singh, G., Rai, I.D. & Rawat, G.S. 2012b.** Alpine Meadows of Uttarkashi: Plant Species Diversity, Grazing Pressure and Conservation Status. Technical Report. Wildlife Institute of India (WII), Dehradun.

1040. **Singh, G., Rawat, G.S. & Jalal, J.S. 2009.** "Orchid diversity of Mandal valley in Kedarnath Wildlife sanctuary, Western Himalaya". *J. Orchid Soc. India* 23(1-2): 43–47.

Abstract: A study was conducted on the orchid in Mandal valley of Uttarakhand during 2005-2007. A total of 48 species belonging to 28 genera were recorded, of which 13 were epiphytic and 35 terrestrial. The diversity represents 20% of the orchids reported from the state of Uttarakhand. Maximum number of orchid species was found in warm temperate zone between 1500-2200 m asl. The result also shows that the species diversity decreases with increase in altitude. Temperate open forest had the maximum number of orchid species while rocky/boulders habitat had the least species richness.

1041. **Singh, G., Rawat, G.S. & Verma, D. 2010.** "Comparative study of fuelwood consumption by villagers and seasonal 'Dhaba owners' in the tourist affected regions of Western Himalaya, India". *Energy Policy* 38(4): 1895–1899.

Abstract: The rural inhabitants of the Himalayan region have been exploiting forest resources for their livelihood for generations. The excessive and uncontrolled use of firewood for domestic purposes has ended up with severe deforestation. Therefore, quantification, assessment and restoration of such valuable but exhaustible resources and is imperative their scientific management. The estimates reflect that a total of 88 species are consumed as fuelwood (54 trees and 34 shrubs) by the local people. Fuelwood consumption by 'dhaba' (roadside refreshment establishments) owners (90–120 kg/household/day) was much higher over the common villagers (20–22 kg/household/day). The fuelwood is mainly burnt for cooking, water heating, space heating and lighting, etc. Among these, cooking consumes the fuelwood most. In addition, fuelwood demand increases due to influx of tourists. In the near future, this may also affect the status of the undisturbed forests at the middle elevation. The information in this communication could be utilized for developing various conservation and sustainable strategies in the region to mitigate the impact of forest resource for fodder and fuelwood.

1042. **Singh, H. & Kumar, S. 1975.** "A further contribution to the flora of Pindari glaciers in Kumaon hills". *Geobios* 2: 144–147.

Abstract: This paper is a supplement to the list of plants reported by Rao (1960). It includes 56 species representing 38 genera from 25 families.

1043. **Singh, J.N. & Mudgal, V. 1999a.** "Edaphic nature of woodland habitat of Dudhawa National Park, Kheri, Uttar Pradesh– Part – I". *Indian J. Forest.* 22(3): 285–291.

Abstract: The present investigation is aimed at the assessment of the edaphic nature of the woodland habitat of the Dudhawa National Park (DNP). It is elucidated from the results that mechanically, soils are competent to hold the vegetations in their present form. Chemically, the soils, in general, possess significantly the high quantum of silica, sesquioxides and iron-oxide. Their organic carbon and nitrogen content are satisfactory only in the surface soils but their water holding capacity and pososity are quite congenial to bear the vegetations of either evergreen, semi-evergreen or deciduous in nature. In the end paper has been concluded with possible suggestions.

1044. **Singh, J.N. & Mudgal, V. 1999b.** "Edaphic nature of the grassland habitat of Dudhawa National Park, Kheri, Uttar Pradesh– II". *Indian J. Forest.* 22(4): 400–404.

Abstract: In this investigation the edaphic nature of the grassland habitat system has been analysed and discussed. From the results, it is held that these soils are exceptionally high in silica content, sesquioxides and iron oxide. The release of vital cations and anions in their respective soil solutions is relatively poor. However, the soils are highly satisfactory for energy materials content, available nitrogen and water holding capacity but very poor in available phosphorus. In the end paper has been concluded with possible suggestions.

1045. **Singh, J.S. & Kushwaha, S.P.S. 2008.** "Forest biodiversity and its conservation in India". *Int. Forest. Rev.* 10(2): 292–303.

Abstract: With its varied climate and terrain, and characterised by at least 10 distinct bio-geographical regions, India supports a huge variety of forest types and harbours three global terrestrial biodiversity hot spots. Most of the terrestrial biodiversity now resides in the forest, as other terrestrial habitats have lost their natural state. An impressive protected area network, comprising 509 wildlife sanctuaries, 96 national parks (including 14 biosphere reserves), and several sacred groves maintained by indigenous communities, is in place. However, despite a benign forest policy and a strong regulatory regime, forest degradation and biodiversity loss continue because of the increasing requirements of the burgeoning human population, land use change and spread of invasive alien species. The extent and loss of biodiversity must be continuously monitored and people attracted to participate in biodiversity conservation rehabilitation on a massive scale.

1046. **Singh, J.S. & Mitra, K. 1964.** "Ecological observations along the river banks at Allahabad, U.P.". *Bull. Bot. Surv. India* 6(2-4): 137–140.

Abstract: This paper embodies the ecological observations made along the exposed riverbeds and the immediate banks of the rivers Jamuna and Ganga at Allahabad during the months of April to June in 1962 and 1963. The physical features, climate and soil of the area are discussed. Botanical composition of the vegetation and the relative abundance, preference for habitat types, and phenology of the important species are given. The vegetation is characterised by the preponderance of annual plants and consists of the species of the wet meadow and dry meadow stges of Dudgeon (1920). The thorm scrub stage is represented by *Acacia arabica* and *Zizyphus jujuba*.

1047. **Singh, J.S. & Singh, S.P. 1984.** Structure and functioning of the forest ecosystem of Central Himalaya. Implications for management, regeneration of forest trees: An integrated ecological study of Eastern Kumaun Himalaya with emphasis on Natural Resources. Final Report, Kumaun University, Nainital, Vol. 2: 85–113.

1048. **Singh, J.S. & Singh, S.P. 1987.** "Forest Vegetation of the Himalaya". *Bot. Rev.* 53: 80–191.

Abstract: This review deals with the forest vegetation of the Himalaya with emphasis on: paleoecological, phytogeographical, and phytosociological aspects of vegetation; structural and functional features of forest ecosystem; and relationship between man and forests.

1049. **Singh, J.S. & Singh, S.P. 1992.** *Forests of Himalaya: Structure, Functioning and Impact on Man.* Gyanodaya Prakashan, Nainital.

1050. **Singh, K.K. 1982a.** "Floristic elements in the vegetation of Kheri district, Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 3: 557–563.

Abstract: The paper deals with the thirteen floristic elements represented in the vegetation of Kheri district of Uttar Pradesh. The thick forests belts of the district are situated in the Terai region of the foothills of Himalaya in close vicinity of the territory of Nepal, separated by the Mohan River. These forests are of moit deciduous type and possess interesting floristic elements in its vegetation. Based on the vegetational composition, the forests are grouped into four types viz., Sal forests, mixed forests, swamp forests and grasslands. The present study is based on the geographical distribution of naturalised and indigenous species occurring in the vegetation of the district. During this study 13 floristic elements were recognised in the vegetation of the district. In the sal forests the Indo-Malayan elements are dominant. The co-dominant group is represented by the tropical elements which are widely distributed in the vegetation of the district. The Indian element is fairly well represented in the flora. The occurrence of species like *Convolvulus microphyllus* Sieb. ex Spreng., *Leptademia pyrotechnica* (Forssk.) Decne and *Zizyphus nummularia* (Burm.f.) Wight & Arn. is interesting, as these represent Saharo-Sindian element. The species *Cymbopogon osmastonii* Parker is endemic to the forests of Kheri district.

1051. **Singh, K.K. 1982b.** "Studies on the Grasses of Kheri district, Uttar Pradesh". *J. Bombay Nat. Hist. Soc.* 79(3): 515–521.

Abstract: This paper gives an account of the grasses of Kheri district. A dichotomous key to the genera of Poaceae is included. Fifty four genera and seventy species are described from this area. Ecological notes, phenology, local names and field numbers are provided to the species.

1052. **Singh, K.K. 1992.** "Studies on the flora of Dudhwa National Park, Kheri district, Uttar Pradesh– Part III". *J. Econ. Taxon. Bot.* 16(1): 141–153.

Abstract: In the present communication seventy five species belonging to 10 families has been reported from Dudhwa National Park, Kheri district, Uttar Pradesh.

1053. **Singh, K.K. 1997.** *Flora of Dudhawa National Park, (Kheri district, U.P).* Bishen Singh Mahendra Pal Singh, Dehradun. Pp. 516.

1054. **Singh, K.K. & Bhati, H.S. 1979.** "Exotic flora of Kheri district, Uttar Pradesh". *Bot. Progress* 2: 70–73.

1055. **Singh, K.K. & Maheshwari, J.K. 1984.** "Studies on the flora of Dudhwa National Park, Kheri district, U.P. (Part– I)". *J. Econ. Taxon. Bot.* 5(2): 379–391.

Abstract: This paper deals with the flora of Dudhwa National Park, Kheri district, U.P. The park is a centre of great attraction to the visitors, foreigners and wildlife experts. No literature on the flora of this Park is available. The present study was, therefore, undertaken with a view to prepare an annotated list of flowering plants and ferns of the Park. The vegetation of the Park, botanical names, local names, flowering and fruiting seasons, habit, habitat, local uses and field numbers of the plants studied are provided in this paper. It is hoped that this work will be useful to the foresters, botanists,

wildlife experts and amateurs interested in the flora and plant life of this National Park.

1056. **Singh, K.K. & Maheshwari, J.K. 1985a.** "Forest in the life and economy of the tribals of Varanasi district, Uttar Pradesh". *J. Econ. Taxon. Bot.* 6(1): 109–116.

Abstract: The paper present the role of forest in the life and economy of the tribals of Varanasi district of Uttar Pradesh. Plants used for food, fibre, medicine, oil, house building material, fuel and for making cordage and ropes have been mentioned.

1057. **Singh, K.K. & Maheshwari, J.K. 1985b.** "Studies on the flora of Dudhwa National Park Kheri district (U.P.), Part II". *J. Econ. Taxon. Bot.* 6(3): 539–562.

Abstract: This paper deals with the flora of Dudhwa National Park, Kheri district, U.P. The present study was, therefore, undertaken with a view to prepare an annotated list of flowering plants and ferns of the Park. The vegetation of the Park, botanical names, local names, flowering and fruiting seasons, habit, habitat, local uses and field numbers of the plants studied are provided in this paper.

1058. **Singh, K.K. & Prakash, A. 1994a.** "Studies on forest ecosystem diversity of Rajaji National Park, Uttar Pradesh– In a conservation perspective". *Indian Forester* 120(10): 880–889.

Abstract: Rajaji National Park is situated in the Siwalik Forest Division, Uttar Pradesh and has an area of approximately 820.40 km^2. The diverse forest ecosystems of the park provide an ideal habitat for many wild animals. The forests are classified under the Northern Tropiacl Moist Deciduous Types having varied and diverse ecosystems. A general survey of the forests revealed some important types of plant association like *Shorea, Mallotus* and *Adina* community; *Shorea-Terminalia* and *Bridelia* community-*Syzygium*, *Phoebe* and *Drypetes* community etc. Based on the physiognomy and floristic compositions, the forests may be grouped into six types namely (1) Sal forest, (2) Mixed forest, (3) Riverine forest, (4) Scrubland, (5) Grassland (Savannah) and (6) Sub-tropiacl Pine Forest. The dominant tree species *Shorea robusta* Gaertn. f. forms pure belt of Sal forest in major part of the park. Factors affecting the vegetation and plant-animal interaction have been given in this paper. Discussing the depleting plant resources, the possible causes and effective measures for conservation of threatened species are provided in this paper.

1059. **Singh, K.K. & Prakash, A. 1994b.** "Tree wealth in the life and economy of the tribals of Uttar Pradesh, India". *Indian J. Forest.* 17(2): 154–160.

Abstract: Tree wealth plays a vital role in the life and economy of many of the tribals of Uttar Pradesh, who inhabit the hill region, the terai and the plains in large numbers. There are about 3000 plant species that yield important forest produce and provide sustenance to the tribal people as well as having some commercial importance. The tribals have learned to utilize many trees and tree products for their food, fibre, medicine, oil, timber and woodworking material, gums, resin, lac, tannin, dye, fuelwood, etc. Details are given of species occurring in these various categories. The important protective/ecological role of these trees is also emphasized.

1060. **Singh, K.K. & Prakash, A. 2002.** *Flora of Rajaji National Park,* Uttaranchal. Bishen Singh Mahendra Pal Singh, Dehradun.

1061. **Singh, K.K. & Singh, S.C. 1983.** "Observation of weeds of wheat fields of Lucknow, Uttar Pradesh". *J. Econ. Taxon. Bot.* 4: 223–231.

Abstract: The paper reports eighty five species, sixty eight genera belonging to thirty one families of weeds invading the wheat fields of Lucknow. The habit, phenology, local names and abundance of weeds have been recorded in this paper. The study shows that out of eighty five species, mainly species like *Chenopodium album* L., *Avena fatua* L., *Phalaris minor* Retz., *Anagallis arvensis* L. and *Euphorbia dracunculoides* Lamk. compete with wheat plants for nutrients and space brining down the yields. During the survey *Amaranthus tenuifolius* Willd. recorded as a new species for the district. The number of species is shown in tabular form against their respective families.

1062. **Singh, K.K. & Singh, S.P. 2018.** "Cultivation and utilization in Phalsa (*Grewia asiatica* L.) under Garhwal Himalayas region". *J. Med. Pl. Stud.* 6(1): 254–256.

Abstract: Phalsa is a fruit of Indian and Southeast Asia origin. Phalsa (*Grewia asiatica* L.) belongs to Tiliaceae family. It prefers dry and hot environment during fruiting. In winter it goes dormant and shed its leaves. High temperature of June helps in fruit ripening. Phalsa is commercially propagated by seed. The fruits are eaten fresh as dessert, are made into sirup, and extensively employed in the manufacture of soft drinks.

1063. **Singh, K.K. & Tomar, R.P.S. 1982.** "The aquatic and marshland flora of Kheri district, Uttar Pradesh". *J. Bombay Nat. Hist. Soc.* 79(2): 261–274.

Abstract: The paper presents an account of the aquatic and marshy angiosperms of Kheri district, Utta Pradesh. Topographical and climatic conditions of the area have been described. The whole area of present investigation comprises six main forest ranges and distribution of species along with field numbers is recorded. The present study shows that 179 species of angiosperms belonging to 54 families inhabit the lakes, ponds, swamps, marshes and river banks of the district.

1064. **Singh, K.K., Bhati, H.S. & Maheshwari, J.K. 1979.** "Survey and biological activity of economic plants of Kheri forests, Uttar Pradesh". *Indian Forester* 105(7): 534–545.

Abstract: The forest areas of Kheri district adjoining Indo-Nepal Border have been explored from the point of view of the availability of economic and medicinal plants used either in indigenous system of medicine or by the local people. The present communication gives information on therapeutic properties of 89 species belonging to 44 families of plants inhabiting the forest areas of the district. The vegetable resources of the district are quite rich in raw materials for the local cottage industries like kattha, paper mill, timber and minor forest products.

1065. **Singh, K.P., Shukla, A.N. & Singh, J.S. 2010.** "State-level inventory of alien plants, their source regions and use potential". *Curr.* Sci. 99(1): 107–114.

Abstract: A comprehensive inventory of the invasive alien flora of India's fifth largest and most populous state, Uttar Pradesh, revealed 152 species from 109 genera and 44 families. Dicots represented 137 species and monocots 15 species. About 73% of these alien species were introduced from tropical America including South America, followed by tropical Africa (10.5%). Maximum number of species (30) were from the

family Asteraceae, followed by Fabaceae (12 species), and then Amaranthaceae, Solanaceae and Convolvulaceae with eight species each. Herbs accounted for 128 species, shrubs 12 species, climbers 8 species, whereas trees and lianas 3 and 1 species respectively. People have found a large number of these alien species useful.

1066. **Singh, M. & Ali, S.J. 2008.** "A study on aquatic angiosperms of district Mau (East U.P.)". *J. Econ. Taxon. Bot.* 32(4): 877–890.

Abstract: During the course of study on aquatic angiosperms of district Mau, 143 species belonging to 101 genera and 46 families were recorded. Besides correct botanical name of the species, their habitat, flowering and fruiting periods, local name, if any, and the category of hydrophyte is given. Physiography of the area and the climate type is also mentioned.

1067. **Singh, M. & Singh, M.P. 2015.** "Study of most common aquatic macrophytes and conservation of wetland resources in Jaunpur". *J. Econ. Taxon. Bot.* 39(1): 174–181.

Abstract: Present paper enumerates and highlights the floristic survey of most common aquatic macrophytes of 79 species belonging to 33 families, which comprise 21 blocks, 6 tehsils in district Jaunpur. Maximum number of plants observed was 12 of Cyperaceae followed by 10 and of Poaceae and Asteraceae, respectively. It also aims to evaluate habit, life form, ecological habitat and some important phonological growth stages of reported macrophytes. Physiography of the area and climate are also mentioned. Finally it deals with the strategies for conservation of wetlands, their biodiversity and other resources for the material benefit of mankind to raise GDP of the nation.

1068. **Singh, M.K., Tripathi, A.K., Jeeva, V., Chandra, S. & Vandana. 2017.** "Floristic diversity of Asan wetland, Uttarakhand - A checklist". *Indian J. Forest.* 40(2): 133–137.

Abstract: Asan wetland is a man-made wetland located in Uttarakhand state. In the given study, efforts have been made to study the floristic diversity and species composition of the aquatic macrophyte in Asan wetland and provide a check list. Sixty seven species were recorded under 32 families being maximum in Cyperaceae followed by Poaceae and Asteraceae. Remaining families comprised either one or two species each. Among all the recorded species, monocots (54%) were dominated over dicots (42%) and remaining 4% comprised ferns. Herbaceous macrophytes were found growing abundantly (54%) which are followed in degree of prevalence by the grasses (21%), sedges (18%), shrubs (4%) and climbers (3%). In addition, this study also revealed that pollution resistant species like *Bacopa monnieri, Hydrilla verticillata, Vallisneria spiralis* and *Eichhornia crassipes* along with tall grass species which grow in shallow water are spreading considerably that indicates an increasing pollution in the wetland. The present study will provide an important set of informations to support research work like limnological studies, productivity, conservation and management programs of this wetland.

1069. **Singh, M.P., Singh, P. & Singh, A. 2013.** "Invasive alien plants species of Varanasi district, their source region and use potential". *J. Econ. Taxon. Bot.* 37(1): 116–129.

Abstract: Present paper is the result of three years of extensive exploration of the area. 120 important alien species are recorded with their legitimate botanical names, families, origin, habit, habitat and uses. Some important plants are *Ageratum conyzoides* L., *A. houstonianum* Mill., *Alternanthera pungens* Kunth, *Argemone mexicana* L., *Chenopodium album* L., *Croton bonplandianum* Baill., *Eichhornia crassipes* (Mart.) Solms, *Lantana camara* L., *Parthenium hysterophorus* L., *Calotropis gigantea* (L.) R. Br., *Senna occidentalis* (L.) Link, *Cryptostegia grandifloar* R. Br., etc.

1070. **Singh, N.P. 1969a.** "Flora of Bulandshahr district". *Bull. Bot. Surv. India* 11(1&2): 1–22.

Abstract: The paper gives an account of the vegetation of the district of Bulandshahr district in central Uttar Pradesh. Edaphic, climatic, biotic and other factors determining the floristic composition of the district have been discussed in this paper. Aquatic and cultivated plants, avenue rees and orchard plants have been mentioned. A list of 376 species has been appended to given an idea of the flora of the district. *Cuscuta capitata* Roxb. and *Clinopodium umbrosum* (M. Bieb.) Koch have been reported for the first time from the U.P. plains.

1071. **Singh, N.P. 1969b.** "Weed flora of some fields and plantations of Dehra Dun". *Bull. Bot. Surv. India* 11(3&4): 350–361.

Abstract: The paper gives an account of weeds occurring in wheat, paddy and sugarcane fields and tea plantations in the neighbourhood of Dehra Dun, Uttar Pradesh. Phenological data of weeds thus collected have been given. A list of 204 species has been appended to give an idea of weeds occurring in the above said crops. Floristic analysis has been given in order to discuss the composition of the weed flora. During the study, *Vicia tetrasperma* (Linn.) Moench. and *Acalypha australis* Linn. were recorded for the first time from the Upper Gangetic Plains and India respectively, which have been published as separate notes.

1072. **Singh, N.P. & Srivastava, R.C. 2000.** "Diversity and economic importance of wetland flora of eastern Uttar Pradesh". *Bull. Bot. Surv. India* 42(1-4): 91–108.

Abstract: The paper throws light on diversity, economic importance and conservation aspects of the flora of the welands of Eastern Uttar Pradesh state of India. The study has revealed the occurrence of 162 species belonging to 108 genera and 49 families of angiosperms. One new record for the state, one new distributional record and one new use of a wetland species are recorded.

1073. **Singh, O.P. & Singh, S.K. 1972.** "Aquatic angiosperms of Jaunpur". *Bull. Bot. Surv. India* 14(1-4):104–113.

Abstract: The present paper deals with an investigation of aquatic angiosperms of Jaunpur district, Uttar Pradesh. Geography, climate and ecological classification of the species along with diagnostic features and phenology are described. In all, 127 species representing 91 genera and 44 families have been recorded.

1074. **Singh, P., Attri, B.L. & Das, B. 2014.** "A comparative study on plant biodiversity of Oak (*Quercus semecarpifolia* Smith) and mixed Oak-Deodar (*Cedrus deodara* D. Don) forests in Central Himalayan Region of Uttarakhand". *Indian Forester* 140(4): 368–373.

Abstract: Present study concluded that the total plant species was greater in oak-deodar mixed forest in Central Himalayan region. This type of forest recorded more trees and shrubs whereas oak dominated forest constituted higher herbs. The tree and herb density was 1700 and 92000 respectively in oak dominated forest whereas shrub density was 2356 per ha. The A/F ratio of trees and shrubs was 0.363 and 1.39 in the mixed forest as compared to 0.023 and 0.89 in oak dominated forest. Further, A/F ratio of herbs was 1.45 in the latter to that of 0.6 in the former. The total cover (%) of shrubs was 5.23 and 6.18 whereas for herbs it was recorded as 13.46 and 10.29 in oak dominated and mixed oak-deodar forest respectively. The diversity of trees and shrubs was better in mixed oak-deodar forest whereas for herbs it was higher in oak dominated forest. The assessment of the plant biodiversity in different forests revealed that various disturbances do not provide time for the ecosystem recovery and widen the forest gap and fragmentation of the land in the region.

1075. **Singh, P., Singh, A. & Singh, M.P. 2015.** "Invasive alien species of Vindhyam range of Uttar Pradesh, India their source of origin and use potential". *Indian J. Forest.* 38(2): 135–145.

Abstract: Vindhyam range of Uttar Pradesh, India comprises 149 alien species under 106 genera belonging to 44 families. On analysisng the data it was observed that 73% of alien species are from tropical America including South America and 10.5% from tropical Africa. Present study is based on several years of intensive exploration of rthe area. Excursions were undertaken in different areas at regular intervals. During excursions, information regarding important alien species with their legitimate botanical name, families, local name, brief description along with flowering and fruiting time were recorded.

1076. **Singh, P., Pusalkar, P.K., Srivastava, S.K., Lakshminarasimhan, P. & Kumar, B. 2015.** *Kedarnath Natural Disaster– Impact on Flora.* BSI, Kolkata.

1077. **Singh, P.K. & Narain, S. 2016.** "Highly extensive height of *Conyza canadensis* in Uttar Pradesh". *Int. J. Curr. Res.* 8(3): 28123–28124.

Abstract: The present study focuses on family Asteraceae is reinvestigated in various districts of Uttar Pradesh in which *Conyza canadensis* showing highly extensive length about 280 cm in Gorakhpur district. This species showing length about 15-90 cm in Flora of British India, 90 cm in Flora of Upper Gangetic Plain, 30-70 cm in Flora of Madhya Pradesh and 15-90 cm in Flora of India. During the floristic investigation this species are collected from different regions of Uttar Pradesh. This species was identified on the basis of morphological, anatomical and floral characters. A taxonomic account of *C. canadensis* has been given along with their current valid name, flowering and fruiting, habit, locality and specimen voucher number.

1078. **Singh, R. & Narain, S. 2006.** "Additions to the flora of Gorakhpur district, Uttar Pradesh– Family Fabaceae". *J. Non-Timber Forest Prod.* 13(4): 287–289.

Abstract: The paper gives an account of 8 species belonging to 6 genera of the family Fabaceae which are new additions to the flora of Gorakhpur district.

1079. **Singh, R.K. 2016.** "Plants of associated Botanic Garden, Botanical Survey of India, Central Regional Centre, Allahabad". *J. Non-Timber Forest Prod.* 23(1): 37–54.

Abstract: The plants growing in Associated Botanic Garden, Botanical Survey of India, Central Regional Centre, Allahabad are enumerated with habit and phenology. It

comprises about 663 species in all with 181 species of trees, 168 species of shrubs, 38 species of undershrubs and 276 species of herbs (including 10 aquatic plants) under 116 families.

1080. **Singh, R.P., Prasad, J. & Bahar, N. 1992.** "*Cotoneaster microphylla* Wall.: A suitable species for soil conservation in temperate regions of Himalayas". *Indian Forester* 118(9): 672–675.

Abstract: *Cotoneaster microphylla* Wall.., seed has seed coat dormancy and concentrated sulphuric acid treatment proved effective in hastening germination. Roots of a single plant can bind soil upto 1.88 m^2 with the strong lateral and fibrous roots. The taper rate of lateral roots varies from 0.10 to 0.16 which itself is an indication of strong roots. Intricately branched aerial portion of this species spreads on an average over 2.26 m^2 land surface and helps in checking splash erosion.

1081. **Singh, R.S., Ralhan, P.K. & Singh, S.P. 1987.** "Phytosociology and population structure of Oak-mixed conifer forest in a part of Kumaun Himalaya". *Environm. & Ecol.* 5(3): 475–487.

Abstract: The phytosociological analysis and population structure of the forest of the Government House site Nainital in Kumaun Himalaya were studied. The site was divided into eight compartments. Based on phytosociological analysis the site represented three major forest types: *Quercus floribunda* forest, mixed-oak conifer forest and *Cedrus deodara* forest. The population structure of *Q. floribunda* showed that the perpetuation of this species as a dominant is ensured for long time, while the population structures of *C. deodara* and *Cupressus torulosa* showed that they may disappear if the present trend persists.

1082. **Singh, S.C. 1984.** "Ornamental plants of Lucknow district, U.P., India". *J. Econ. Taxon. Bot.* 18(3): 677–690.

Abstract: A survey of ornamental plants in Lucknow district of U.P. was undertaken and the result in the form of 163 species under 53 families is presented.

1083. **Singh, S.C. 1998.** "Asteraceae of Lucknow district, Uttar Pradesh". *J. Econ. Taxon. Bot.* 22(3): 587–599.

Abstract: In the present communication, 64 species under 42 genera are enumerated. Out of which 25 species are medicinal and most of them having biologically active principles.

1084. **Singh, S.C. 2009.** "Contribution to the flora of Lucknow district". *J. Econ. Taxon. Bot.* 33(2): 437–442.

Abstract: The present paper deals with 33 species recorded for the first time from Lucknow district. Earlier works and taxa reported from the district have also been reviewed to present correct status of the flora.

1085. **Singh, S.C. & Khanuja, S.P.S. 2006.** *Lucknow Flora - The plant wealth of the region.* Central Institute of Medicinal and Aromatic plants, VIII. Pp. 522.

1086. **Singh, S.C. & Shah, N.C. 1990.** "Contribution to the flora of Lucknow– 1. Wild species". *J. Econ. Taxon. Bot.* 14(1): 237–238.

Abstract: In the present communication, thirteen interesting wild species has been collected for the first time for the flora of Lucknow.

1087. **Singh, S.C. & Shah, N.C. 1991.** "Contribution to the flora of Lucknow- 2. Cultigens". *J. Econ. Taxon. Bot.* 15(3): 599–601.

Abstract: In the present paper twenty one plant species grown along roadsides and escapes from cultivation have been reported first time from Lucknow.

1088. **Singh, S.K. & Dixit, S.N. 1969.** "Cyperaceae of Jaunpur district". *Bull. Bot. Soc. Bengal* 23: 199–202.

1089. **Singh, S.K. & Dixit, S.N. 1971.** "Forest flora of Nichlaul– III. Phytosociological studies". *Bull. Bot. Surv. India* 13(3&4): 180–186.

Abstract: The resent paper deals with the phytosociological studies of Nichlaul forest, Gorakhpur Division. Important features of the forest concerning geographical location, topography, soil, climate and vegetational composition have been outlined. Eight types of plant communities have been recognised. The phytosociological characters noted in the field on visual estimation are dominance and sociability of perennial species. Only selected associates of the communities have been included in the tble. The eight types of communities described appear o be interrelated floristically. The sociological values shows that 17.8% of the species are common to all the eight communities indicating a high degree of congruity.

1090. **Singh, S.K. & Dixit, S.N. 1972a.** "Cyperaceae of Gorakhpur". *Indian Forester* 98(2): 116–129.

Abstract: The present paper deals with the systematic treatment of the sedge flora of Gorakhpur. In all, 63 species belonging to 7 genera have been collected so far. A brief account of their inhabitants, phenology and collection number are given in this enumeration list. Key to the genera and species have also been provided for the easy identification of Cyperaceae of the area.

1091. **Singh, S.K. & Dixit, S.N. 1972b.** "Forest flora of Nichlaul– IV. Trees". *Bull. Bot. Surv. India* 14(1-4): 46–70.

Abstract: This paper enlists the trees found in Nichlaul forest, Gorakhpur Division, Uttar Pradesh. Geographical limits, topography, edaphic and climatic factors of the area, its vegetational composition, injurious factors, phonological behaviours of the common plants and an artificial key to the families as well as to the species are given. In all, 109 tree species belonging to 91 genera and 44 families are included, giving field observations, local names, habit, habitat, dominance and sociability. Flowering and fruiting seasons as well as collection numbers of plants are indicated.

1092. **Singh, S.K. & Rai, J.P.N. 2004.** "Vegetation pattern related to grazing pressure in alpine meadows of Nanda Devi Biosphere Reserve". *J. Environm. Biol.* 25(3): 299–306.

Abstract: The present study aims to analyze the interaction of prevailing biotic pressure on plant species diversity in Nanda Devi Biosphere Reserve (NDBR) which lies in northern part of Uttaranchal hills between 79°40'E to 80°05'E longitude and 30°17' N to 30°41'N latitude and covers an area of 2236.7 km^2. A total of 75 species has been found which included the herbaceous plants viz., grasses, sedges and forbs. Generally, the plants have a short life span of 3-4 months. However, few species persist throughout the growth period i.e. May-October. Phytosociological study performed in plots of varying slope and grazing pressure intensity revealed that the dominant grasses were *Danthonia cachemyriana* and *Poa annua* and dominant forbs were *Trachydium roylei* and *Geum elatum* in all the plots. Grasses were abundant on west facing slopes while forbs preferred the even topography of east facing meadows. The grasses and sedges together had optimum density during July and August. In general, short lived species exhibited more diversity for one or two months whilst the long lived species exhibited optimum diversity althrough the snow free period. The species diversity is maximum (100%) in moderately grazed bughiyals i.e. Pacchu and minimum in intensively grazed bughiyals i.e. Martoli. The species distribution among the plots was 60-90% contagious and 11.2-38.0% randomirrespective of grazing pressure, thus highlighting the significance of grazing pressure in management of alpine meadows.

1093. **Singh, S.K. & Singh, O.P. 1979.** "Weed flora of paddy crop in Jaunpur, Uttar Pradesh". *Oryza* 16: 113–114.

1094. **Singh, S.K. & Verma, K.R. 1988.** "An interesting dwarf cone of Chir-Pine". *Indian Forester* 114: 240.

1095. **Singh, S.K., Saini, D.C. & Dixit, S.N. 1985**. "Cyperaceae of Basti district". *Res. J. Pl. Environm.* 2: 1–19.

1096. **Singh, S.K., Ojha, C.K., Saini, D.C. & Singh, M.P. 1979.** "An enumeration of the host range and ethnobotanical study of *Dendrophthoe falcata* (L.f.) Ettings in Eastern terai region of Uttar Pradesh". *Environm. India* 2: 1–4.

1097. **Singh, S.M. & Narain, S. 2012.** "Diversity of aquatic and wetland macrophytes in Keetham lake, Uttar Pradesh, India". *Phytotaxonomy* 12: 181–186.

Abstract: The present paper provides an account of the aquatic and wetland macrophytes of Keetham lake of Agra district of Uttar Pradesh, India. Besides current status, botanical names of the species, their habit and habitat, flowering and fruiting periods and physiography of the area is mentioned. During investigation 119 species of 78 genera and 45 families were identified.

1098. **Singh, S.P. 1992.** Pattern of soil and vegetation and factors determining their forms and hydrologic cycle in Nanda Devi Biosphere Reserve. Pp. 176. Department of Environment & Forests, Govt. of India, New Delhi.

1099. **Singh, S.P. 1996.** Forest wealth of Uttarakhand. In: Valdiya, K.S. (Ed.), *Uttarakhand Today.* Shree Almora Press, Almora. Pp. 93–100.

1100. **Singh, S.P. 2000.** "Mass flowering of Himalayan Dwarf Bamboo". *Curr. Sci.* 79: 694.

1101. **Singh, S.P. & Kumari, B. 2017.** "A study of family Cyperaceae from JP Nagar (Amroha) district of Uttar Pradesh'. *Int. J. Bot. Stud.* 2(5): 86–88.

Abstract: The paper gives an account of sedges of the J.P. Nagar (Amroha) district. A total of 18 species under 7 genera were collected and identified during the year 2016 for the first time. Genus *Cyperus* found dominant having 8 species followed by *Scirpus* (3 species), *Eleocharis* and *Fimbristylis* (2 species) while *Bulbostylis*, *Carex* and *Pycreus* have 1 species each. Species were distributed widely in marshy places, rice fields, pond and in wetlands. The species are used economically as animal food, medicinal; while some as environmental and others are invasive.

1102. **Singh, S.P. & Kumari, B. 2018.** "Grasses of JP Nagar (Amroha) district of Uttar Pradesh'. *J. Med. Pl. Stud.* 6(2): 159–161.

Abstract: This paper gives an account of grasses of district J. P. Nagar (Amroha) of Rohilkhand region. A total of 46 species of 38 genera belonging to 6 subfamilies and 11 tribes were recorded under family Poaceae. Subfamily Panicoideae (25 species) was the dominant followed by Chloridoideae (9 species), Pooideae (6 species), Ehrhartoideae (2 species), Bambusoideae (2 species) and Arundinoideae (1 species). In the study area, the ratio of subfamily to genus was 1: 6.33, subfamily to species was 1: 7.66 and genus to species was 1: 1.21. Genus *Eragrostis* and *Saccharum* found dominant with 3 species followed by *Dactyloctenium, Setaria* and *Sorghum* with 2 species, while other genera have 1 species each. Some species were used economically as medicinal, fodder and for other purposes.

1103. **Singh, S.P. & Kumari, B. 2019.** "Distribution and beneficial uses of invasive alien angiosperms in the roadside areas of JP. Nagar, Uttar Pradesh. *J. Med. Pl. Stud.* 7(3): 8–11.

Abstract: A survey of invasive alien angiosperms of J.P. Nagar was made and we found a total richness of 24 species belonging to 14 families. Dicots represented 22 species and monocots 2 species. About 54.16% of these angiosperms were introduced from Tropical America and maximum number of angiosperms (6) were from the family Asteraceae. *Parthenium hysterophorus* L. shows highest frequency (69.23%) followed by *Ageratum conyzoides* (L.) L. (53.07%), *Alternanthera ficoidea* (L.) Sm. (42.30%), *Sida acuta* Burm.f. (39.16%) and *Euphorbia hirta* L. (36.15%). Many of the invasive alien species are of economic importance also, due to which some alien species, often cultivated (ornamental), may provide food, medicine, and fodder to the local communities.

1104. **Singh, S.P., Adhikari, B.S., Garkoti, S.C. & Rawat, Y.S. 1996.** Structural and functional characteristics of the forest ecosystems around Nanda Devi Biosphere Reserve. In: Ramakrishnan, P.S. & *al.* (Eds.), *Conservation and Management of Biological Resources in Himalaya.* G.B. Pant Institute of Himalayan Environment & Development, Almora. Pp. 413–432.

1105. **Singh, S.P., Sah, P., Tyagi, V. & Jina, B.S. 2005.** "Species diversity contributes to productivity - evidence from natural grassland communities of the Himalaya". *Curr. Sci.* 89(3): 548–552.

Abstract: The impact of species diversity on ecosystem functioning has generated considerable research and tremendous debate in view of the accelerated depletion of biodiversity worldwide. A number of recently conducted experiments based on synthetic assemblages of plant species indicated that ecosystem productivity declines with loss of species. The problem with acceptability of this hypothesis is that in spite of best efforts, conditions created in the experiments fall short of natural conditions. The present study, which was carried out in alpine grasslands of Himalaya, is from natural ecosystems to lend support to the above hypothesis. It emphasizes that with the depletion of biodiversity, we are going to lose some of the life-supporting ecosystem services.

1106. **Singh, U.N. & Ambasht, R.S. 1980.** "Floristic composition and phytosociological analysis of three grass stands in Naugarh forest of Varanasi Division". *Indian J. Forest.* 3(2): 143–147 & 3(3): 223–230.

Abstract: The present study, i.e. floristic composition and phytosociological analysis is based on three grass stands, viz., completely protected (Site I) for two years, semiprotected (Site II) for four years and open grazed (Site III), Site I and II both dominated by *Heteropogon contortus* and site III domnated by *Vetiveria zizanioides* are situated on Vindhyan hill plateau in Naugarh forest of Varanasi division. Floristic composition of the above sites reveals maximum umber of species (39) on site III. The seasonal variation in secies composition shows greatest number of species during rainy season on all the three sites compared to winter and summer seasons. However, the number of species recorded was greatest on the site I during winter and on site II during the summer season. Total vegetation density, frequency, abundance, basal cover, relative frequenc, relative density, relative dominance and importance value index of individuals of the species have been worked out on all the three sites. Abundance/frequency (A/F) ratio of various species during the period of phytosociological study shows contagious distribution for most of the species. In vegetative composition the minor species being the major constituents contribute least towards the sociological sttributes. On all the sites the density of the minor species to the total density has not exceeded beyond 12.87% (on site III during rainy) and below 1.68% (on site III in winter). Similarly, the values of basal cover of the minor species to the total basal cover have shown only 17% (maximum) contribution on site I during rainy and 0.01% (mnimum) on site III during summer. The other attributes like relative frequency, relative density and relative dominance have also indicated less contribution on all the sites, i.e. 9.27-34.20%, 1.67-12.77% and 0.01-20.10% respectively.

1107. **Singh, V. 1971a.** "Comman grasses of Meerut". *Indian Forester* 97(5): 274–281.

Abstract: This study deals with the common grasses of Meerut with particular reference to an area of about 15 km in radius with Meerut college as the centre. A total of 82 species representing 50 genera have been listed from this area. Of these 26 genera and 44 species belong to the Panicoideae and 24 genera and 38 species of Pooideae. The Panicoideae is represented by all the three tribes, while the Poodeae by only 14 tribes.

1108. **Singh, V. 1971b.** "Addition to the Duthie's Flora of the Upper Gangetic Plain". *J. Bombay Nat. Hist. Soc.* 68(2): 339–346.

Abstract: In the present paper a list of all those plants which have so far been reported as new records for the Upper Gangetic Plain by various authors have been compiled.

1109. **Singh, V. 1987.** "The genus *Cassia* L. (Caesalpiniaceae)– Some new taxa and combinations from India". *J. Econ. Taxon. Bot.* 10(2): 321–327.

Abstract: Besides a new combination, two new species of *Cassia* L., viz., C. *davidsonii* Singh from Nainital, C. *nilgirica* Singh from Andhra Pradesh and Tamil Nadi and a variety C. *floribunda* Cav. var. *pubescens* Singh from Tamil Nadi are described with illustration.

1110. **Singh, V. & Gaur, R.D. 2013.** *Rangeland Ecosystem in the Himalayan Mountains.* Daya Publishing House, New Delhi.

1111. **Singh, V. & Singh, H. 1971 & 1972.** "A contribution to the flora of Gangolihat block in Pithoragarh district". *J. Bombay Nat. Hist. Soc.* 68(3): 773–790 & 69(2): 352–368.

Abstract: Three sixty six species of angiosperms and 2 species of gymnosperms representing 279 genera and 100 families have been recorded from Gangolihat block in Pithoragarh district.

1112. **Singh, V., Singh, R.K. & Gupta, S.L. 2015.** "Diversity of climbers, trailers and parasitic plants in Botanical Garden, Botanical Survey of India, central Regional Centre, Allahabad". *Indian J. Forest.* 38(2): 195–200.

Abstract: The present investigation deals with the diversity of climbers, trailers and parasitic plants in the botanical garden, Botanical Survey of India, Central Regional centre, Allahabad, U.P. There are 75 species under 61 genera belonging to 27 families. The climbers here discussed were cultivated (as some species of Cucurbits), wild and ornamental. The species were listed according to Bentham and Hooker's system of classification with their botanical name, family, habit, phenology and uses.

1113. **Singh, V.N. & Semwal, B.D. 2009.** "Herbaceous flora of Bakhira Birds Sanctuary, U.P. with special reference to wetland and medicinal plants". *J. Econ. Taxon. Bot.* 33(4): 915–932.

Abstract: Two hundred and tweve wetland species under 149 genera and 56 families have been recorded from Bakhira Bird Sanctuary, which is the first floristic ecord from this sanctuary situated in Sant Kabir Nagar district of Uttar Pradesh. Out of 212 species, 35 species are purely aquatic, 29 are semi-aquatic and remaining are terrestrial but grow in marshy conditions in various parts of the sanctuary. 92 species are found to be used medicinally by local pople. 90 species are also used for many other purposes like food, fodder and various commercial uses. The correct scientic names, local names, ecological notes, uses and medicinal importance have been provided in present communication.

1114. **Singh, V.P. & Srivastava, R.C. 2004.** "Checklist of Cyperaceae of Uttar Pradesh". *J. Econ. Taxon. Bot.* 28(2): 451–488.

Abstract: The paper presents an enumeration of the cyperaceous taxa of Uttar Pradesh. The sedge family (Cyperaceae) is represented in the state by 128 species belong to 17 genera as per the exploration records till date, from different localities of the state. Their nomenclature, diagnostic characters, phonological data and distribution are provided.

1115. **Singh, V.P. & Srivastava, R.C. 2007a.** "A census of the genus *Juncellus* C.B. Clarke (Cyperaceae) in Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 31(1): 1–4.

Abstract: The paper provides a detailed taxonomic account of 5 species of the genus *Juncellus* C.B. Clarke in Uttar Pradesh. Key to the species is also provided.

1116. **Singh, V.P. & Srivastava, R.C. 2007b.** "A census of the genus *Schoenoplectus* (H.G.L. Reichbach) Palla (Cyperaceae) in Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 31(1): 5–12.

Abstract: The paper provides a detailed taxonomic account of 10 species of the genus *Schoenoplectus* (H.G.L. Reichbach) Palla in Uttar Pradesh. Key to the species is also provided.

1117. **Singhal, R.M. & Sharma, S.D. 1981.** "Changes in bio-chemical composition of soil organic matter consequent upon growing *Eucalyptus* in sal zone of Doon valley". *Indian J. Forest.* 4(1): 45–48.

Abstract: Bio-chemical status of some sal forest soils of Dehra Dun was compared with the soil planted with *Eucalyptus*. The study reveals a greater transformation of litter under *Eucalyptus* than Sal with predominance of the constituents of plant tissues rather than the microbial activity on the resultant bio-chemical products in the soil.

1118. **Singhal, R.M., Rawat, V.R.S., Kumar, P., Sharma, S.D. & Singh, H.B. 1986.** "Vegetation analysis of woody species of some forests of Chakrata Himalayas– India". *Indian Forester* 112(9): 819–832.

Abstract: A detailed phytosociological analysis of woody species of Chakrata forest at twelve different sites supporting seven tree species viz., *Cedrus deodara, Pinus roxburghii, Picea smithiana, Pinus wallichiana, Quercus floribunda, Q. semicarpifolia* and *Abies pindrow* was carried out. Their total basal cover varied between 1455 and 5672 cm^2 100 m^{-2} and total density from 0.7 to 3.7 tree 100 m^{-2}. The distribution pattern was random for most of the species. The species diversity was greatest in *Pinus wallichiana* forests followed by *Quercus florinbunda* forests. However, the values of concentration of dominance, exhibited inverse relationship with the species diversity.

1119. **Sinha, B.K. 1990.** "Biological spectrum of Banda district, U.P.". *Geobios, New Rep.* 9: 143–146.

Abstract: Life forms and biological spectrum of banda district includes therophytes (39.93%), chamaephytes (20.83%), cryptophytes (11.48%), phanerophytes (14.64%), hemicryptophytes (7.32%), nanophytes (5.4%), lianas (8.08%), epiphytes, parasites and succulents (1.26%). The comparison with normal spectrum shows therophytic plant climate.

1120. **Sinha, B.K. 2005.** "Floristic diversity and vegetation composition of Lakh-Bahosi wetlands of Kannauj, Uttar Pradesh". *Phytotaxonomy* 5: 106–116.

Abstract: The floristic composition of wetland ecosystem of Lakh-Bahosi Bird Sanctuary of Kannuj district of Uttar Pradesh has been dealt with. The study reveals the occurrence of 242 species belonging to 177 genera and 61 families. Systematic enumeration of plant diversity along with economic uses has been provided. The wetland diversity has been fast deteriorating due to over-exploitation of biological resources by human population living around the lakes. Apart from tloristic composition and economic importance, a conservation strategy for the lakes has been discussed.

1121. **Sinha, B.K. & Dixit, R.D. 2000.** Floristic and ecological studies of Salon wetland, UP. In: *Prof. D.D. Nautiyal Comm. Vol. Recent Trends in Botanical research,* Botany Department, Allahabad University, Allahabad. Pp. 255–267.

1122. **Sinha, B.K. & Dixit, R.D. 2004.** "The floristic composition of Salon wetland, Uttar Padesh". *Bull. Bot. Surv. India* 46(1-4): 162–190.

Abstract: Wetlands are an important ecosystem in itself and also form an important life support systems for the flora and fauna. An extensive field survey and plant collection in Samaspur Bird Sanctuary (Salon wetlands) situated in Raibareli district of Uttar Pradesh reveals that 192 species belonging to 147 genera and 59 families have been gathered from the area. Out of them 13 families, 44 genera and 65 species are of monocot; 44 families, 101 genera and 125 species are of dicots and 2 families, 2 genera and 2 species are of pteridophytes. The systematic enumeration of plant species along with ecological notes, flowering and fruiting periods, and economic uses have been provided in each species. Besides, the floristic composition, the economic importance and conservation strategies have also been discussed.

1123. **Sinha, B.K. & Shukla, B.K. 2004.** "Floristic diversity of Bundelkhand region of Uttar Pradesh". *Bull. Bot. Surv. India* 46(1-4): 60–76.

Abstract: Floristic diversity of Bundelkhand region of Uttar Pradesh, comprising seven districts, viz., Chitrakut, Banda, Hamirpur, Mahoba, Jalaun and Lalitpur, has been outlined in the present communication. The area is deal for floristic survey because of its unique phytogeographical position as it lies in a transitional zone between the upper Gangetic plains and Vindhyan ranges of Central India. The vegetation mainly represents tropical dry deciduous forests, thorn forests and scrub forests with patches of *Boswellia, Butea, Anogeissus, Nyctanthes, Cochlospermum,* bamboos and grasslands. The floristic analysis reveals 1088 species belonging to 595 genera and 133 families of vascular plants. Poaceae (168 spp.) is the dominant family, followed by Fabaceae (138 spp.), Cyperaceae (60 spp.), Asteraceae (59 spp.) and Euphorbiaceae (44 spp.). A large number is species growing in his area are of medicinal and economic importance used by the local peoples. A brief account of area, topography, climatic conditions, vegetation types, medicinal and economic plants, analysis of flora, systematic enumeration of the genera and species and conservation measures, etc. have been discussed.

1124. **Sinha, B.K. & Verma, B.K. 1986a.** "Contribution to the flora of Banda district (U.P.)–II". *Indian J. Forest.* 9(4): 326–330.

Abstract: The paper gives an enumerative account of 53 species belonging to 40 genera of 27 families which are new additions to the flora of Banda district, Uttar Pradesh.

1125. **Sinha, B.K. & Verma, B.K. 1986b.** "Studies in sedge flora of Banda district, U.P.". *Proc. Natl. Acad.* Sci. *India* 56B (4): 359–377.

1126. **Sinha, B.K. & Verma, B.K. 1987.** Studies in sedge flora of Banda district (U.P.). Proc. Symp. Recent Adv. Pl. Sci., D.A.V. College, Dehra Dun. Pp. 58–83.

1127. **Sinha, B.K. & Verma, B.K. 1988.** "Family Amaranthaceae in Banda district (U.P.)". *J Econ. Taxon. Bot.* 12(1): 127–134.

Abstract: The present paper provides taxonomic account of 20 species belonging to 9 genera of the family Amaranthaceae from Banda district. Out of these 20 species, 10 species are being reported for the first time from the area under study. One of these belongs to genus *Achyranthes* which was not recorded earlier from this area. Two secies of rare distribution viz., *Alternanthera paronychoides* St.-Hill and *A. tenella*

Colla, are also being reported from this region. Artificial keys with short description have been provided for quick and easier identification.

1128. **Sinha, B.K. & Verma, B.K. 1992.** "Contribution to the flora of Banda district (U.P.)-III". *J. Econ. Taxon. Bot.* 16(1): 77–83.

Abstract: The paper gives an account of 59 species belonging to 52 genera and 35 families which are new additions to the Flora of Banda district.

1129. **Sinha, B.K. & Verma, B.K. 1996.** "Contribution to the flora of Banda District (UP) – II". *Indian J. Forest.* 9: 326–330.

Abstract: The paper gives an account of 53 species belonging to 40 genera and 27 families which are new additions to the Flora of Banda district.

1130. **Sinha, R.L. 1964.** "An excursion to Milam glacier". *Indian Forester* 90(12): 809–818.

Abstract: The note is an illustrated ininerary of an excursion to Milam glacier organised by the Botany Department of Lucknow University in 1938. Thw riter was one of the members of the party. It describes briefly the route of Milam glacier, the topography, the vegetation and fauna of the tract. A route map is also appended.

1131. **Sinha, S. 1951.** "The vegetation of glacial moraines of the Pindari glacier, Kumaon". *Proc. Natl. Acad. Sci., India* Sec. B.: *Biol. Sci.* 21: 91–98.

1132. **Smythe, F. S. 1938.** *The Valley of Flowers.* Hodder & Stoughton Ltd., London.

1133. **Sodhi, S. (Ed.). 2013.** *Uttarakhand Nature Handbook-A Guide for Naturalists, Eco-tourists and Students.* Ecotourism Wing, Forest Department, Uttarakhand and Bishen Singh Mahendra Pal Singh, Dehradun.

1134. **Sonam, Kumar, B., Arya, V. & Arya, M.K. 2017.** "Vegetation analysis and regeneration status of Sauni-Binsar sacred natural forest, Ranikhet (Kumaun Himalaya)". *Int. J. Bot. Stud.* 2(5): 16–20.

Abstract: Present study aims to assess community structure and regeneration status of Sauni-Binsar sacred natural forest of Kumaun Himalaya (1500 – 2200 m asl). A sum of 30 sampling quadrats of 10 m x 10 m size was placed randomly in the sacred grove. The grove was categorized into three zones- hill base, hill slope and hill top. Circumference at breast height of tree species was measured and their individual number was counted within the sampling quadrats. Various phytosociological attributes such as density, frequency, abundance, Importance Value Index, diversity indices and regeneration status of tree species were analyzed. Tree density ranged from 265 and 375 Ind. ha^{-1}. *Cedrus deodara* (Roxb.) G. Don was recorded as dominant tree species with the highest IVI of 84.6 at hill base while *Quercus leucotrichophora* A. Camus was dominant species at hill slope (93.4 IVI) and hill top (125.9 IVI). Shannon-Weaver diversity index (H) ranged from 1.05 to 1.34. In the hill base overgrazing by cattle, pine tree cutting for timber; resin extraction; frequent forest fire in summer was observed that led to no regeneration and forest degradation. Various anthropogenic activities such as overgrazing, resin extraction, fodder and fuel wood collection, forest fire should be controlled by imparting knowledge among local communities regarding sustainable utilization of forest resources with the help of forest department.

1135. **Soni, P., Kumar, O. & Vasishtha, H.B. 1984.** "Community structure and biomass production in a northern tropical dry mixed deciduous forest of east Dehra Dun Division". *Indian Forester* 110(9): 954–957.

1136. **Srivastava, A.K. 1993.** "Exotic weeds of Gorakhpur district, U.P.". *J. Econ. Taxon. Bot.* 17(2): 261–263.

Abstract: The present paper enumerates 24 exotic weeds having common occurrence and wide distribution alongwith their country or origin and local habitats. The study revealed that out of 24 plant species, 23 species have their origin from the New World whereas one species from West Africa.

1137. **Srivastava, A.K., Dixit, S.N. & Singh, S.K. 1987.** "Aquatic angiospenns of Gorakhpur". *Indian J. Forest.* 10(1): 46–51.

Abstract: The present paper deals with an investigation of aquatic angiosperms of Gorakhpur district. Geography and ecological classification of species alongwith phenology and field number are dealt with. In all, 125 species representing 77 genera and 41 families have been recorded.

1138. **Srivastava, G.D. 1938.** "Flora of Allahabad". *Allahabad Univ. Stud.* 14: 87–133, 15: 51–127.

1139. **Srivastava, G.D. 1949.** "Flora of Allahabad Supplement 1". *Allahabad Univ. Stud.* 1–20.

1140. **Srivastava, J.G. 1955.** "A note on the flora of Mirzapur (U.P.)". *J Bombay Nat. Hist. Soc.* 53: 152–153.

1141. **Srivastava, J.G. 1963.** "Forty seven more grasses from Lucknow". *J. Bombay Nat. Hist. Soc.* 60(2): 484–488.

Abstract: Forty seven species of grasses has been reported from Lucknow.

1142. **Srivastava, M., Kumar, A. & Hussain, T. 2015.** "Diversity of angiospermic plants in Dhanaulti region, Uttarakhand: An emerging tourist destination in Western Himalaya". *Check List* 11(4): 1702–1710.

Abstract: Situated adjacent to Mussoorie, the popular hill station in Uttarakhand state of India, Dhanaulti region is known for its scenic environs amidst the temperate forests. The floristic survey revealed a total of 112 species belonging to 96 genera and 47 families. Poaceae was the largest family with 16 genera and 17 species followed by Rosaceae represented by nine genera and 13 species and Asteraceae with eight genera and eight species. Lamiaceae and Caprifoliaceae had four species each while Brassicaceae, Celastraceae, Cyperaceae, Fabaceae, Orchidaceae, Plantaginaceae and Smilacaceae had three species each. Most dominant genus was *Rubus* with four species followed by *Euonymus* and *Smilax* with three species each. Two vulnerable species, *Bergenia ciliata* (Haw.) Sternb. and *Valeriana jatamansi* Jones, were also recorded. This study in addition gives an account on ethnobotanical uses of 51 species. Since Dhanaulti is an emerging tourist destination in Western Himalaya, the study will generate baseline information for management authorities to give due importance to its ecological wealth while planning any development in future.

1143. **Srivastava, M.M. 1979.** "Autecological observations on *Sporobolus coromandelianus* (Retz.) Kunth". *Indian J. Forest.* 2(2): 165–168.

Abstract: This paper presents autecological observations on *Sporobolus coromandelianus*. It is a dominant species on saline and alkaline lands of Varanasi. The seed germination studies have shown that freshly collected seeds are dormant and with the lapse of time dormancy is decreased. This species is capable of germination in the presence of NaCl upto one percent concentration showing thereby the ability of the plant to grow on saline and alkaline areas. The reproductive capacity and plant analysis have also been studied and discussed.

1144. **Srivastava, M.M. & Ghildiyal, J.C. (1995) 1996.** Flora of Manu swamp: A subtropical freshwater swamp forest at Rhishikesh (Dehra Dun) U.P. In: Gupta, B.K. (Ed.) *Higher plants of Indian Subcontinent [Indian J Forest.,* Addl. Ser.] 5: 159-195. Bishen Singh Mahendra Pal Singh, Dehradun.

1145. **Srivastava, M.M., Srivastava, P.K. & Kukreti, U.D. 1981.** "Biological spectrum of a marshy grassland at Rajpur, Dehra Dun (U.P.), India". *Indian J. Forest.* 4(3): 220–223.

Abstract: In India several workers have worked out the biological spectra of a number of places, but no work on marshy grassland life forms is on record. In the present grassland various life form classes, i.e. chamaephyte, hemicryptophyte, cryptophytes and therophyte were represented by respectively 2, 24, 2 and 24 species. A comparison of the biological spectrum given by Raunkiaer (1934) and that of the study site indicates the following: (1) the percentage of therophytes and hemicryptophytes are higher on the present site, and (2) the percentage of chamaephytes and cryptophytes are lower. Since the present grassland shows the dominance of hemicryptophytes and therophytes, the flora may be called therohemicryptophytic.

1146. **Srivastava, R.K., Khanduri, V.P., Sharma, C.M. & Kumar, P. 2005.** "Structure, diversity and regeneration potential of oak dominant conifer mixed forest along an altitudinal gradient in Garhwal Hirnalaya". *Indian Forester* 131(12): 1537–1553.

Abstract: Temperate forest structure, species composition, dispersion, diversity and regeneration behaviour in relation to the physico-chemical properties of soil were studied in the Oakmixed coniferous forest in a part of Garhwal Himalaya during the year 2000. The study indicated that the total density and basal cover values in the tree layer varied from 630 to 1,590 stems/ ha and 20.04 to 82.51 m^2/ha respectively. The maximum number of saplings and seedlings (520 and 720 stems/ha respectively) were observed on the highest altitude (2,100m asl), whereas, the minimum number of saplings and seedlings (200 and 100 stems/ha respectively), on the lowest altitude (1600m asl). The study further revels that the moist temperate forest is characterized by a patchy distribution of species and individuals with mixed species composition and the sites are represented by different dominants and codominant species. The values of diversity and concentration of dominance oscillated between 1.33 to 2.01 and 0.27 to 0.45, respectively. Physico- chemical properties of soils were found to be promising for the growth of forest. Availability of higher average organic carbon and nitrogen contents might have given birth to higher total basal cover values on 1,700m and 1,800m altitudes, whereas, lesser prevalence of these parameters on 1,900m and 2,000m altitudes apparent to lower total basal cover values.

1147. **Srivastava, S.K. 2004.** "Floristic diversity in Uttar Pradesh– An overview". *J. Econ. Taxon. Bot.* 28(2): 292–334.

Abstract: This article includes the state of art, vegetation type, floristic composition, ethnobotanical studies, medicinal plant resources of angiospermic flora beside the status of Algae, Fungi, Lichens, Bryophytes (Liverworts) and Pteridophytes in respect of Uttar Pradesh state.

1148. **Srivastava, S.K. & Pusalkar, P.K. 2015.** "Lectotypification and new locality report for monotypic and critically endangered genus *Catamixis* (Asteraceae: Pertyoideae: Pertyeae)". *Nelumbo* 57: 11–18.

Abstract: *Catamixis baccharoides* Thomson, a narrow range endemic species of a monotypic genus *Catamixis* Thomson (Asteraceae: Pertyoideae: Pertyeae) found in India and Nepal, is lectotypified. Detailed morphotaxonomic characterization and updated distribution range is provided for the first time with a new locality record for this critically endangered species.

1149. **Srivastava, S.K. & Shukla, A.N. 2015.** *Flora of Cold Desert, Western Himalaya,* Vol. 2. Botanical Survey of India, Kolkata.

1150. **Srivastava, S.K. & Singh, D.K. 2005.** *Glimses of the Plant Wealth of Uttaranchal.* Bishen Singh Mahendra Pal Singh, Dehradun.

1151. **Srivastava, S.K., Pusalkar, P.K. & Shukla, A.N. 2011.** Post-Impoundment Floristic Survey and Analysis of Tehri Dam Environs - Technical EIA Report. Botanical Survey of India. Dehradun.

1152. **Srivastava, S.K., Upadhyay, G.K. & Krishna, G. 2010.** "Taxonomic notes on Indian species of *Anisadenia* (Linaceae)". *J. Jap. Bot.* 85: 358–363.

Abstract: Further revision of *Anisadenia* Wall, ex Meisn. (Linaceae: tribe Eulineae Hook, f.) is presented. This includes correction in the designation of lectotype for *A. saxatilis* Wall. ex Meisn. and *A. pubescens* Griff. and further notes on the delimitation for both species with a revised key.

1153. **Srivastava, T.N. 1976.** *Flora Gorakhpurensis.* Today & Tomorrow's Printers & Publishers, New Delhi. Pp. 411.

1154. **Srivastava, V.K. 1986.** "Diversity and dominance in two man-made forests at Dehra Dun, India". *Indian J. Forest.* 9(4): 287–292.

Abstract: Tree species diversity and their dominance was measured in chir (*Pinus roxburghii*) and teak (*Tectona grandis*) plantations. In chir plantation besides chir, *Cinnamomum camphora, Mallotus philippensis* and *Michelia champaca* were co-dominants. In teak plantation besides teak, *Lallotus philippensis, Albizia lebbeck* and *Syzygium cumini* were co-dominants. An inverse correlation between dominance concentration and species diversity was found. Inverse correlation between basal area and dominance was noted in chir plantation.

1155. **Steam, W.T. 1960.** "*Allium* and *Milula* in the Central and Eastern Himalaya". *Bull. Brit. Mus. Nat. Hist.* 2: 161–191.

1156. **Stewart, R.R. 1942.** *The Flora of Mussoorie.* Proceedings of Indian Science Congress Association, Part III, Abstracts 126–127.

1157. **Suyal, S., Sharma, C.M., Gairola, S., Ghildiyal, S.K., Rana, C.S. & Butola, D.S. 2010.** "Phytodiversity (Angiosperms and Gymnosperms) in Chaurangikhal forest of Garhwal Himalaya, Uttarakhand, India". *Indian J. Sci. & Technol.* 3(3): 267–275.

Abstract: We report the phytodiversity richness of the moist temperate Chaurangikhal forest of Garhwal Himalaya, Uttarakhand, India. We recorded a total of 231 species (227 angiosperms and 4 gymnosperms) belonging to 69 families (67 angiosperms and 2 gymnosperms) and 159 genera (156 angiosperms and 3 gymnosperms). The dicotyledones and monocotyledones were represented by a total of 62 and 5 families, respectively. In the study area, the ratio of family to genus was 1: 2.3, family to species was 1: 3.35 and a genus to species was 1: 1.45. Among all the species recorded the 88.31% (204 spp.) of the total species had common occurrence, whereas rest 11.69% (27 spp.) of the species had uncommon occurrence in the study area. The 10 dominant families of the study area were Lamiaceae, Asteraceae, Rosaceae, Ranunculaceae, Fabaceae, Caryophyllaceae, Polygonaceae, Rubiaceae, Gentianaceae and Poaceae. This data may be useful for biodiversity managers and for optimal utilization of plant resources.

1158. **Tayal, M.S. & Bhasin, Lalitha. 1970.** "Additional notes on the flora of Muzaffarnagar (U.P.)". *Bull. Bot. Surv. India* 12(1-4): 203–207.

Abstract: The present paper deals with details of the new plants records from Muzaffarnagar. A list of the plants described by the earlier author (R.K. Gupta, 1961) and not obtained afterwards is also given. Sixty six species belonging to 24 families have been given in this paper. The families have been arranged according to the system of Bentham & Hooker, adopted by Duthie (1903-1929) and Hooker (1872-1897).

1159. **Tewari, J.C. 1982.** *Vegetational Analysis along Altitudinal Gradient around Nainital.* Ph.D. Thesis. Kumaun University, Nainital. (unpublished)

1160. **Tewari, J.C. & Singh, S.P. 1982.** Vegetation analysis of a forest lying in transitional zone between lower and upper Himalayan moist temperate forests. In: Paliwal, GS. (Ed.), *The Vegetational Wealth of the Himalayas.* Puja Publ., New Delhi. Pp. 104–119.

1161. **Tewari, J.C. & Singh, S.P. 1985.** "Analysis of woody vegetation in a mixed oak forest of Kumaun Himalaya". *Proc. Indian Natl. Sci. Acad., Bot.* 51(3): 332–347.

Abstract: Woody species composition and structural features of tree species of an oak forest of Kumaun Himalaya are described. *Quercus lanuginose* and *Q. semecarpifolia* were dominant along with other oak species. The diversity was generally higher for saplings than for trees. Among the dominants *Q. semecarpifolia* showed poor regeneration, whereas, *Q. lanuginose* and *Q. floribunda* were frequent reproducers. The stands ordinate on the basis of species composition, appeared to be organised on a gradient of least mesic to the mesic conditions. The stands were more similar when structural features of species were considered than when species composition was considered.

1162. **Tewari, K.C. 2006.** "Cultivation of saffron– A medicinal plant in non-habitat area of U.P. Himalaya". *J. Econ. Taxon. Bot.* 30(3): 737–742.

Abstract: Saffron (*Crocus sativus* L.) is ahighly medicinal plant with revenue potential. It is a denizen of Kashmir Himalaya. To meet the demad of present World, it is being cultivated in N.W. Himalaya. Since production fails to keep pace with demand, the natural populations face the greed and need of people at their survival cost. As such, this taxon has come under hreat throughout its range of distribution. Its conservation, multiplication and extention of cultivation in other areas of identical ecological niche is most necessary. The present paper deals with the results of experiments conducted regarding its conservation through cultivation in Uttar Pradesh Himalaya.

1163. **Tewari, L.M., Pangtey, Y.P.S. & Tewari, G. (Eds.). 2010.** *Biodiversity Potential of the Himalaya*. Gyanodaya Prakashan, Nainital.

1164. **Tewari, S.C. & Paliwal, G.S. 1982.** Ecological problems in Garhwal Himalaya. In: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalayas*. Puja Publ., New Delhi. Pp. 122–132.

1165. **Tiwari, D., Upadhyay, S. & Paliwal, A. 2016.** "Diversity of weed flora of Bharsar, Pauri Garhwal (Uttarakhand), India". *IOSR J. Agric. & Veterinary Sci.* 9(11): 1–9.

Abstract: Uttarakhand is a hill state, situated in central Himalaya. It differs from the plains in topography, elevation, geographic features, ethnic diversity, land use system, socio-economic conditions and diversity of habitats for flora and fauna. Among the diversity of habitats for flora, weeds cause enormous reduction in crop yield, wastage of resources and human energy and are also a health hazard to human being. Therefore, adequate and timely suppression of weeds is essential. Detail information about the weeds of any region is essential for deciding a weed control method. To study the diversity of weed flora in Bharsar region for weed identification purpose a field survey was conducted from 2012 to 2015 in a different blocks namely Medicinal and Aromatic Plants; Floriculture and Land Architecture; Potato Farm, Apple Orchard, Tea, Organic, Vegetable, Kiwi, Farm of Krishi Vigyan Kendra and Fruit Nursery under College of Horticulture, VCSG Uttarakhand University of Horticulture, Bharsar, Uttarakhand. This extensive field survey revealed that the more than 100 weeds were present in this region. Among all, weeds from two family viz. Asteraceae and Poaceae were found dominant.

1166. **Tiwari, J.K., Tiwari, P. & Rawat, D.S. 2015a.** "Some additions to Orchidaceae of district Chamoli, Uttarakhand". *Indian Forester* 142(8): 797–798.

Abstract: Four species of orchids viz., *Dendrobium moniliforme* (L.) Sw., *Goodyera biflora* (Lindl.) Hook.f., *G. viridiflora* (Blume) Blume and *Crepidium biaurita* (Lindley) Szlachetko have been recorded for the first time for Chamoli district of Uttarakhand.

1167. **Tiwari, J.K., Tiwari, P. & Rawat, D.S. 2015b.** "Some additions to flora of Chamoli". *Phytotaxonomy* 15: 146–151.

Abstract: The authors conducted floristic explorations in southern part of district Chamoli during 2011-2014. Critical examination of voucher specimens resulted in addition of 20 species as new records to flora of Chamoli.

1168. **Tiwari, P., Rautela, B., Rawat, D.S. & Singh, N. 2020.** "Weed floristic composition and diversity in paddy fields of Mandakini valley, Uttarakhand, India". *Int. J. Bot. Stud.* 5(3): 334–341.

Abstract: Weeds are one of the most challenging threats faced by agricultural lands and impart severe effect on crop yield thus impose a high cost to agriculture. The present study was made to characterize the weed communities associated with paddy fields of Mandakini valley, Uttarakhand. Field data was collected by quadrat method (size 1 m^2) through field surveys in the year 2017-2018. A total of 57 weed species belonging to 45 genera and 19 families were recorded from the paddy fields. *Echinochloa colona, Cyperus iria* and *Ageratum conyzoides* are the most problematic weeds prevailing the paddy fields of the study area. The alpha diversity indices showed that Site 3 was the most diverse zone. High value of Sorenson index represented close similarity occurred in weed species in all the comparison between the sites. The Steinhaus coefficient demonstrated highest similarity intensity between Site 1 and Site 3.

1169. **Tiwari, S.C. & Gupta, S.K. 1982.** Grassland ecology of Garhwal Himalayas with special reference to microclimate and phytosociology. In.: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalayas.* New Delhi. Pp. 133–157.

1170. **Tiwari, U.L., Adhikari, B.S. & Rawat, G.S. 2012a.** "A checklist of Berberidaceae in Uttarakhand, Western Himalaya, India". *Check List* 8(4): 610–616.

Abstract: In India, Berberidaceae is represented by three genera and 68 species. The largest among genera is *Berberis* (55 species). Majority of Berberidaceae members are distributed in the Himalayan region. Only four species are found away from the Himalayan region, i.e., Nilgiri hills, Chhota Nagpur and Pachmarhi hills of Madhya Pradesh. Extensive surveys were conducted in various ecoclimatic zones of Uttarakhand between years of 2008 and 2010. For each species encountered, field notes were taken along with the voucher specimen following standard technique. During field survey, field notes, date, locality, habitat and brief identification features were noted. A checklist of 36 taxa of Berberidaceae recorded from the state of Uttarakhand, India, is provided. Of these, 32 belong to genus *Berberis* and four belong to genus *Mahonia*. The present study shows that *Berberis hamiltoniana* Ahrendt and *Berberis apiculata* Ahrendt are new records for Uttarakhand state. *Berberis lambertii* Parker has been rediscovered after a century gap. Nomenclature has been updated as far as possible with the help of available recent taxonomic literature.

1171. **Todaria, N.P., Saklani, K.P. & Sachan, M.S. 2004.** "Variation in pod and seed characteristics of *Acacia catechu* Willd. in Garhwal Himalayas". *Indian Forester* 130(1): 53–61.

Abstract: Variations with respect to different pod and seed morphological characters of *Acacia catechu* collected from different sources in Garhwal Himalayas (Uttar Pradesh, India) were studied. Significant inter-genotypic differences were recorded for all the pod and seed characteristics, viz., total number of seeds/pod, healthy and damaged seeds/pod, seed length, width, thickness and seed weight. Except for

damaged seeds/pod and seed width, the heritability (h^2) values were higher than 75% while low genetic advance was observed in all characters. A number of traits were found to have interrelationship at varying levels of significance.

1172. **Tomar, A. 2009.** "Common grasses of Baghpat district, Uttar Pradesh, India". *J. Non-Timber Forest Prod.* 16(2): 145–150.

Abstract: In the present paper 41 grass species belonging to 30 genera collected from Baghpat district are enumerated.

1173. **Tomar, A., Singh, H. & Singh, V. 2008.** "Exotic elements in the flora of Baghpat district, Uttar Pradesh". *Indian. J Forest.* 31(3): 463–471.

Abstract: In the present paper 76 exotic angiospermic plant species belonging to 34 families and 67 genera have been enumerated from Bagpat District, with focus on their origin, habit form, distribution, habitat and locality. 9.05% flora is exotic in Bagpat District. 44.74% (34 out of 76 species) exotic plants com from America alone. The maximum number of exotic plants (9 species belongs to the family Euphorbiaceae).

1174. **Tomar, A., Manhas, R.K., Srivastava, R.K. & Vasistha, H.B. 2014.** "Fruit and seed characters of some valuable lesser known plants of Uttarakhand Himalayas". *Ann. Forest.* 22(2): 189–194.

Abstract: In the present study, fruit and seed characteristics of *Gentiana kurroo*, *Berberis aristata* and *Carpinus viminea*, three lesser known but valuable species, were studied. These species are gradually disappearing from the forests although they have a good potential for commercial value, There is a great need to reforest them to sustain the genepool of these lesser known species in their natural habitats by developing suitable interventions for their nursery and plantation technology, The average size of fruit of *G. kurroo* was 4.7 x 0.8 mm^2, of *B. aristata* 7.3 x 4.0 mm^2 and *C. viminea* was 4.4 x 3.2 mm^2. The average seed size for *G. kurroo, B. aristata* and *C. viminea* was 1.17 x 0.22 mm^2, 3.7 x 1.6 mm^2 and 3.7 x 2.8 mm^2, respectively.

1175. **Tomar, A., Singh, S.M., Pandey, B.K., Shukla, M.K. & Chandra, V. 2013.** "Floristic diversity of Meja Thermal Power Plant (MTPP) at Allahabad, Uttar Pradesh". *Ann. Forest.* 21(1): 68–76.

Abstract: A study was conducted at Allahabad during 2011-2012 to collect information about floristic diversity at Meja Thermal Power Plant site within 10 km radius at an elevation above msl 340 to 364 ft. The study area was divided into six zones viz., Core, Buffer, North, South, East and West. The total number of 150 species (24 trees, 19 shrubs, 107 herbs) belonging to 52 families were recorded. Species conducted in Core Zone were (51), Buffer (57), North (69), South (72), East (59) and West (60). The study illustrates the rich herbal diversity of the area.

1176. **Trevedi, B.S. & Sharma, P.C. 1965.** "Studies on the hydrophytes of Lucknow and its environs". Proc. *Natl. Acad.* Sci., *India* 35: 1–14.

1177. **Turner, J.E.C. 1929.** "West Almora Division, UP". *Indian Forester* 55(11): 578–586.

1178. **Uniyal, A. & Uniyal, S.K. 2008.** Distribution, status and conservation of *Picrorhiza kurrooa* in the Himalayan region. In: Rawat, G.S. (Ed.), ENVIS Bulletin- *Special Habitats and Threatened Plants of India.* Wildlife Institute of India (WII), Dehra Dun. Pp. 55–61.

1179. **Uniyal, A., Rawat, G.S. & Uniyal, S.K. 2011.** "Extraction of *Picrorhiza kurrooa*". *Curr.* Sci. 100: 1606.

1180. **Uniyal, A., Uniyal, S.K. & Rawat, G.S. 2009.** "Status and extraction pattern of *Picrorhiza kurrooa* Royle ex Benth. (Kutki) in alpine meadows of Western Himalaya". *Indian J. Forest*. 32(4): 569–574.

Abstract: Population and biomass availability of *Picrorrhiza kurrooa* was assessed in Gori, Ralam (Uttarakhand) and Uhl valleys (Himachal Pradesh) of Western Himalaya using stratified random sampling. For density estimation 1 x 1 m^2 quadrates were laid and for biomass quantification harvest technique was followed. Highest density (11.3 individuals/m^2), frequency (76.11%) and biomass (68.14g/m^2) were found in Gori valley, while Ralam valley had the least density, frequency and biomass. Patterns and processes of kutki extraction by the local people have been discussed in the light of its conservation. In the process few important localities have been identified in each valley for the conservation and long term monitoring of kutki.

1181. **Uniyal, B.P. 2010.** Diversity in the Grasses of Uttarakhand. In: Uniyal, P.L., Chamola, B.P. & Semwal, D.P. (Eds.), *The Plant Wealth of Uttarakhand*. Jagadambica Publishing Co., New Delhi. Pp. 327–338.

1182. **Uniyal, B.P. & Malhotra, C.L. 1982.** Economic exploitation of rare North-Western Himalayan plants. In: Paliwal, G.S. (Ed.) *The Vegetational Wealth of the Himalayas*. Puja Publishers, New Delhi. Pp. 221–225.

1183. **Uniyal, B.P. & Rao, R.R. 1993.** "Vegetation and flora of Rajaji Sanctuary in Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 17(1): 1–30.

Abstract: The present paper deals with the vegetation and flora of Rajaji sanctuary situated in the Siwalik Forest Division of U.P. A total number of 360 species belonging to 235 genera under 77 families have been enumerated with up to date nomenclature and citation followed by habit, flowering and fruiting period and details of collection.

1184. **Uniyal, B.P., Balodi, B. & Nath, B. 1994.** "*Grasses of Uttar Pradesh -A Checklist*". Bishen Singh Mahendra Pal Singh, Dehradun.

1185. **Uniyal, B.P., Khanna, K.K. & Balodi, B. 1999.** Uttar Pradesh. In: Mudgal, V. & Hajra, P.K. (Eds.), *Floristic Diversity and Conservation Strategies in India,* Vol. 3: 1529–1574. Botanical Survey of India, Calcutta.

1186. **Uniyal, B.P., Singh, S. & Singh, D.K. 1995.** *Plant Diversity in Tehri Dam Submersible Area*. Botanical Survey of India, Calcutta.

1187. **Uniyal, B.P., Sharma, J.R., Choudhary, U. & Singh, D.K. 2007.** *Flowering Plants of Uttarakhand [A Checklist]*. Bishen Singh Mahendra Pal Singh, Dehradun.

1188. **Uniyal, P., Pokhriyal, P., Dasgupta, S., Bhatt, D. & Todaria, N.P. 2010.** "Plant diversity in two forest types along the disturbance gradient in Dewalgarh watershed, Garhwal Himalayas". *Curr. Sci.* 98: 938–943.

Abstract: This study deals with the plant diversity and effects of disturbance on two types of forest namely, Anogeissus latifolius mixed forest (700-1200 m asl) and Quercus leucotrichophora forest (1500-2200 m asl) in Dewalgarh Watershed in Pauri District of Uttarakhand. Undisturbed, moderately disturbed and highly disturbed stands were identified within both types of forest of the watershed on the basis of canopy cover percentage, tree density ha-1 and cut stumps analysis. For Q. leucotrichophora forest, the undisturbed forest stand had canopy cover > 60%, cut stump index < 2 and 2144 trees ha-1, whereas the highly disturbed stand had canopy cover <49%, cut stump index > 7 and 804 trees ha-1. For A. latifolius mixed forest, the undisturbed forest stand had canopy cover > 45%, cut stump index < 2 and 1275 trees ha-1, whereas the highly disturbed stand had canopy cover < 38%, cut stump index > 7 and 845 trees ha-1. The moderately disturbed stand occupied the intermediate position with respect to these parameters for both types of the forest. The study showed that the moderately disturbed stand favoured density and species richness in both the forest types. The Margalef index, Shannon diversity index and evenness index exhibited a similar trend, the highest value in moderately disturbed stand and lowest in highly disturbed stand. A sharp decline was recorded in tree density and basal area with increasing disturbance magnitude in both types of forests.

1189. **Uniyal, P.L., Chamola, B.P. & Semwal, D.P. (Eds.) 2010.** *The Plant Wealth of Uttarakhand*. Jagdambica Publishing Co., New Delhi.

1190. **Uniyal, S.K. 2001.** *A Study on the Structure and Composition of Forests along an Altitudinal Gradient in Upper Bhagirathi Catchment, Garhwal Himalaya*. Ph.D. Thesis, Forest Research Institute Deemed University, Dehradun. (unpublished)

1191. **Uniyal, S.K., Swami, A. & Uniyal, B.P. 1997.** *Cyperaceae of Uttar Pradesh– A Checklist*. Bishen Singh Mahendra Pal Singh, Dehradun.

1192. **Uniyal, S.K., Swami, A. & Uniyal, B.P. 1999.** *Monocotyledonous Plants of Uttar Pradesh (excluding Cyperaceae and Poaceae) – A Checklist*. Bishen Singh Mahendra Pal Singh, Dehradun.

1193. **Upadhyay, R. & Chauhan, S.V.S. 2001.** "A note on recent introduction of some exotics and overlooked species in the flora of Agra". *Ann. Forest.* 9(1): 36–38.

Abstract: The present paper reports the addition of eleven species belonging to nine families recorded for the first time from district Agra (Uttar Pradesh). Five of these are exotics escapes, while one is an exotic weed. The other five are reminiscent of forest communities dominating the area in the recent past.

1194. **Upreti, K., Tewari, L.M., Pangtey, Y.P.S. & Jalal, J.S. 2010.** Diversity and distribution of wild edible fruit plants of Uttarakhand. In: Tewari, L.M., Pangtey, Y.P.S. & Tewari, G. (Eds.), *Biodiversity Potential of the Himalaya*. Gyanodaya Prakashan, Nainital. Pp. 157–196.

1195. **Upreti, N., Tewari, J.C. & Singh, S.P. 1985.** "The Oak forests of the Kumaun Himalaya (India): Composition, diversity and regeneration". *Mount. Res. & Develop.* 5(2): 163–174.

Abstract: Eighteen forest stands dominated by oak (*Quercus*) species at elevation from 1200 to 2400 m in the Kumaun Himalaya were analysed for community organisation, size class distribution and regeneration status. The total basal area of trees in some of the forests was comparable with the highest values recorded from elsewhere in the temperate zone. *Quercus floribunda* showed preference for more mesic aspects than Q. *leucotrichophora*. Of the two high-altitude oak species, Q. *semicarpifolia* preferred the hill tops and Q. *lanuginose* the hill slopes. The shrub

density was inversely related to the density of conifer species. *Arundinaria falcate* was the most dominant shrub under the undisturbed oak forests. The index of diversity was greatest in the lower part of altitudinal transect, in the chir pine-banj oak forest. Severe biotic disturbance and the resultant harsh physical environment has inhibited the regeneration of Q. *leucotrichophora*. Q. *floribunda* produces seedlings and saplings in abundance even where density is low. In the highest stands while Q. *lanuginose* renerated frequently, the regeneration of Q. *semecarpifolia* was poor.

1196. **Upreti, P., Punetha, N., Datt, B. & Rana, T.S. 2010.** "Studies on diversity and distribution of weeds in Eastern Kumaun region, Uttarakhand". *Ann. Forest.* 18(1): 91–110.

Abstract: Weeds and alien plants are very important components of Himalayan ecosystem. In the mountainous region like eastern Kumaun studies on weed flora are very important since hill crops are more prone to the infestation of weeds from surrounding unused waste areas and terraces of fields, resuting in enormous richness and diversity in the weed flora. These weeds not only compete with crop plants and suppress yield, but also displace several native species, causing considerable damage to natural landscape and ecosystem functioning. On the other end of spectrum they play an important ecological role in maintaining soil fertility apart from their economic and other values. Control and management of weeds has inevitably become a major problem in agriculture and biodiversity conservation. Therefore, studies on weed flora along with impact assessment of invasive weeds on native flora are prerequisite for effective control of weeds and conservation of biodiversity of any region. The present contribution is a part of the comprehensive study carried out on the weed flora of eastern Kumaun region of Uttarakhand state and deals with 168 weed species grown on the terraces or along the terrace margins and waste corners of cultivated fields. Each species is provided with a legitimate botanical name, followed by basionym as well as important synonym(s), if any, common name(s) wherever available, habit phenology, local uses and voucher number(s).

1197. **Uttarakhand Forest Department. 2013.** *Uttarakhand Forest Statistics.* Uttarakhand Forest Department, Dehradun.

1198. **Vaid, K.M. 1967.** "*Taxodium mucronatum*– One of the fastest growing conifer in Doon". *Indian Forester* 93(5): 297–298.

Abstract: *Taxodium mucronatum* is an exotic conifer of Mexican origin which is a long-lived, fast growing tree, inhabiting wet soils along stream banks and attaining enormous girth of the trunk. Its performance as a successful introduction in Dera Dun has been very commendable and has stood the test of the time. It seems to satisfy practically all the essentials for choosing a fast growing species- it is well suited to the conditions of soil and climate and the growth is healthy and vigorous with a good survival value. Its potential as a raw material for paper industry has been suitably assessed and the results compare favaourably with the chir pine (*Pinus roxburghii*).

1199. **Van, Do T. & Wanke, S. 2015.** "Taxonomic notes on *Aristolochia dilatata* Brown from India: Lectotypification and a new synonym". *Bangladesh J. Bot.* 44(3): 455–458.

Abstract: *Aristolochia gourigangaica* Nair is proposed here as a synonym of *Aristolochia dilatata* Brown. Furthermore, the lectotype of *Aristolochia dilatata* is designated. Its relationship with *Aristolochia punjabensis* is also discussed.

1200. **Varshney, C.K. 1971.** "Observation on the Varanasi wall flora". *Vegetatio* 22: 355–372.

Abstract: This study deals with the ecology of a man-made habitat, i.e., old walls and buildings of Varanasi, India. The wall flora of Varanasi includes 135 species of angiosperms, 1 species of pteridophyte, 4 species of bryophytes and one species of lichen. Abundant wall plants like *Arthraxon lancifolius, Lindenbergia polyantha, Aristida funiculata* and lichens are never seen off the walls. The vegetation of the three types of walls, viz., brick mortar, brick mud and mud walls, classified according to the materials of construction, show sharp differences, despite many common features. Analysis of the wall flora, according to Raunkiaer's life-form system, revealed a marked contrast from the adjoining ground flora in having a very high percentage of therophytes. It is concluded, that the distinctiveness of the wall flora is due to the unique topography, microclimate and xeric nature of the wall habitat. Differences in the physico-chemical nature of the three types of walls are responsible for the variation in their vegetation.

1201. **Venkatareddi, B. 1969a.** "Some additions to the flora of Mirzapur district". *Bull. Bot. Surv. India* 11(3&4): 438–440.

Abstract: Forty six species belongs to28 families have recorded for the first time for the flora of Mizrapur district. *Ceropegia hirsuta* Wight & Arn. and *Elatostema cuneatum* Wight form new records for the Upper Gangetic plain.

1202. **Verma, B.K. 1973.** "Further studies in the flora of Allahabad". *Curr. Sci.* 42(9): 331.

1203. **Verma, B.K. & Misra, B.K. 1979.** "Additions to the flora of Allahabad district (U.P.)". *Bull. Bot. Surv. India* 21(1-4): 84–87.

Abstract: The paper gives an enumerative account of 88 plant species which are new additions to the Flora of Allahabad district.

1204. **Verma, B.K. & Misra, B.K. 1982.** "Cyperaceae of district Allahabad (U.P.)". *Indian J. Forest.* 5(3): 226–238.

Abstract: The present investigation records 54 species belonging to 6 genera of the family Cyperaceae from Allahabad district. Out of these 54 species, 27 have been recorded for the first time from the district and one of them belongs to genus *Fuirena* not recorded earlier from this area. Artificial eys with short description to these species have been provided for quick and easier identification.

1205. **Verma, B.K. & Ranjan, V. 1995.** Flora of Lalitpur district. In: Pandey, A.K. (Ed.). *Taxonomy and Biodiversity.* CBS Publication & Distribution, New Delhi. Pp. 87–94.

Abstract: The paper gives an account of flora of lalitpur district (U.P.). In all 535 species belonging to 379 genera of 110 families of angiosperms, are reported. Floristic affinitiesof the flora are also discussed.

1206. **Verma, B.K. & Shukla, G. 1992.** "A taxonomic account of genus *Indigofera* L. in Bundelkhand region (U.P.)". *J. Econ. Taxon. Bot.* 16(1): 213–217.

Abstract: A taxonomic account of the genus *Indigofera* L. which is represented by 12 species in Bundelkhand region of Uttar Pradesh has been presented. Key to the

species, a brief description and up-to-date nomenclature of each taxon have been provided.

1207. **Verma, B.K. & Sinha, B.K. 1985a.** "Contribution to the flora of Banda district, U.P.". *J. Econ. Taxon. Bot.* 7(1): 37–44.

Abstract: The paper gives an enumerative account of 53 angiospermous taxa which are new additions to the flora of Banda district.

1208. **Verma, B.K., Shukla, G. & Sinha, B.K. 1989.** "Studies in flora of Bundelkhand (U.P.). Family–Cyperaceae". *J. Econ. Taxon. Bot.* 13(2): 417–437.

Abstract: The present investigation records 54 species belonging to 7 genera of the family Cyperaceae from Bundelkhand. Out of these 54 species, one species of genus *Fimbristylis* viz., *F. dipsacea* (Rottb.) Clarke is new record for the Flora of Upper Gangetic Plain. Artificial keys to the genera and species with short descriptions have been provided for quick and easier identification.

1209. **Verma, B.K., Sinha, B.K. & Shukla, G. 1988.** "A taxonomic account of genus *Alysicarpus* Neck. ex Desv. in Bundelkhand region of U.P.". *Proc. Natl. Acad.* Sci., *India* B 58(1): 105–110.

Abstract: A taxonomic account of genus *Alysicarpus* Neck. ex Desv. in Bundelkhand (U.P.), with up to date nomenclature, supplemented by an artificial key is given. The genus, in this area, is represented by 9 taxa, out of which *A. bupleurifolius* var. *gracilis* Baker and *A. hamosus* Edgew. are of rare occurrence in Uttar Pradesh.

1210. **Verma, B.K., Sinha, B.K. & Shukla, G. 1992.** "Genus - *Crotalaria* L. in Bundelkhand region (U.P.)". *J. Econ. Taxon. Bot.* 16(2): 291–294.

Abstract: The paper provides a taxonomic account of the genus *Crotalaria* L. in Bundelkhand, U.P. The genus is represented in the area by 10 species including their two varieties.

1211. **Vohra, J.N. & Basu, D. 1990.** "An assessment of the orchid flora of Almora district". *J. Econ. Taxon. Bot.* 14(1): 33–40.

Abstract: Strachey & Winterbottom (1908) reported 44 species of orchids from this district. Rao (1959, 1960) added more. Sunsequently surveys have further raised the number. But 15 of the species reported by Strachey & Winterbottom (*l.c.*) have not been collected again. In the present paper enumerates 68 species with brief notes.

1212. **Wadhwa, B.M. 1977.** "Floristic studies in North-Western Himalaya, India– Present status and future strategy". *Bull. Bot. Surv. India* 19(1-4): 185–194.

1213. **Wadhwa, B.M. & Vohra, J.N. 1963.** "The genus *Aloina* (C. Muell.) Kindb. In India". *Bull. Bot. Surv. India* 5(3&4): 325–326.

Abstract: In this note the genus *Aloina* (C. Muell.) Kindb. has been recorded for the first time for India from Ghastoli, Garhwal Himalaya and is represented by *A. rigida* (Hedw.) Limpr. A detailed description with illustrations based on our specimens is given.

1214. **Wadhwa, B.M., Rao, R.R. & Hajra, P.K. 1987.** "Botany of the Valley of Flowers National Park and its environs". *Bull. Bot. Surv. India* 29(1-4): 129–175.

Abstract: The Valley of Flowers National Park is in the Garhwal Himalayas and this paper provides a list of plant species found there with their flowering time, altitude range of distribution, habit, vegetation, climate and topography. The rare plants deserving conservation have also been listed.

1215. **Watts, N.A. 1953.** *Flora of Agra District– A descriptive key to the flora.* Calcutta.

1216. **Wildlife Institute of India. 2012.** Assessment of Cumulative Impacts of Hydroelectric Projects on Aquatic and Terrestrial Bio-Diversity in Alkananda and Bhagirathi Basins. Report Wildlife Institute of India (WII), Dehradun.

Fungi, Lichens, Algae, other non-flowering plant groups and Gymnosperms

1217. **Adhikari, R.S. 1992.** "Some new records of Agarics from Kumaun Himalayas". *Geobios, New Rep.* 11: 96–99.

Abstract: Six species of Agaricales viz., *Inocybe longicystis* Atk., *I. descissa* (Fr.) Quel, *I. umbrina* Bresadola, *I. splendens* R. Heim., *Leptonia serrulata* (Fr.) Kummer and *Laccaria amythestea* (Bull.) Murrill has been collected from hills of Pithoragarh, eastern most district of Kumaun.

1218. **Arya, A. & Lal, B. 1990.** "A new record of *Tricholoma* from India". *Geobios, New Rep.* 9: 172.

Abstrct: an interesting fungus, *Tricholoma erassum* (Berk.) Sacc. has been reported for the first time for India from Botanical Garden of Allahabad University.

1219. **Arya, M.K., Kumar, B., Arya, V. & Sonam. 2017.** "Seasonal variation in lichen litter in different forest types of Kumaun Himalaya, India". *Int. J. Bot. Stud.* 2(4): 28–31.

Abstract: The study aims to assess lichen litter distribution and biomass in three altitudinal zones of Kumaun Himalaya. A total of 60 permanent quadrats having 2 m x 2 m size were randomly placed in the three different forest types i.e. Q. *leucotrichophora* mixed conifer forests, *Quercus leucotrichophora* broad leaved, and Q. *floribunda* broad leaved forest along the altitudinal gradient. Lichen litter samples from each sampled quadrat were collected on quarterly basis for assessment of their density, frequency and biomass. Maximum nine lichen species were found as litter fall at Q. *floribunda* forest (2200-2500 m asl) followed by eight from Q. *leucotrichophora* broad leaved forests (1700-2100 m asl). The overall density (Ind/ha) of fallen lichen in summer, rainy, winter, and spring season was found to be ranging from 27125-46625, 3500-23125, 8750-14125, and 6250-17500 respectively across the studied forests. Lichen litter biomass (g/ha) in summer, rainy, winter, and spring season ranged between 3450-4625, 238-1263, 963-1158, and 738-1025 respectively across the studied forests. Maximum lichen litter biomass was estimated in summer due to dryness of tree twigs and branches.

1220. **Asthana, A.K. & Gupta, S. 2014.** "Tow mosses (Bryophyta) new to Western Himalaya". *Indian J. Forest.* 37(2): 189–192.

Abstract: Two mosses viz., *Myurella siberica* (C. Muell.) Reim. and *Bryum retusifolium* Card. et Vard. have been identified from Govind Wildlife Sanctuary (Uttarakhand), which are new additions to Western Himalaya. *M. siberica* was earlier reported from East Nepal, while *Bryum retusifolium* Card. et. Vard. was earlier known from Eastern

Himalaya and South India. The morpho-taxonomical details of Indian taxa are provided.

1221. **Asthana, A.K. & Sahu, V. 2012.** "Two mosses new to Western Himalayan bryoflora". *Phytotaxonomy* 12: 63–67.

Abstract: During investigation on the bryophytes of Western Himalayan, we have identified *Distichophyllum cirratum* var. *elmeri* (Broth.) P.J. Lin & B.C. Tan and *Pogonatum subtortile* (Mull. Hal.) A. Jaeger from Kilbury, Nainital, which are new additions to the western Himalayan bryoflora. Earlier, *Distichophyllum cirratum* var. *elmeri* was listed from northeast Himalaya and *Pogonatum subtortile* from eastern Himalaya (Sikkim, Darjeeling) and south India (Palni hills).

1222. **Asthana, A.K. & Sahu, V. 2013.** "Bryophyte diversity in Corbett National Park (Uttarakhand), India". *Phytotaxonomy* 13: 46–59.

Abstract: The present study deals with the investigation of bryophyte flora of Jim Corbett National Park. It includes an account of 58 species belonging to 42 genera of 25 families. The mosses are represented by 38 species of 28 genera belonging to 15 families, while liverworts are represented by 18 species of 14 genera belonging to 8 families and hornworts are represented by 2 species of 2 genera and 2 families. *Ectropothecium dealbatum* (Reinw. & Hornsch.) Jaeg., *E. Cygnicollum* (Mitt.) Jaeg., *Riccardia multifida* (L.) S. Gray, *Southbya hyalina* (Lyell.) Husn., *Solenostoma rubripunctatum* (S. Hatt.) R.M. Schust and *Lejeunea alata* Gottsche have been identified as new to western Himalaya, thus extending the range of distribution of these taxa in India.

1223. **Asthana, A.K. & Sahu, V. (2014). 2015.** "Occurrence of a rare and interesting moss *Hedwigia ciliata* (Hedw.) Ehrh. ex P. Beauv. var. *ciliata* Prodr. in Govind Wildlife Sanctuary, Uttarakhand". *Phytotaxonomy* 14: 155–157.

Abstract: During investigation on the bryophytes of Govind Wildlife Sanctuary, a rare moss *Hedwigia ciliata* (Hedw.) Ehrh. ex P. Beauv. var. *ciliata* Prodr. has been identified from this area. This species is found mainly in the Europe. Taxon has been reported for the first time from Uttarakhand. However, earlier it was merely listed from North western Himalaya. The taxon is characterised by ecostate leaves with hyaline and denticulate tip and elongated cells covered by papillae. The basal cells of the leaves are linear, rhomboidal, incrassate, sinuose, papillate and apical cells incrassate, sinuose, short quadrate to rectangular in shape. A detailed morpho-taxonomic account of the taxon is provided.

1224. **Asthana, G. & Bhagat, C. 2019.** "*Entodontopsis setschwanica* (Broth.) W.R. Buck & Ireland: An addition to West Himalayan Moss flora with a brief note on the genus *Stereophyllum* Mitt. and *Entodontopsis* Broth. in India". *Indian J. Forest.* 42(3): 259–262.

Abstract: *Entodontopsis setschwanica* (Broth.) W.R. Buck & Ireland is an epiphytic moss belonging to the family Stereophyllaceae. The plants have been observed during the survey and investigation of mosses of Garhwal hills, Uttarakhand, Western Himalaya. In India, the species has been reported from Darjeeling (West Bengal) in Eastern Himalaya and from Coimbatore (Tamil Nadu) in Western Ghats, south India

so far. Now the species is being reported here for the first time from Pipaloti in Chamoli district (Garhwal Hills), Uttarakhand which is an addition to West Himalayan Moss flora.

1225. **Awasthi, D.D. 1975.** "Lichen flora of Pindari Glacier valley, India". *Geophytology* 5(2): 178–185.

1226. **Awasthi, D.D. & Singh, S.R. 1978.** "The Lichen flora of the environs of Gangotri and Gomukh, India– I- The macrolichens". *Indian J. Forest.* 1(2): 138–146.

Abstract: The paper reports the occurrence of 74 macrolichen taxa belonging to 22 genera from the environs of Gangotri and Gomukh. *Anaptychia pseudoroemeri* Awasthi & S. Singh and *Physcia gomukhensis* Awsathi & S. Singh are new to science, *Phaeophyscia hispidula* (Ach.) Awasthi & S. Singh is a new combination and 14 species marginally marked with an asterisk (*) are new reports from India.

1227. **Awasthi, D.K. & Pande, P.C. 1984.** "A note on phytogeographical distribution of ferns and fern-allies of Almora (W.H.)". *J. Bombay Nat. Hist. Soc.* 81(3): 739–741.

Abstract: Fifty five species of pteridophytes, 51 belongs to the ferns and 4 to fern-allies have been collected from Almora of Western Himalaya.

1228. **Awasthi, D.K. & Sharma, M.P. 1980.** "Ecological and phytogeographical observations on the ferns and fern-allies of Nagapur block (Chamoli Garhwal), Western Himalayas". *Proc. Indian Acad. Sci.* (Pl. Sci.) 89: 307–313.

1229. **Awasthi, P.B. & Gotewal, S. 1991.** "Investigation of keratinophilic fungi including dermatophytes and other pathogenic forms inhabiting certain soils at Bareilly". *Geobios* 18: 100–103.

Abstract: The present investigation deals with the occurrence and distribution of keratinophilic fungi including dermatophytes and other pathogenic fungi. Ten fungi were isolated using various keratinbaits. Among all 206 positive fungal isolates, 93 were dermatophytes, 78 were keratinophilic fungi and 35 were other pathogenic fungi. Of the dermatophytes *Trichophyton rubrum* (41.2%) were recorded most frequently in the soil samples. Maximum number of keratinophilic fungi was recorded from highly polluted soil samples.

1230. **Bahuguna, Y.M., Gairola, S., Uniyal, P.L. & Bhatt, A.B. 2016.** "Moss flora of Kedarnath Wildlife Sanctuary (KWLS), Garhwal Himalaya, India". *Proc. Natl. Acad. Sci., India Sec. B: Biol. Sci.* 86(4): 931–943.

Abstract: Mosses are one of the dominant plant communities at higher elevations in the Himalaya and play an important role in the ecosystem dynamics. The authors assessed the diversity of mosses in the Kedarnath Wildlife Sanctuary (KWLS) of Garhwal Himalaya, India. A total of 113 species of mosses belonging to 65 genera are recorded along with their habitat preference, life strategies, growth forms and pattern of distribution at an altitudinal gradient in KWLS. Seven species of mosses viz., *Dicranum orthophylloides* Dix., *Prionidium setschwanicum* (Broth.) Hilp., *Funaria microstoma* Bruch ex Schimp., *Plagiomnium drummondii* (Bruch & Schimp.) T. Kop., *Aerobryopsis wallichii* (Brid.) Fleisch., *Barbella turgida* Nog. and *Thuidium talongense* Besch. are recorded for the first time from India. Twelve species of mosses are found new to western Himalaya, which were earlier reported to be endemic to eastern Himalayan region. Bryaceae (22 spp.) and *Bryum* (9 spp.) are found to be widely distributed taxa followed by Meteoriaceae (8 genera), Pottiaceae (8 genera) and Dicranaceae (6 genera).

1231. **Bahuguna, Y.M., Sumeet, G., Semwal, D.P. & Uniyal, P.L. 2014.** "Species diversity and composition of bryophytic vegetation in Garhwal Himalaya with special reference to Kedarnath Wildlife Sanctuary (KWLS), Uttarakhand, India". *Int. J. Ecol. & Environm. Sci.* 40(2/3): 75–85.

Abstract: Species diversity, attributes and community composition of moss-dominated vegetation was assessed in Kedarnath Wildlife Sanctuary in Garhwal Himalaya, India. Eight sites (viz., Chopta, Devharital, Kanchula-khark, Pothivasha, Tungnath, Gaurikund, Sershi and Triyuginarayan) situated on an elevational gradient from 1760 m to 3662 m asl were selected for the study. The composition of moss communities was quantitatively analyzed by randomly sampled quadrat method. Considering the species diversity in all types of substrates (soil, boulders, tree bark) of the sites, maximum species richness (SR) was recorded in the site Kanchula-khark (30) with greater richness in the soil and the minimum in Tungnath (10). SR increased with increasing elevation up to middle elevations and then showed a sharp decline with further increase in elevation. SR was also negatively related with total annual rainfall. The Simpson's concentration of dominance (Cd) was maximum in Tungnath (0.10) and minimum in Kanchula-khark (0.03). The SR and Cd were inversely related with each other in the study area. The moss vegetation of Devharital and Tungnath showed logarithmic distribution curve, which infers that important ecological factors are being shared more or less between species at these sites. Whereas all the other study sites showed random-niche boundary curves, which infers that species in these cases combine self-limitation of population density with self-limitation of niche space and each species is restricted to fraction of community space. Most of the study sites shared less than 30% of the total species between them, which meant significant differences in the diversity of mosses across the habitats. The analysis provides a basis for assigning a workable conservation value to such an important heritage site consisting of mixed conifer forests and alpine meadows.

1232. **Bajpai, A.B., Joshi, S. & Kumar, S. 2008.** "Soil mycoflora of mustard fields of Kanpur (U.P.)". *Phytotaxonomy* 8: 91–93.

Abstract: Mustard (*Brassica campestris* L.), a member of family Brassicaceae, is largely grown during winter season. The seeds yield an important edible oil. The oil contains glycerides of erucic acid. The oil cake after the extraction of oil is used as cattle feed (Mathur and Chauhan 1981). Studies on fungal flora of the soils of fields grown with mustard crop were made. Uncultivated soils were studied as checks. The number, frequency and population of fungal species decreased with depth in mustard-grown as well as uncultivated soils. Highest number of species was found between surface soil and 5 cm deep soil. The number of fungal species was found to be more from soils of mustard-grown fields as compared with uncultivated soil.

1233. **Bajpai, O., Mohan, N., Mohan, J. & Gupta, R.K. 2019.** "An annual algal diversity of Lakhna, Etawah, Uttar Pradesh, India". *J. Appl. & Nat. Sci.* 11(3): 619–623.

Abstract: The nature of an ecosystem can be easily assumed by the presence of planktonic diversity, as they have a major role in oxygen amelioration, binding and removal of toxic substances from water body. The present enumeration deals with the annual algal diversity from the Lakhna town of Etawah, Uttar Pradesh. During this one year period, total fifty-four species of Algae recorded *viz. Achnanthes minutissima, Amphora ovalis, Anabaena oscillarioides, A. oryzae, Ankistrodesmus falcatus, Aphanocapsa littoralis, Aphanothece microscopica, Arthrospira* sp., *Calothrix gloeocola, Chlorella vulgaris, Chlorococcum humicola, Chroococcus minor, C. minutes, Cladophora glomerata, Closterium venus, Coelosphaerium kuetzingianum, Cyclotella meneghiniana, Cylindrospermum minutissimum, Euglena minuta, Fragilaria crotonensis, Gloeocapsa magma, Gloeotrichia pisum, Gomphonema parvulum, Hydrodictyon reticulatum, Lyngbya contorta, L. epiphytica, L. majuscula, Merismopedia glauca, M. tenuissima, Microcystis aeruginosa, M. flos-aquae, M. robusta, Mougeotia calcarea, Navicula ambigua, N. brebissonii, N. lata, Nostoc commune, N. punctiforme, Oscillatoria formosa, O. subuliformis, O. princeps, Pediastrum boryanum, Phormidium ambiguum, P. fragile, P. lucidum, Rivularia aquatica, Scenedesmus bijuga, S. obliquus, Spirogyra affinis, S. submaxima, Spirulina gigantea, S. major, Ulothrix zonata* and *Zygnema collinsianum*. This information can be used as baseline data and may be further used to assess any change in algal diversity of Gangetic plain after a sufficient gap to understand the impact of changing climate on it.

1234. **Bajpai, R., Nayaka, S. & Upreti, D.K. 2017.** "Extended distribution of lichen genera *Heiomasia* and *Herpothallon* in India". *Phytotaxonomy* 17: 31–38.

Abstract: Extended distribution of seven species of *Herpothallon* viz., *H. echinatum, H. granulare, H. granulosum, H. isidiatum, H. minutum, H. philippinum* and *H. stricticum* are provided. Earlier these species were known from limited localities in parts of north-east India, coastal West Bengal or Andaman Islands and currently they are also recorded from south India, especially Western Ghats, Madhya Pradesh and Uttarakhand. Present study is based on observation of large number of specimens annotated as 'sterile specimens' and preserved at CSIR-National Botanical Research Institute herbarium (LWG). An updated key to the 45 species of *Herpothallon* and three species of *Heiomasia*, so far known from the world is also provided.

1235. **Bansal, P., Nath, V. & Srivastava, A. 2015.** "First report of the moss *Zygodon brevisetus* Wilson ex Mitt. from West Himalayan region of India". *Phytotaxonomy* 15: 28–32.

Abstract: The paper describes for the first time the occurrence of *Zygodon brevisetus* Wilson ex Mitt. in Western Himalaya, where it was found growing as epiphytic on bark in U.G.C. Academy Guest House, Nainital, Uttarakhand. Previously, this moss was reported from Sikkim, eastern part of the country and was considered endemic to that region. The present study describes the extended renge of distribution from the Eastern Himalaya region to Kumaun hills, Uttarakhand of Western Himalaya, India. A brief account on West Himalayan plants is given in the present contribution.

1236. **Bargali, K. 2011.** "Actinorhizal plants of Kumaun Himalaya and their ecological significance". *African J. Pl. Sci.* 5(7): 401–406.

Abstract: Actinorhizal plants are important in having symbiotic association with actinomycete Frankia. Nitrogen (N) fixation by actinorhizal plants is a major source of fixed N in diverse and widespread ecosystems including forests, bogs, swamps, coastal dunes, landslides, glacial deposits, shrublands, prairies and deserts. They play important roles in wild land ecosystem function and are used in land reclamation, range management, forestry, agroforestry and horticulture. In this study, 8 actinorhizal plants of Kumaun Himalayan region have been described. Habit, habitat, distribution and possible ecological significance of these plants are also described. These plants are not only important for the restoration of degraded lands, but also provide good source of timber, fuel wood, fodder, food and medicines, etc.

1237. **Begum, R. 1978.** "A new *Cheiromycelia*– From India". *Geobios* 5: 130.

Abstract: *Cheiromycelia jafaria* has been collected for the first time for India from an unidentified dead wood of Dehra Dun.

1238. **Begum, R. & Rizwana, A.R. 1977.** "*Megalodochium elaridis* (Beeli) Deighton, a new record for India". *Geobios* 4(6): 197.

Abstract: A microfungi, viz., *Megalodochium elaridis* (Beeli) Deighton, which is described here as a new record for India from Dehra Dun.

1239. **Begum, R. & Rizwana, A.R. 1978.** "*Ojibwaya perpulchra*– A new record for India". *Geobios* 5(5): 227.

Abstract: *Ojibwaya perpulchra* Sutton, which has so far not been reported from India is described here as a new record from Mussoorie.

1240. **Begum, R., Manoharachary, C. & Rizwana, A.R. 1978.** "Some interesting saprophytic fungi from India". *Geobios* 5: 96.

Abstract: Some microfungi, viz., *Helicorhiodion pulchrum* (Berk. & Corda) Hughes, *Torula graminis* Desm., *Zalerion maritima* (Linder) Anastasiou occurring on dead wood; *Isthamospora* state of *Trichthryium asterophorum* (Berk. & Br.) Hohnel and *Riessia semiphora* Fresenius saprophytic on fallen leaves; *Sarcinella* state of *Schiffnerula pulchra* (Sacc.) Petrak found on dead teak leaves and *Scytallidium* state of *Hendersonula toruloidea* Nathrass found on *Eucalyptus* sp. leaf litter have been reported as new record for India from Dehra Dun.

1241. **Beri, A. & Bir, S.S. 1995.** "Chemical analysis of some fern spores from North West Himalaya". *Indian Fern J.* 12: 188–194.

Abstract: Stoed food materials in the spores of six different fern species belonging to five genera from NW Himalaya have been analysed. It is tentatively concluded that food materials in the spores are dependent upon the habitat conditions of the species. There is no definite relationship between chromosome number of diploid members of different genera and the mount of reverse substance in spores. It is surmised that the total proteins stored in the spores play an important role in spore germination, the survival of species and ultimately their conservation.

1242. **Bhakuni, K., Punetha, R. & Kholia, B.S. 2012.** "On the rediscovery of *Pallaea calomelanos* in central Himalaya with a note on distribution". *Nelumbo* 54: 182–186.

Abstract: Among the rare ferns of India, *Pellaea calomelanos* (Sw.) Link has been rediscovered from Kumaon region of central Himalaya after a gap of nearly 100 years. In the interveining years this rare fern was not collected from any other parts of Himalaya or India. A detailed note on its distribution in India, and other parts of the world along with a note on colonisation is elaborated.

1243. **Bhatnagar, S. 2009.** "Fungal diversity on the historical monuments of Doon valley in response to biodeterioration". *Indian J. Forest.* 32(2): 307–312.

Abstract: Fungi are one of the most important biodeteriogenous that grow on old building of historical and religious importance and damage a lot. During this study biodeterioration caused by fungi on the historical monument of Doon valley was conducted on two monuments of Guru Ram Rai Darbar Sahib and Tapkeshwar Mahadev temple. The study was conducted in various seasons i.e. rainy, winter and summer. A total number of thirty-three fungi were isolated in Darbar Sahib and thirty-four in Tapkeshwar Mahadev temple. Maximum numbers of fungi were isolated during rainy season in both the monuments. Mainly genera of Zygomycetes and Deuteromycetes have isolated in which *Aspergillus, Fusarium, Rhizopus* and *Penicillium* are more common.

1244. **Bhatt, R.P., Kumar, A. & Lakhanpal, T.N. 1988.** "Fleshy fungi from North–Western Himalayas –VII". *Indian J. Mycol. & Pl. Pathol.* 18: 143–148.

1245. **Bhatt, R.P., Semwal, K.C. & Upadhyay, R.C. 2007.** "New records of section Phalloideae of the genus *Amanita* from Garhwal Himalaya, India". *Mushroom Res.* 16(2): 61–67.

1246. **Bhatt, R.P., Mehmood, T., Uniyal, P. & Singh, U. 2017.** "Six new records of genus *Amanita* (Amanitaceae) from Uttarakhand, India". *Curr. Res. Environm. & Appl. Mycol.* 7(3): 161–182.

1247. **Bhatt, V.K., Bhatt, R.P., Gour, R.D. & Singh, M.P. 1999.** "Mushrooms of Garhwal Himalaya: The genus *Amanita* Pers ex Hooker". *Mushroom Res.* 8(2): 1–8.

1248. **Bhattacharyya, G. 2011.** "Exotic gymnosperms of ranikhet". *J. Econ. Taxon. Bot.* 35(4): 668–676.

Abstract: The present short research communication consists of an enumeration of 27 exotic gymnosperm species from Ranikhet area. These were introduced mainly for afforestation purpose and have naturalised themselves in the native ecosystem. The common name, botanical description and country of origin have also been furnished herewith.

1249. **Bir, S.S. & Trikha, C.K. 1973.** "*Cystopteris fragilis* in the Western Himalayas". *American Fern J.* 66: 109–110.

1250. **Bir, S.S., Satija, C.K., Vasudeva, S.M. & Goyal, P. 1983.** *Pteridophytic Flora of Garhwal Himalayas.* Jugal Kishore & Co., Dehra Dun.

1251. **Bisht, G.S. & Shrivastava, S.L. 1992.** "*Cercosporidium dubium* (H. Riess) Liu. & Guo.: An addition to Indian Hyphomycetes". *Geobios, New Rep.* 11: 89–90.

Abstract: *Cercosporidium dubium* (H. Riess) Liu. & Guo. on *Chenopodium album* leaves has been reported for the first time for Indian Hyphomycetes from Garhwal Himalaya.

1252. **Chandra, P. 1979.** "Ferns of Kedarnath, Madhyamaheshwar and Tungnath". *J. Bombay. Nat. Hist. Soc.* 74(Sppl.): 640–650.

Abstract: The paper describes the fern flora of Madhyamaheshwar and Tuungnath hills, regions hitherto not botanically surveyed. This is the first record of ferns from these areas. The paper also includes the ferns of Mandakini valley and a survey of ecological distribution of ferns in the altitudinal range of 1200-4200 m.

1253. **Chaturvedi, P., Panthri, D., Rana, S., Kandpal, V., Mehra, G., Rawat, D.S. & Tewari, S.D. 2017.** "Checklist of bryophytes of Pantnagar, Uttarakhand, India". *Phytotaxonomy* 17: 74–80.

Abstract: The present study provides an enumeration of the bryoflora of Pantnagar region located in Terai of Uttarakhand state. In the investigation a total of 34 species have been reported belonging to three classes, four subclasses, eight orders, 14 families and 22 genera. Out of these, liverworts are represented by six species, hornworts by one species and mosses by 27 species. In mosses, two families viz., Pottiaceae and Bryaceae are reported dominant in the area with 10 and seven species respectively, whereas liverworts are dominated by Ricciaceae. *Riccia, Gemmabryum, Hydrogonium, Fissidens* and *Physcomitrium* are some dominant genera in the area.

1254. **Chowdhury, N.P. 1973.** *The Pteridophytic Flora of the Upper Gangetic Plains.* Navyug Traders, New Delhi.

1255. **Cleghorn, H. 1867.** "Notes upon the Pines of the North-west Himalaya". *J. Agric. Hort. Soc. India* 14: 263–272.

1256. **Dar, G.H. & Christensen, K.I. 2003.** "Gymnosperms of the Western Himalaya- 1. The Genus *Juniperus* (Cupressaceae)". *Pakistan J. Bot.* 35(3): 283–311.

Abstract: A thorough study of an extensive collection of herbarium specimens and literature of *Juniperus* (Cupressaceae) from the Western Himalaya, during our work on gymnosperms of this region, has revealed that the taxonomy of West Himalayan Junipers has been confusing. A total of up to 6 taxa have been reported from this region by various earlier workers under a large number of specific and infraspecific names, most of which are synonyms. Seven taxa are recognised from the Western Himalaya in the present study: one belonging to *Juniperus* Sect. Juniperus, *J. communis* var. *saxatilis*, and the other six to J. Sect. Sabina. The latter section includes two acicular-leaved species, *J. squarnata* and *J. recurva*, and four scale-leaved species: two multiseed, *J. semiglobosa and J. polycarpos,* and *two monoseed, J. wallichiana* and *J. pseudosabina.*

1257. **Das, K. & Sharma, J.R. 2001.** "A new records of *Lactarius* from India". *Indian J. Forest.* 9(2): 284–286.

Abstract: Morphological and microscopic characters and ecology of *Lactarius picinus* Fr. as a new record for Indian Russulaceae from Almora district are described and illustrated here.

1258. **Das, K. & Sharma, J.R. 2003.** "New records of *Russula* from Kumaon Himalaya". *Indian J. Forest.* 26(3): 320–326.

Abstract: *Russula raoultii* Quelet, *R. anatine* Romagnesi and *R. decolorans* Fries are described in detail and well illustrated in the present communication. The first two are reported for the first time, while the last one was hitherto known incompletely from India.

1259. **Das, K. & Sharma, J.R. 2004.** “Russulacean macrofungi in North-western Himalaya”. *Phytotaxonomy* 4: 1–10.

Abstract: A total of 149 taxa (135 species and 14 varieties) belonging to the family Russulaceae have been recorded from various vegetational zones of North-western Himalaya. About 76% of them preferably share deciduous and coniferous forests equally and only 4% grow in both. Nearly 15% grow in mixed forests, 2% in all types of forests and 3% in grassy grounds. Temperate forests are most productive and support about 77% of taxa, while only 4% grow up to treeline and beyond, in alpine meadows/morains. Oaks are the best hosts supporting about 60% of taxa followed by *Cedrus* (34%) and *Pinus* (26%). Type of threats and conservation of these fungi are also discussed.

1260. **Das, K. & Sharma, J.R. 2005.** “New records of *Lactarius* from India”. *Ann. Forest.* 13(1): 1–8.

Abstract: Morphological and anatomical characters supported with illustrations and ecology of *Lactarius lignyotus* var. *lignyotus* from Uttaranchal and Himachla Pradesh, *L. subvellereus* var. *subdistans* and *L. gerardii* var. *subrubescens* from Uttaranchal are described in this communication for the first time from India.

1261. **Das, K., Sharma, J.R. & Bhatt, R.P. 2005.** “Two new varieties of *Russula* from India”. *Ann. Forest.* 13(2): 281–286.

Abstract: Two new varieties of *Russula* viz., *R. amoenicolor* var. *ramgarhensis* from Ramgarh, Uttaranchal and *R. flavida* var. *dhakurianus* proposed from Dhakuri, Bageshwar, Uttaranchal as new varieties from India are described and illustrated here.

1262. **Das, K., Sharma, J.R. & Bhatt, R.P. 2007.** “Ecological studies on the family Russulaceae of Kumaon Himalaya”. *Indian J. Forest.* 30(4): 543–549.

Abstract: The systematic identification of seventy six taxa of Russulaceae occurring in Kumaon Himalaya is followed by establishment of their relation with habitat. Also analysed are the threats in general and measures for their conservation.

1263. **Deroliya, P.K., Srivastava, S.K. & Durgapal, A. (2016). 2017.** “An enumeration of fern flora of Champawat district, Uttarakhand”. *Phytotaxonomy* 16: 102–110.

Abstract: The present paper deals with the ferns of Champawat district (Uttarakhand). A total of 103 species of pteridophytes belonging to 48 genera under 17 families have been enumerated. Out of these 56 species are terrestrial and 51 species are common in the area.

1264. **Deroliya, P.K., Srivastava, S.K. & Durgapal, A. 2017.** “Ethnobotany of pteridophytes of Champawat district, Uttarakhand”. *Ethnobotany* 29: 15–21.

Abstract: A study of ethnobotanically important pteridophytes of district Champawat, Uttarakhand is presented. This list was prepared on the basis of informal discussions and information provided by the local people and local medicine men during the field survey. About 43 species of ferns and fern-allies have been reported to be

used for food, biofertilizers, medicine, fibre, beverages, ornamental and ritual purposes by the local inhabitants of the region.

1265. **Devi, S. & Singh, J. 1985.** "A note on the fast spreading of *Pteris vittata* in urbanised areas". *Indian Fern J.* 3: 38–41.

Abstract: In view of the available information on the hazardous nature of the spores of *Pteris vittata*, its gradual spread to the urbanised area of Lucknow and Kanpur was found to be significant.

1266. **Devi, S., Yasmeen & Singh, J. 1985.** "Incidence of fern spores in the ambient air of Lucknow". *Indian Fern J.* 2: 32–38.

Abstract: Qualitative air sampling at different points in Lucknow suggested the presence of fern spores in the ambient air, especially in the gardens.

1267. **Devi, S., Nigam, R.K., Yasmeen & Wadhwani, K. 1992.** "Association between spores of pteridophytes and fungi in the environment". *Indian Fern J.* 9: 41–50.

Abstract: Associations of pteridophytes spores and fungi in the environment of Lucknow, India have been studied through analysis of freshly collected spores, aeromycoflora of fern house, fern house soil nd pathogenic fungi. *Alternaria alternate* was observed on *Ceratipteris* roots and *Aspergillus* was very common to roots and spores. Besides pathogenic infection of fungi on spores, there is a definite natural or chance association of the fern spores with fungal spores.

1268. **Dhir, K.K. & Rani, K. 1979.** "The genus *Athyrium* Roth in Nainital hills". *J. Bombay Nat. Hist. Soc.* 76(1): 49–58.

Abstract: The paper deals with an illustrated taxonomic account of ten species of the genus *Athyrium* Roth from Nainital hills (North-Western Hiamalayas). From the detailed morphological observations, it is concluded that caudex coupled with indusial and spore ornamentation are found to be constant and decisive characters to classify the species. Half the number of species have distinctly perisporiate spores whereas the other half falls into the category of having non-perisporiate spores.

1269. **Dhir, K.K. & Sood, A. 1981.** "Fern flora of Mussoorie hills". *Biblioth. Pteridologica* 2: 1156.

1270. **Dhyani, A., Nautiyal, B.P., Nautiyal, M.C., Rivera, M.C., Prasad, D. & Singh, K.P. 2012.** "First report of *Botrytis cinerea* on *Lilium polyphyllum,* a critically endangered herb in Uttarakhand, India". *Phyton-Int. J. Experimental Bot.* 81(2): 157–159.

Abstract: *Lilium polyphyllum* is a critically endangered herb in the wilds of Uttarakhand (Dhanaulti), India. Gray mold appeared as a new disease on this species from July to August (2008-2009) causing death of inflorescences and shoots. *Botrytis cinerea* was consistently isolated on PDA, from infected inflorescences. Pathogenicity was established by inoculation of potted plants of *L. polyphyllum* in a glasshouse. *Botrytis cinerea* was recorded as a gray mold pathogen on *L. polyphyllum* for the first time in India, causing flower and shoot blight. This disease may seriously affect reproductive stages of this endangered host. To our knowledge, *B. cinerea* had not been reported previously on *L. polyphyllum*.

1271. **Dixit, R.D. 1982.** "*Woodsia hancockii* Baker- A fern new to India". *J. Econ. Taxon. Bot.* 3: 963–964.

Abstract: *Woodsia hancockii* Baker is described in detail with illustration for the first time for India region from North-West Himalaya (Chamoli and Kumaon) and Himachal Pradesh.

1272. **Dixit, R.D. & Das, S. 1994.** "*Loxogramme mussoriana* Dixit *et* Das– A new species of ferns from India". *Indian Fern J.* 11: 60–62.

Abstract: A new species of ferns, *Loxogramme mussoriana* Dixit *et* Das has been described in details from Mussoorie hills in Uttar Pradesh with key to confused taxa and illustrations etc. to facilitate easy identification.

1273. **Dwivedi, S. & Misra, P.K. 2007.** "Genus *Cosmarium* Corda ex Ralfs from fresh water habitats of central and western Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 31(2): 387–397.

Abstract: The paper deals with the 36 species of the genus *Cosmarium* Corda ex Ralf found in various permanent and semi-permanent fresh water bodies of three semi arid zones of Uttar Pradesh. Most of the species have been reported for the first time from the area. The key to the species has also been provided for identification, with photographs of the taxa.

1274. **Dwivedi, S., Misra, P.K. & Suseela, M.R. 2004.** "Some desmids from central and western Uttar Pradesh, India". *Phytotaxonomy* 4: 64–73.

Abstract: In the present paper, 24 taxa of desmids have been reported from different fresh water bodies of central and western Uttar Pradesh. Of these, three belong to genus *Pleurotaenium*, eleven to genus *Euastrum*, three to genus *Micrasterias* and *Arthodesmus*, two to genus *Desmidium* and one each to genus *Hyalotheca* and *Spondylosium*. Since the fresh water desmids of central and western Uttar Pradesh have not been explored earlier, the present work will be useful in providing a database for freshwater algal (bio) diversity of India.

1275. **Dwivedi, S., Misra, P.K. & Suseela, M.R. 2008.** "Diversity of Chlorococcales from fresh water habitats of central and western Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 32(1): 19–26.

Abstract: The present communication deals with 28 chlorococcalean members belonging to 17 genera. Of these, *Selenastrum* consists the maximum four species, followed by *Oocystis, Ankistrodesmus* and *Crucigenia* (3 spp. each) and *Chlorococcum* and *Coelastrum* (2 spp. each). Rest of the genera, viz., *Schroederia, Hydrodictyon, Sorastrum, Tetraedron, Chlorella, Gloetanium, Nephrocytium, Botryococcus* and *Kirchneriela* are represented by a single species. The common and rare species were also identified on the basis of their occurrence in different ponds and lakes for conservation purposes.

1276. **Gaur, R.D. & Bhatt, B.P. 1994.** "Folk utilization of some pteridophytes of Deoprayag area in Garhwal Himalaya". *Econ. Bot.* 48(2): 146–151.

1277. **Gaur, R.D. & Painuli, P. 1992.** "Some little known pteridophytes from Garhwal Himalaya". *J. Econ. Taxon. Bot.* 16(2): 345–347.

Abstract: *Adiantum pedatum* L., *Asplenium sarelli* Hook., *Macrothelypteris ornata* (Wall. ex Bedd.) Ching., *Asplenium viride* Hudson, *Athyrium flabellulatum* (Clarke) Tard.-Blot. have been collected for Garhwal Himalaya for the first time.

1278. **Gaur, R.D. & Painuli, P. 1993.** "Some little known pteridophytes from Garhwal Himalaya". *Indian J. Forest.* 16(1): 88–90.

Abstract: Some little known pteridophytes, viz., *Arthromeria lehmanni* (Mett.) Ching., *Lepisorus pseudonudus* Ching. (Polypodiaceae), *Cryptogramma stellar* (Gmel.) Pantl. (Cryptogrammaceae), *Actinopteris radiata* (Sw.) Link. and *Athyrium nigripes* (Bl.) Moore (Actinopteridaceae) have been recorded from remote localities of Garhwal Himalaya.

1279. **Goel, A.K. & Bhattacharyya, U.C. 1981.** "Contribution to the pteridophytic flora of Tehri district (Garhwal)". *Indian J. Forest.* 4(1): 30–37.

Abstract: The paper gives an account of the pteridophytic flora of district Tehri in Garhwal Himalayas. 57 species have been enumerated with brief notes on their habit, habitat and ecology. Importance of their conservation before they are lost by various developmental activities has been pointed out.

1280. **Gopal, R., Singh, Y.P., Rawat, S. & Singh, N. 2004.** "Mycorrhizal associations of some medicinal plants". *Ann. Forest.* 12(2): 278–284.

Abstract: Six- to ten-month old seedlings of ten medicinal trees/shrubs were scanned for arbuscular mycorrhizal infection types, root colonization and root zone spore populations. The survey was conducted in month of May-June, 2002 in the Central Nursery of Forest Research Institute, Dehra Dun. Two plants, viz., *Putranjiva roxburghii* and *Saraca asoca* did not support fungal infection at all. These plants have been assigned status of non-hosts. Rest of the plants had arbuscules as well as vesicles in the root while *Musea serrea* had only vesicles. Therefore, their associations may be termed as vesicular-arbuscular. Colonization of root was generally high, ranging from 54 per cent (*Terminalia chebula*) to 100 per cent (*Syzygium cuminii*). Spore population was also reasonably high in the root zone of the medicinal plants. The minimum i.e. 25.0 spores/25 ml of soil were recovered from the root zone of *Sapindus mukorossi* while maximum 1474.1 from *Anthrocephalus chinensis*.

1281. **Guleri, S., Bhandari, B.S. & Saklani, K. 2017.** "Morpho-taxonomic diversity of soil microfungi in selected croplands of Doon valley of Uttarakhand Himalayas". *Phytotaxonomy* 17: 58–70.

Abstract: The present communication deals with the morpho-taxonomic diversity of soil microfungi isolated from some croplands of Doon valley of Uttarakhand Himalaya. Four croplands viz., DOI, BHAU, TEL and RAJ were selected to isolate the soil fungi. Out of the 20 species reported, 15 species belongs to Mitosporic fungi (Deuteromycota), one belong to Ascomycota and four species belong to Zygomycota. The present investigation will be helpful in documentation and conservation as well as in controlling various soil borne pathogens and diseases.

1282. **Guleri, S., Saxena, S. & Bhandari, B.S. 2012.** "Soil mycoflora of some agroforestry areas of Doon valley (Uttarakhand)". *Ann. Forest.* 20(2): 193–199.

Abstract: The study reports the diversity of soil mycoflora of some selected agroforestry areas of Doon valley of Uttarakhand. Soil samples were collected during summer and rainy seasons and analysed for physic-chemical properties including soil texture, soil reaction (pH) and moisture content. Microbial analysis included isolation and identification of soil mycoflora. A total of 36 and 39 belonging to 14 genera

were isolated during summer and rainy seasons, respectively. *Aspergillus, Penicillium* and other members of Deuteromycotina were the dominant constituent of soil mycoflora.

1283. **Guleri, S., Saxena, S. & Bhandari, B.S. 2013.** "Morpho-taxonomic diversity of soil microfungi in Sal (*Shorea* robusta L.) forests of Doon valley of Uttarakhand Himalayas". *Phytotaxonomy* 13: 60–66.

Abstract: This communication deals with the morpho-taxonomic description of some soil microfungi isolated from sal forests of Doon valley of Uttarakhand Himalaya. Out of the 10 species reported from forest soils, 8 belong to the Anamorphic fungi (Deuteromycota) while 2 belong to Zygomycota. *Graphium* sp. is a new record for the Indian forest soils and gives a new dimension to this study for further investigation in order to explore new records from the forest soils.

1284. **Gupta, A. & Gupta, J.S. 1982.** "Distribution of antibiotic producing Actinomycetes in soils of Agra division". *Geobios, New Rep.* 1: 15–17.

Abstract: Out of 185 strains of actinomycetes isolated from different soils of Agra Division, 142 (76.76%) showed an inhibitory effect against the 7 test organisms, out of 8 tested.

1285. **Gupta, M., Jain, S. & Bohra, A. 1991.** "Rhizosphere mycoflora of some ferns from the Kumaon hills, Uttar Pradesh, India". *Indian Fern J.* 8: 95–97.

Abstract: Rhizosphere, rhizoplane and non-rhizosphere mycoflora of six fern species has been studied. In all 15 species of fungi are isolated with dominance of *Aspergillus tamariii*. Rhizosphere has more fungi than the rhizoplane.

1286. **Gupta, P. 2015.** "First record of *Chaenothecopsis* Vainio from India". *J. Econ. Taxon. Bot.* 39(1): 169–171.

Abstract: *Chaenothecopsis savonica* (Rasanen) Tibell on decaying wood of *Mangifera indica* L. from northeastern Uttar Pradesh is reported as a new record for Indian mycota.

1287. **Gupta, P. & Sinha, G.P. 2015.** "Foliicolous lichens new to Uttar Pradesh, India". *Geophytology* 45(1): 77–80.

1288. **Gupta, P. & Sinha, G.P. 2016.** "New records of lichen taxa from Uttar Pradesh, India". *Cryptogams Biodiversity & Assessment* 1(2): 64–69.

Abstract: A preliminary survey of lichen diversity in the Terai regions of Uttar Pradesh has been carried out in Pilibhit district. The investigation revealed three species viz. *Agonimia allobata* (Stizenb.) P. James, *Coenogonium aciculatum* Lücking & Aptroot and *Malmidea bakeri* (Vain.) Kalb, Rivas Plata & Lumbsch are new records for India and ten species viz. *Arthonia cinnabarina* (DC.) Wallr., *Bacidia medialis*, *Fissurina cingalina* (Nyl.) Staiger, *Graphis caesiella* Vain., *G. filiformis* Adaw. & Makhija, *G. lineola* Ach., *G. pyrrhocheiloides* Zahlbr., *Letrouitia domingensis* (Pers.) Hafellner & Bellem., *Mycomicrothelia nonensis* (Stirt.) D. Hawksw. and *M. thelena* (Ach.) D. Hawksw. are new records for Uttar Pradesh.

1289. **Gupta, P. & Sinha, G.P. 2017a.** "Lichen diversity in Sohelwa Wildlife Sanctuary, Uttar Pradesh, India". *Indian J. Forest.* 40(2): 201–204.

Abstract: The paper deals with an account of lichen diversity in Sohelwa Wildlife Sanctuary, Uttar Pradesh. The study revealed occurrence of 39 taxa belonging to 20 genera and 14 families. Physciaceae is the most dominant family and *Bacidia* is the most dominant genus in the area. In addition, *Arthonia dispersula* Nyl., *Herpothallon stricticum* Jagadeesh & G.P. Sinha, *Graphis consimilis* Vain. and *Pyxine consocians* Vain. are reported as new records for Uttar Pradesh.

1290. **Gupta, P. & Sinha, G.P. (2016). 2017b.** "Diversity and distribution of lichens in Pilibhit district of Uttar Pradesh, India". *Phytotaxonomy* 16: 125–130.

Abstract: An enumeration of 44 species belonging to 22 genera and 18 families of lichens from Pilibhit district of Uttar Pradesh is provided. Corticolous lichens exhibit maximum diversity with 37 species followed by 6 foliicolous and single species of lignicolous lichens. Among the different growth forms, crustose lichens exhibit maximum diversity with 40 species followed by 4 foliose lichens.

1291. **Gupta, R.K. 2001.** "A new species of *Petalonema* Berk. from Dehra Dun, India". *Indian J. Forest.* 24(4): 500–502.

Abstract: A new species of *Petalonema* Berk. viz., *P. striato-theca* Gupta, sp. nov. has ben described from Tiuni hills, Dehra Dun, Uttaranchal, India. The species is characterised by the presence of deep divergent scar lamellation in the outer sheath and trichome cells longer in size.

1292. **Gupta, R.K. & Ambrish, K. 2004.** "Freshwater red algae from Dehradun, Uttaranchal, India". *Phytotaxonomy* 4: 135–137.

Abstract: *Batrachospermum moniliforme* Roth (Batrachospermaceae) and *Compsopogon coeruleus* (Balbis) Mont. (Erythrotrichiaceae) are two red algae species collcted from Dehradun, Uttaranchal and described with illustrations as new record for Uttaranchal.

1293. **Habib, I. 1991.** "Some Chlorococcales from Nainital (U.P.), India". *New Botanist* 18: 121–123.

1294. **Habib, I. 1993a.** "Studies on the genus *Spirogyra* from Pilibhit (U.P.), India". *J. Econ. Taxon. Bot.* 17(3): 557–559.

Abstract: The present communication deals with the morphotaxonomical consideration of 11 species of *Spirogyra* Link belonging to order Zygnematales. The collections have been made during 1986-1991 from Pilibhit district (Uttar Pradesh), India. All these taxa are being recorded for the first time from this part of the state.

1295. **Habib, I. 1993b.** "Some Chlorococcales from Najibabad (U.P.), India". *J. Econ. Taxon. Bot.* 17(3): 580–582.

Abstract: The present communication deals with the taxonomical enumeration of 16 taxa of Chlorococcales collected from different localities situated in and around Najibabad (U.P.), India during 1989-1992. All these taxa are being recorded for the first time from this part of state.

1296. **Habib, I. 1995.** "Desmids of Lakhimpur-Kheri, U.P.". *J. Econ. Taxon. Bot.* 19(2): 307–311.

Abstract: The present communication records 29 taxa of Desmidiaceae collected from different places situated in and around Lakhimpur-Kheri of Uttar Pradesh state of India. The findings are new to this part of India.

1297. **Habib, I. 1996.** "A systematic account of Chlorococcales from Najibabad (U.P.), India". *J. Econ. Taxon. Bot.* 20(3): 681–684.

Abstract: Twenty eight taxa of Chlorococcalean algae were collected from different localities situated in and around Najibabad in Uttar Pradesh state of India are enumerated here. All these taxa are being reported for the first time from this part of state during 1994-1995.

1298. **Habib, I. 1997a.** "An enumeration of desmids from Pilibhit, U.P., India". *J. Econ. Taxon. Bot.* 21(3): 659–661.

Abstract: An extensive survey of fresh water algae was made from different localities of Pilibhit district of Uttar Pradesh during 1993-1995. The algal materilas collected 27 desmid taxa belonging to 12 genera are reported for the first time from this part of state.

1299. **Habib, I. 1997b.** "Some Chlorococcales from Kotdwara (Garhwal), India". *New Botanist* 24: 120–128.

1300. **Habib, I. 2000.** "Diatoms from foothills of Garhwal Himalaya". *J. Econ. Taxon. Bot.* 24(1): 104–106.

Abstract: The present communication deals with the morhotaxonomic enumeration of 25 taxa of freshwater diatoms belonging to 10 genera described from foothills of garhwal Himalaya during 1997-1998. All these taxa are being recorded for the first time from this part of state. The following genera of diatoms are represented *Synedra* (1), *Cocconeis* (1), *Gyrosigma* (2), *Navicula* (5), *Pinnularia* (1), *Cymbella* (5), *Gomphonema* (4), *Epithemia* (1), *Nitzschia* (3) and *Surirella* (2).

1301. **Habib, I. 2001a.** "A preliminary study on certain algal flora from the foot hills zone of Garhwal Himalaya". *J. Econ. Taxon. Bot.* 25(2): 317–322.

Abstract: Forty taxa of different classes of algae, viz., Cyanophyceae (13), Chlorophyceae (7), Vaucheriaceae (1), Bacillariophyceae (13), Euglenophyceae (6) have been dealt herewith. They were collected from several places situated in and around Kotdwara. Notes on forms showing slightly variations in their morphological attributes have also been given. All these taxa have been recorded for the first time from this region.

1302. **Habib, I. 2001b.** "Epiphytic algal flora of fresh water bodies of Kotdwara-Chaetophorales". *J. Econ. Taxon. Bot.* 25(2): 350–352.

Abstract: The present communication deals with morpho-taxonomic enumeration of 11 taxa of Chaetophorales collected from different localities situated in and around Kotdwara (Garhwal) during 1997-1998. All these taxa are being recorded for the first time from this part of state.

1303. **Habib, I. 2007.** "Chaetophorales of Sitapur, U.P. state, India". *J. Econ. Taxon. Bot.* 31(1): 16–18.

Abstract: The present communication deals with the morpho-taxonomic enumeration of 12 taxa of Chaetophorales collected from different localities situated in and around

Sitapur district of Uttar Pradesh state during 2002-2003. Notes on certain forms showing slightly variations in their morphological attributes have also been given. All these taxa are being recorded for the first time from this part of state.

1304. **Habib, I. 2008a.** "Epiphytic algal flora of fresh water bodies of Bundelkhand Division of Uttar Pradesh". *J. Econ. Taxon. Bot.* 32(1): 1–3.

Abstract: The present communication deals with taxonomic enumeration of 10 taxa of Chaetophorales collected from different localities situated in and around Bundelkhand Division of Uttar Pradesh during 2001-2002. All these taxa have been recorded for the first time from this part of stte.

1305. **Habib, I. 2008b.** "Contribution to the desmids of Sitapur, U.P.". *J. Econ. Taxon. Bot.* 32(1): 167–173.

Abstract: The present communication deals with morphotaxonomic enumeration of 35 taxa of desmids collected from different localities situated in and around of Sitapur during 2002-2003. Notes on forms showing slight variations in their morphological attributes have also been given. All these taxa have been recorded for the first time from this part of the state. The genera of the desmids represented in the area include: *Closterium* (12 spp.), *Pleurotaenium* (1 sp.), *Euastrum* (1 sp.), *Cosmarium* (19 spp.), *Arthrodesmus* (1 sp.) and *Staurastrum* (1 sp.).

1306. **Habib, I. 2009.** "Morphotaxonomic enumeration of desmids from Hardoi district (Uttar Pradesh, India)". *J. Indian Bot. Soc.* 88: 27–31.

1307. **Habib, I. 2012.** "Systematic enumeration of Chlorococcales from Farrukhabad district U.P. state, India". *J. Econ. Taxon. Bot.* 36(4): 669–673.

Abstract: The present communication deals with morphotaxonomic enumeration of 30 taxa of Chloroccocalean algae collected from different localities situated in and around Farrukhabad district of Uttar Pradesh during 2009-2010. Notes on forms showing slightly variations in heir morphological attributes have also been given. All these taxa are being recorded for the first time.

1308. **Habib, I. 2013.** "Desmids of Meerut (U.P.), India". *J. Econ. Taxon. Bot.* 37(1): 45–49.

Abstract: The present communication deals with morphotaxonomic enumeration of 30 taxa of desmids collected from in and around Meerut, Uttar Pradesh state during 2011-2012. Notes on forms showing slight variations in morphological attributes have also been given. All these taxa are being recorded for the first time from this part of state.

1309. **Habib, I. 2014a.** "Desmids of Bulandshaher district (U.P.), India". *J. Econ. Taxon. Bot.* 38(2): 241–246.

Abstract: The present paper deals with morphotaxonomic enumeration of 30 taxa of desmids (Desmidiaceae) were collected from around Bulandshaher district of Uttar Pradesh state of India in the year 2012. All these taxa have been recorded for the first time this part of state from Bulandshaher during the study. Some slight variations in their morphological attributes were observed and duly recorded.

1310. **Habib, I. 2014b.** "Some Desmids (Chlorophyceae) from Jhansi (Uttar Pradesh state), India". *J. Econ. Taxon. Bot.* 38(2): 282–286.

Abstract: The present communication deals with morphotaxonomic enumeration of 25 taxa of desmids were collected from around Jhansi of Uttar Pradesh state in India during the period 2011-2012. Notes on forms showing slight variations in morphological attributes have also been given. All these taxa have been recorded for the first time from this part of state.

1311. **Habib, I. 2014c.** "Morphotaxonomic enumeration of Desmids from Kotdwara, Garhwal Himalaya, India". *J. Econ. Taxon. Bot.* 38(2): 323–328.

Abstract: The present communication deals with morphotaxonomic enumeration of 30 taxa of desmids were collected from around Kotdwara, Garhwal Himalaya of Uttarakhand state of India in the year 2011. All these taxa have been recorded for the first time this part of state from Kotdwara during the study. Some slight variations in their morphological attributes were observed and duly recorded.

1312. **Habib, I. 2015.** "Desmids from Lalitpur district (U.P.), India". *J. Econ. Taxon. Bot.* 39(1): 85–89.

Abstract: The present communication deals with morpho-taxonomic enumeration of 30 taxa of desmids collected in and around Lalitpur district in Indian state of Uttar Pradesh during 2012-2013. Notes on forms showing slight variation in morphological attributes have also been given. All these taxa are being recorded for the first time from this part of state.

1313. **Habib, I. & Barkha. 2012a.** "Desmids from Banda district, Uttar Pradesh, India". *Geophytology* 42: 43–47.

1314. **Habib, I. & Barkha. 2012b.** "Some Chlorococcales from Mahamaya Nagar district, U.P. state, India". *J. Econ. Taxon. Bot.* 36(4): 686–690.

Abstract: The present communication deals with morphotaxonomic enumeration of 30 taxa of Chlorococcalean algae collected from different localities situated in and around Mahamaya Nagar district of Uttar Pradesh state during 2009-2010. Notes on forms showing slight variations in their morphological attributes have lso been given. All these taxa are being recorded for the first time.

1315. **Habib, I. & Barkha. 2013.** "Chlorococcales of Ranikhet, Almora district, Uttarakhand, India". *J. Econ. Taxon. Bot.* 37(2): 270–273.

Abstract: 25 taxa of Chlorococcalean algae collected from different localities in and around Ranikhet, Almora district, Uttarakhand, India are enumerated. All these taxa are being recorded for the first time from this region.

1316. **Habib, I. & Chaturvedi, U.K. 2000.** "A systematic account of Chlorococcales from Kumaun Himalaya, Garhwal". *Phykos* 39: 113–118.

1317. **Habib, I. & Chaturvedi, U.K. 2007.** "Contribution to the desmids of Hamirpur". *J. Econ. Taxon. Bot.* 31(1): 33–39.

Abstract: The present communication deals with morpho-taxonomic enumeration of 35 taxa of desmids collected from in and around Hamirpur district of Uttar radish state during 2001-2002. Notes on forms showing slight variations in morphological attributes have also been given. All these taxa are being recorded for the first time from this part of state.

1318. **Habib, I. & Chaturvedi, U.K. 2014a.** "Enumeration of Desmids from Ranikhet, Kumaun Himalayas". *J. Econ. Taxon. Bot.* 38(2): 329–334.

Abstract: The present communication deals with morphotaxonomic enumeration of 30 taxa of desmids were collected from Ranikhet, Kumaun Himalaya of Uttarakhand state of India in the year 2012. All these taxa have been recorded for the first time this part of state. Some slight variations in their morphological attributes were observed and duly recorded.

1319. **Habib, I. & Chaturvedi, U.K. 2014b.** "Desmids from Haldwani, Kumaun Himalayas of Uttarakhand". *J. Econ. Taxon. Bot.* 38(3-4): 502–507.

Abstract: The present communication deals with morphotaxonomic enumeration of 30 taxa of desmids were collected from Haldwani, Kumaun Himalaya of Uttarakhand state of India in the year 2012. All these taxa have been recorded for the first time this part of state from Haldwani during the study.

1320. **Habib, I. & Chaturvedi, U.K. 2014c.** "Desmids from Kathgodam, Kumaun Himalayas". *J. Econ. Taxon. Bot.* 38(3-4): 511–516.

Abstract: The present communication deals with morphotaxonomic enumeration of 27 taxa of desmids were collected from Kathgodam, Kumaun Himalayas of Uttarakhand state of India in the year 2012. All these taxa have been recorded for the first time this part of state from Haldwani during the study. Some slight variations in their morphological attributes were observed and duly recorded.

1321. **Habib, I. & Pandey, U.C. 1988.** "Cyanophyceae of river Nakatia, Bareilly, India". *Geobios, New Rep.* 7: 92–93.

Abstract: The present communication deals with the systematic enumeration of 44 Cyanophycean alage from Nakatia river, Baraílly.

1322. **Habib, I. & Pandey, U.C. 1989a.** "Desmids from Badaun- I". *Geobios, New Rep.* 8: 175–176.

Abstract: In the present paper twenty two taxa belonging to the Desmidiaceae has been reported from Badaun district of Uttar Pradesh.

1323. **Habib, I. & Pandey, U.C. 1989b.** "Desmids from Bareilly- III". *Geobios, New Rep.* 8: 177.

Abstract: In the present paper twenty three taxa belonging to the Desmidiaceae has been collected from different localities of Bareilly district of Uttar Pradesh.

1324. **Habib, I., Barkha & Chaturvedi, U.K. 2011.** "Contribution to the knowledge of desmids of Dehra Dun, Uttarakhand state, India". *Punjab Univ. Res. J. (Sci.)* 61: 83–86.

1325. **Habib, I., Barkha & Chaturvedi, U.K. 2014.** "A systematic account of Chlorococcales from Ghaziabad (U.P.), India". *J. Econ. Taxon. Bot.* 38(3-4): 517–521.

Abstract: The present communication deals with morphotaxonomic enumeration of 30 taxa of Chlorococcalean algae collected from different localities situated in and around Ghaziabad district of Uttar Pradesh during 2009-2010. Notes on forms showing slight variations in their morphological attributes have also been given. All these taxa have been recorded for the first time from this region.

1326. **Habib, I., Pandey, U.C. & Sachdev, A. 1988.** "On some new *Scenedesmus* spp. from Baraílly (U.P.), India". *Geobios, New Rep.* 7: 156–157.

Abstract: The present communication deals with the taxonomic enumeration of 23 taxa of Chloroccocales collected from different localities situated in and around Baraílly district (U.P.), India.

1327. **Habib, I., Pandey, U.C. & Shukla, H.M. 1988.** "Blue green algae from paddy fields of Baraílly district, Uttar Pradesh, India". *Geobios, New Rep.* 7: 157–159.

Abstract: Eighty taxa of blue green alge has been collected from paddy fields of Baraílly district, Uttar Pradesh, India.

1328. **Habib, I., Shukla, H.M. & Pandey, U.C. 1989.** "*Hydrodictyon africanum* Yaman.– A new record from India". *Geobios, New Rep.* 8: 81–82.

Abstract: *Hydrodictyon africanum* Yaman. has been recorded for the first time for India from river Nakatia at Baraílly, U.P., India.

1329. **Habib, I., Shukla, H.M. & Pandey, U.C. 1992.** "A preliminary survey of Cyanophyceae of Mala forest, Pilibhit (U.P.)". *J. Econ. Taxon. Bot.* 16(2): 367–371.

Abstract: The present communication deals with the taxonomical enumeration of twenty eight species belonging to Cyanophyta collected during 1986-1987 from different areas situated in and around Mala forest, Pilibhit district (U.P.), India. All these taxa are being recorded for the first time from this region.

1330. **Habib, I., Barkha, Singh, M.P. & Chaturvedi, U.K. 2013.** "Epiphytic algal flora of fresh water bodies of Rohilkhand division of Uttar Pradesh". *J. Econ. Taxon. Bot.* 37(4): 711–713.

Abstract: The present communication deals with taxonomic enumeration of 10 taxa of Chaetophorales collected from different localities situated in and around Rohilakhand division of Uttar Pradesh during 2008-2009. All these taxa are being recorded for the first time from this part of state.

1331. **Habib, I., Ghildiyal, J.C., Negi, K.S. & Chaturvedi, U.K. 1998.** "A systematic account of Chlorococcales from Kotdwara, Garhwal". *Phykos* 37: 125–129.

1332. **Jain, P.C. 1983.** "Prevalence of keratinophilic fungi in soils of Madhya Pradesh and Uttar Pradesh". *Geobios, New Rep.* 2: 10–13.

Abstract: Seventy four isolates belonging to 19 species of 6 genera were isolated from cattle farm, poultry farm, forest and crop field soils of different localities of Madhya Pradesh and Uttar Pradesh. In all 27, 19, 15, 8 and 5 fungi were isolated from buried human hair, peacock feather, cow hoof, cow horn and human nails, respectively, when used as keratin baits. Maximum numbers of fungi were recorded from the soil samples collected from cattle farms of surveyed area.

1333. **Joshi, G.C. & Pande, P.C. 1987.** "*Helminthostachys zeylanica* (L.) Hook. (Ophioglossaceae)– A new record for Western Himalaya". *J. Bombay Nat. Hist. Soc.* 84(3): 724–725.

Abstract: *Helminthostachys zeylanica* (L.) Hook. has been recorded as new for Western Himalaya from Banbasa area of Kumaon Himalaya. This species is confined to the

east from Bengal plains to Assam, Eastern Uttar Pradesh (Bahraich and Gorakhpur) and South India only.

1334. **Joshi, G.C., Tewari, V.P. & Joshi, P. 1982.** "*Geaster mammosum*: A bacterial fungus used in Himalayan folklore". *J. Ethnopharmacol.* 6: 361–364.

1335. **Joshi, P. & Joshi, S.P. 2013a.** "Pteridophytes of Lansdowne and adjacent places– Pauri district (Garhwal Himalayas)". *Indian J. Forest.* 36(1): 147–150.

Abstract: The present manuscript deals with 42 species of pteridophytes (Ferns and Fern-allies) occurring at Lansdowne town. Family Polypodiaceae was observed as the most dominant family with highest of 7 species growing epiphytically in the area. The altitudinal range of 1000-2000 m was observed as the most favoured zone in terms of richness of species.

1336. **Joshi, P. & Joshi, S.P. 2013b.** "Pteridophytic flora of Deorai Tal- Rudraprayag district (Garhwal Himalayas)". *Indian J. Forest.* 36(3): 369–374.

Abstract: The present manuscript deals with the pteridophytic flora of Deoria Tal of Rudraprayag district. A total of 67 species under 33 genera belonging 22 families of pteridophytes from the area has been reported along with the critical notes on their ecology and distribution.

1337. **Joshi, P. & Joshi, S.P. 2015.** "Fern flora of Nachiketa Lake and adjoining areas of Uttarkashi district (Garhwal Himalayas)". *Indian J. Forest.* 38(3): 265–268.

Abstract: The present manuscript deals with 54 species of pteridophytes (Ferns only) occurring in Nachiketa Lake and its adjoining areas. Family Polypodiaceae were observed as the most dominant family with 7 species growing epiphytically in the area. Some uncommon rather rare species for the district Uttarkashi viz., *Loxogramma involuta* (D. Don) Presl., *Gymnopteris vestita* (Wall. ex Moore) Underw., *Woodsia elongata* Hook. were also collected from the study area. The altitudinal range of 2000-2500 m is observed as the most favoured zone in terms of riches of species.

1338. **Joshi, P. & Joshi, S.P. 2016.** "Present status of Pteridophytic diversity of Triyuginarayan and adjoining localities, Rudraorayag district (Garhwal Himalayas), Uttarakhand". *Indian J. Forest.* 39(1): 81–86.

Abstract: The present manuscript deals with the reassessment of the fern flora of Triyuginarayan after 10–12 years. A critical treatment of 45 genera, 122 species is done in the present study. A comparison of the families, genera and species occurring in the area during 2012–14 with the prior reports. The study reveals the absence of 48 fern species which were reported earlier by various authors and 11 new species are collected which were not reported earlier.

1339. **Joshi, P. & Pande, H.C. 2010.** "Polymorphicity in some ferns of Chamoli and Rudraprayag districts of Garhwal Himalaya". *Indian J. Forest.* 33(2): 249–252.

Abstract: Garhwal Himalayas present a rich and diverse pteridophytic flora. Chamoli and Rudraprayag the two major districts of Garhwal were extensively explored by the authors between the years 2002-2006. During the field study a great range of morphological variations in rhizome, stipe, lamina, pinna, arrangement of pinna, pinnation, pinna apex, venation pattern, spore morphology was noticed in few species of ferns from the area under study.

1340. **Joshi, P. & Pande, P.C. 2006.** "Ecology of the ferns of Chamoli and Rudraprayag districts of Garhwal (North West Himalayas)". *Indian Fern J.* 23: 52–71.

Abstract: The paper deals with the ecological account of 269 fern species occurring at Chamoli and Rudraparayag districts of Garhwal Himalaya. The ferns are classified on the basis of habitats into four major ecological groups- terrestrial (170 species), Lithophytes (142 species), epiphyte (78 species) and Hydrophytes (single species). This again classified into sub-categories. The species which occur both as terrestrial-epiphyte (11 species), terrestrial-lithophytes (56 species), epiphyte-lithophyte (67 species) and the species occurring as terrestrial-lithophyte-epiphyte (9 species) are also compiled in the paper. Apart from this the exceptionally noticed epiphytes 7 species basically either terrestrial or lithophyte, are also mentioned. The concern is required for the conservation of these ferns for which proper protection and retention of their habitats should be done; controlled anthropogenic activities should be carried out. This would lead to the conservation of our flora-fauna at the same time serve to protect the environment of Himalayas.

1341. **Joshi, P., Pande, H.C. & Pande, P.C. 2004.** "Fern flora of Mandal and adjoining localities in Chamoli district of Garhwal Himalaya". *Indian J. Forest.* 27(4): 397–403.

Abstract: The paper deals with the Fern flora of Mandal and adjoining localities in Chamoli district of Garhwal Himalaya. A total of 109 species, 48 genera and 27 families from the area have been reported in the present communication. 4 species are new records for the area. Till date only 33 fern species under 26 genera belonging to 17 families were reported from the area under study.

1342. **Joshi, P., Pande, H.C. & Pande, P.C. 2009.** *Ferns of central Himalaya-I (Chamoli and Rudraprayag).* Bishen Singh & Mahendra Pal Singh, Dehra Dun (India).

1343. **Joshi, P., Kumar, B., Dwivedi, H. & Pande, H.C. 2013.** "Ferns of Chandrabadani and surrounding areas in Tehri district, Uttarakhand". *J. Non-Timber Forest Prod.* 20(4): 285–290.

Abstract: The present paper deals with ferns of Chandrabadani and surrounding areas of Tehri district. A total of 35 species belonging to 23 genera under 12 families, have been collected from the study area and are being reported in the present communication.

1344. **Joshi, P., Kumar, B., Dwivedi, H. & Singh, C. 2015.** "Conservation status and diversity of ethnobotanically important ferns in Tehri district of Uttarakhand Himalayas". *eJ. Appl. Forest Ecol.* 3(1): 48–57.

1345. **Joshi, P., Kumar, B., Kumar, R. & Pande, H.C. 2011.** "Pteridophytes of Budha Kedar and surrounding areas in Tehri district of Uttarakhand". *Indian J. Forest.* 34(4): 479–482.

Abstract: The paper deals with the pteridophytes of Budha Kedar and surrounding areas in Tehri district of Uttarakhand. A total of 66 species under 33 genera and 20 families from the area are being reported in the present communication.

1346. **Joshi, P., Kumar, B., Pande, H.C. & Pande, P.C. 2015.** Ethnobotanically important ferns of district Tehri Garhwal of Indian central Himalaya. In: Kumar, R. (Ed.), *Ethnobotany: Indian Trends, Perspectives and Innovations*. Radha Publication, New Delhi. Pp. 3–7.

1347. **Joshi, P., Manikandan, R., Kumar, B. & Deroliya, P.K. 2016.** "Contribution to the pteridophytic flora of Govind Pashu Vihar Wildlife Sanctuary, Uttarakhand". *Indian J. Forest*. 39(3): 277–284.

Abstract: The present paper deals with the studies on the Pteridophytic flora of Govind Pashu Vihar Wildlife Sanctuary, Uttarkashi district, Uttarakhand.

1348. **Joshi, S. 2020.** *Diversity of lichens in Pindari and Milam regions of Kumaun Himalaya*. Ph. D. Thesis. Kumaun University, Nainital. (Unpublished).

1349. **Joshi, S. & Joshi, A.P. 1982.** "Ecology of *Pinus roxburghii* in western Himalayas". *Himal. J. Sci*. 2: 41–44.

1350. **Joshi, S. & Upreti, D.K. 2012.** "Lichen distribution in Milam Glacier valley of Pithoragarh district in Uttarakhand, India". *Nelumbo* 54: 193–206.

Abstract: An enumeration of the diversity and distribution of lichens in Milam Glacier valley of Pithoragarh district in Uttarakhand is provided. The area shows an occurrence of 232 species of lichens belonging to 36 families and 73 genera. Parmeliaceae with 18 genera and 49 species and Physciaceae with 7 genera and 26 species dominate the area. Among different growth forms of lichens, foliose comprises the highest number of 104 species, followed by 87 crustose lichens. The valley exhibits maximum number of bark and rock inhabiting lichens represented by 132 and 123 species respectively.

1351. **Joshi, S., Upreti, D.K. & Punetha, N. 2007.** "Lichen flora of Munsyari, Khaliya Top and Kalamuni in Pithoragarh district of Uttarakhand". *Phytotaxonomy* 7: 50–55.

Abstract: The paper enumerates 63 species of lichen. The Khaliya Top exhibits the maximum diversity with 47 species, while Kalamuni and Munsyari, the moderate growth with 18 species each. Parmeliaceae dominates the area. The paper will serve as baseline record for future biomonitoring studies in the area.

1352. **Joshi, S., Upreti, D.K. & Punetha, N. 2008.** "Change in lichen flora of Pindari Glacier valley, Uttarakhand (India), during the last three decades". *Ann. Forest*. 16(1): 168–169.

Abstract: In the present paper, the authors has recorded 136 species of lichens (80 corticolous, 35 saxicolous and 13 terricolous), enroute from Loharkhet (1700 m.) to Zero point in Pindari Glacier valley (3660 m), Bageshwar district, Uttarakhand. A comparison between the present lichen diversity with an earlier published account of lichens from the same route indicates a distinct change in the number of epiphytic corticolous (bark inhabiting), saxicolous (rock inhabiting) and terricolous (soil inhabiting) lichens. Thus, there is a distinct increase in the occurrence of epiphytic lichens in the valley.

1353. **Khare, P.B., Bajpayee, M. & Srivastava, M. 2005.** "Ecology and diversity of pteridophytic flora of Sonebhadra district (Uttar Pradesh)". *J. Econ. Taxon. Bot*. 29(1): 41–45.

Abstract: The paper enumerates the pteridophytic flora of Sonebhadra district of Uttar Pradesh. Extensive collections made over the years and review of literature

reveals that 24 species of pteridophytes belonging to 15 genera in 14 families occur in the district.

1354. **Khare, P.K. & Kumar, S. 2007.** "Studies on some pteridophytes used by the Tharu tribe of Dudhwa National Park, Lakhimpur-Kheri, Uttar Pradesh, India". *Indian Fern J.* 24: 137–147.

Abstract: Five pteridophytes, viz., *Adiantum philippense, Diplazium esculentum, Helminthostachys zeylanica, Lagodium flexuosum* and *Ophioglossum reticulatum* used by the Tharu tribe of Dudhwa National Park, Lakhimpur-Kheri, Uttar Pradesh have been investigated in the present study. Information on ethnobotanical uses of these plants is mainly based on personal communication with tribal people and local vaidyas/ exorcists called as *Bharra*. Foliar epidermis and spore characters of plants have been studied for authentic identification. Phytochemical estimations of some chemical constituents of two of these plants *Adiantum philippense* and *Ophioglossum reticulatum* have also been carried out.

1355. **Khare, R. & Suseela, M.R. 2004a.** "Fresh water algal flora of Corbett Tiger Reserve, Uttaranchal, India". *Ann. Forest.* 12(2): 233–242.

Abstract: Corbett Tiger Reserve (CTR), one of the National Parks in Uttaranchal state, lies in the Siwalik terai biotic zone abutting the Himalayan ranges. The region has a unique assemblage of floral and faunal constituents of Himalayan elements. There are no reports on the inventory of fresh water algal flora of this region. The present contribution is the result of study carried out on fresh water algal flora of a flowing stream called Dhara Shroth. Algal flora comprise a total of 41 species belonging to 28 genera of these eleven species belongs to blue-green algae (Cyanophyceae), ten are green algae (Chlorophyceae) and twenty species belongs to are diatoms (Bacillariophyceae). *Rhizoclonium* and *Spirogyra* are the dominant green algae found in this region. All the forms are first records from this area.

1356. **Khare, R. & Suseela, M.R. 2004b.** "Freshwater algal diversity of Naini Tal, Uttaranchal, India". *Phytotaxonomy* 4: 19–24.

Abstract: This paper enumerates 31 species of algal forms found growing at the water spring of Pines area situated near Naini Tal town of Kumaon hills, Uttaranchal. Out of a total of 31 species recorded, Chlorophycean and Cyanophycean forms are represented by nine species each. Bacillariophyceaen members are represented by 13 species. *Rhizoclonium* and *Spirogyra* are present in vegetative stage, while *Oscillatoria* and *Gomphonema* exhibit common occurrence. As there were no previous reports of algal flora of this region, this is the first record.

1357. **Khare, R. & Suseela, M.R. 2007.** "Fresh water algal flora from four sites of Uttaranchal". *J. Econ. Taxon. Bot.* 31(2): 374–379.

Abstract: Uttaranchal, a newly formed north Indian state, represents the unique Himalayan flora and fauna. Fresh water algal flora of this region has been worked out. A total of 10 genera and 25 species of Cyanophycean forms, 10 genera and 17 species of Chlorophycean forms, 17 genera and 38 species of Bacillariophycean forms are identified from thirty four samples. Some of these species are the first records from this region.

1358. **Kharkwal, K., Bhakuni, K., Joshi, P., Kant, R. & Nautiyal, S. 2019.** "Pteridophytic flora of Pati block, Champawat district, Uttarakhand, Northern India". *Indian J. Forest.* 42(2): 155–160.

Abstract: The present paper deals with the diversity of pteridophytic flora in Pati block of Champawat district, Uttarakhand. A total of 32 species of pteridophytes belonging to 24 genera under 15 families have been enumerated from the study area.

1359. **Kholia, B.S. 2013a.** "A new distribution record of filmy fern *Hymenophyllum denticulatum* Sw. from Uttarakhand Himalaya". *Indian Fern J.* 30: 154–160.

Abstract: The herbarium sheets housed in CAL from Milam Glacier, collected by Strachey and Winterbottom in 1848 was remained unidentified and overlooked for more than 150 years. Based on diagnostic denticulate segment margins it is identified by the present author as *Hythemenophyllum denticulatum* Sw., on the other hand species of the *Hymenophyllum* reported from western part of Himalaya are entire margined. The sheet is also compared and analysed with other serrate and denticulate Indian species for diagnosis. *Hymenophyllum denticulatum* Sw. is primarily a S.E. Asian species reached up to Assam in north eastern India. Occurrence of this species in Kumaun region of Uttarakhand Himalaya seems to be significant phytogeographically therefore presented in this communication.

1360. **Kholia, B.S. 2013b.** "Extended distribution of *Cyathea spinulosa* Wall. ex Hook. in Uttarakhand Himalaya with a note on distribution and diversification of Himalayan ferns in relation to recent climate change". *NeBIO* 4(2): 40–45.

Abstract: Tree fern genus *Cyathea* Sm. (Cyatheaceae) is rapidly decreasing throughout the world mainly due to over exploitation for ocioeconomic uses and habitat destruction hence treated as CITES plants. *Cyathea spinulosa* Wall. ex Hook. primarily a S.E. Asian element was known to occur from central Nepal eastward in Himalaya in British time. Consecutively it was also collected from four different localities in Uttarakhand Himalaya during last three decades and recently one more population is discovered by present authors. Though due to rare occurrence in Uttarakhand this species is prioritized as high conservation value plant of the state and mentioned under RET category but on critical examination and analysis it is found that the species is rapidly colonizing in some parts of the state. With the help of suitable examples it is assumed that the recent climate change may have affected the rate of westward migration of ferns within Himalaya, which is discussed here in brief.

1361. **Kholia, B.S. & Bhakuni, K. 2009.** "Western Himalaya– A new range of distribution for a critically endangered fern, *Dryopsis manipurensis* (Bedd.) Holttum & P.J. Edwards". *Nelumbo* 51: 245–248.

Abstract: *Dryopsis manipurensis* (Bedd.) Holttum & P.J. Edwards has been reported for the first time for Western Himalaya from Gini area at the base of Kalamuni range, Munshiyari, Pithoragarh district, Uttarakhand. Earlier this species was reported from Manipur, Meghalaya and Nepal.

1362. **Kholia, B.S. & Punetha, N. 1995.** "Notes on taxonomy and distribution of some pteridophytes in Kumaun (West Himalaya)". *J. Indian Bot. Soc.* 74: 183–187.

Abstract: Occurrence of *Lycopodiella cernua* and twenty six species of ferns, not described earlier is provided. Distribution of each taxon is also given.

1363. **Kholia, B.S. & Punetha, N. 2002.** "*Diplazium subsinuatum* (Wall. ex Hook. et Grev) Tag. in Central Himalaya". *Phytotaxonomy* 2: 163–165.

Abstract: During recent trips for fern collection in Kumaon Himalaya, the authors collected an interesting fern, *Diplazium subsinuatum* (Wall. ex Hook. et Grev) Tag. from Pithoragarh district, which can be easily distinguishing from other species of *Diplazium* Sw. by its simple and small lamina, arising distantly on long creeping thin rhizome. In India, this taxon was previously known only from eastern Himalaya and south India. Thus, it is a new addition to the pteridophytic flora of this region.

1364. **Kholia, B.S. & Punetha, N. 2003.** "The genus *Colysis* Presl in Western Himalaya". *Phytotaxonomy* 3: 119–123.

Abstract: Taxonomic account, distinguishing features, ecological notes and distribution of three species of the genus *Colysis* from West Himalaya are given. *C. insignae* (Bl.) J. Smith is reported for the first time for West Himalaya from Pithoragarh district.

1365. **Kholia, B.S. & Punetha, N. 2005.** "Useful pteridophytes of Kumaon (Central Himalaya, India)". *Indian Fern J.* 22: 1–6.

Abstract: In this paper efforts have been made to prove that the ferns and fern-allies are not affront but their bounteous uses have been listed. Species used as food, vegetables, medicines and other domestic purposes in central Himalaya, have been highlighted. Strategies to popularise these plants would enable the local people to raise the source of their livelihhod.

1366. **Kholia, B.S. & Sharma, S. 2018.** "*Asplenium phyllitidis* D. Don, a conservation priority fern of Uttarakhand Himalayas". *Indian J. Forest.* 41(2): 199–203.

Abstract: During British time, *Asplenium phyllitidis* D. Don was known to occur in different localities of Gori and Ramganga valleys of district Pithoragarh of Kumaun region, Uttarakhand but now it is restricted in to a single locality. Therefore, this rare and endangered fern of Uttarakhand needs conservation at regional level. In present communication, its distribution, threats and conservation in Kumaun are discussed in detail.

1367. **Khulbe, R.D. 1979.** "*Pythium* in some lakes of Nainital". *Geobios* 6: 335.

Abstract: Four species of *Pythium* viz., *P. monospermum* Pringsheim, *P. afertile* Kanouse & Humphrey, *P. proliferum* de Bary and *P. undulatum* Peterson were present in two temperate lakes, Nainital and Sariya Tal and three subtropical lakes, Khurpa Tal, Bhim Tal and Naukuchiya Tal and reported for the first time from temperate and subtropical lakes of India. *P. afertile* was found to be the new record for the country.

1368. **Khulbe, R.D. 1982.** "*Geolegnia inflata* Coker & Harvey- A new record for Indian aquatic fungi from Nainital". *Geobios, New Rep.* 1: 35–36.

Abstract: *Geolegnia inflata* Coker & Harvey, has been recorded for Indian aquatic fungi from moist soil of Haldwani, Nainital.

1369. **Khulbe, R.D. & Sati, S.C. 1979.** "A new record of watermold from Nainital". *Geobios* 6: 229. 1979.

Abstract: *Brevilegnia diclina* Harvey, which is found to be the new record for India from temperate soils of Jeolikot, Nainital.

1370. **Khullar, S.P. 1984.** "The ferns of Western Himalaya– A few additions, corrections and annotations". *Indian Fern J.* 1: 89–95.

Abstract: Recent fern gatherings have added 13 more species to the Indian portion of the W. Himalaya. It is suggested that on taxonomical and nomenclatural considerations, the following species, as they are known from their type localities, does not occur in this region. These are *Athyrium filix-femina* (L.) Roth, *Diplazium polypodioides* Blume, *Lepisorus excavates* (Bory) Ching, *L. thunbergianus* (Kaulf) Ching and *Phymatopteris hastata* (Thunb.) Pic. Ser. A new species, *Lepisorum tenuipes* Ching & Khullar, has been described; *Cheilanthes breviforns* (Khullar) raised to species rank and a new combination, *Lunathyrium macdonelli* (Beddome) Khullar, has been made.

1371. **Khullar, S.P. & Sharma, A. 1991.** "A new species of the genus *Elaphoglossum* from the Kumaun Himalaya". *Indian Fern J.* 8: 1–4.

Abstract: A new species of the genus *Elaphoglossum*, viz., *E. pangteyii* collected from the Kumaun Himalaya is described. It has rhizome and rhizome scale features midway between *E. marginatum* and *E. conforme*.

1372. **Khullar, S.P., Punetha, N. & Kholia, B. 1988.** "The species of the genus *Dryopteris* in the Pithoragarh district of Kumaon (W. Himalaya)". *Indian Fern J.* 5: 127–135.

Abstract: The Pithoragarh district of Kumaon (Uttar Pradesh, India) has been surveyed for the species of the genus *Dryopteris*. A total of 15 species have been collected from here. A field key for ready field identification, short taxonomic notes and distribution data for all species have been given.

1373. **Khullar, S.P., Sharma, M.P. & Chadha, J. 2005.** "A re-appraisal of the ferns of Mussoorie and Dehra Dun, Uttaranchal". *Indian Fern J.* 22: 14–42.

Abstract: Fern vegetation of Mussoorie and Dehra Dun has very frequently been explored during the past about 100 years. Vast changes have taken place in the flora content. A large number of species collected by eachie explorers have been lost since these were never found again.

1374. **Khullar, S.P., Pangtey, Y.P.S., Samant, S.S., Rawal, R.S. & Rawat, G.S. 1991.** *Ferns of Nainital*. Bishen Singh Mahendra Pal Singh, Dehra Dun.

1375. **Kumar, A. & Joshi, H.K. 1989.** "Some new host records of fungi from India". *Geobios, New Rep.* 8: 76–77.

Abstract: Seventeen species of fungi thriving on some fodder plants and trees in C.R. Farm of IGFRI, Jhansi have been reported to be associated with the respective hosts and are new fungal host combinations for India.

1376. **Kumar, A. & Kazmi, S. 2004.** "Bryophytes from Unchaahar, Raebareli, U.P.". *Geophytology* 34: 121–123.

1377. **Kumar, A. & Kazmi, S. 2006.** "Leaf area indices of mosses from Unchahar, Raebareli, U.P." *Geophytology* 36: 23– 26.

1378. **Kumar, B. & Pande, H.C. 2010.** "An enumeration of ferns of Pauri district, Uttarakhand". *Ann. Forest.* 18(1): 115–122.

Abstract: The present paper deals with 91 species of ferns belonging to 37 genera under 23 families collected from Pauri district of Uttarakhand state. Each species is provided with correct binomial name and basionym (if any). Nomenclature has been made up-to-date.

1379. **Kumar, B. & Upreti, D.K. 2008.** "An account of lichens on fallen twigs of three *Quercus* species in Chopta Forest of Garhwal Himalayas, India". *Ann. Forest.* 16(1): 92–98.

Abstract: The association of epiphytic lichens on the fallen twigs on three common *Quercus* species viz., *Q. semecarpifolia, Q. floribunda* and *Q. leucotrichophora* from the moist temperate forest of Chopta region, Rudraprayag district of Garhwal Himalaya has been discussed. *Q. semecarpifolia* exhibits the maximum growth of lichens on its twigs represented by 29 species followed by *Q. floribunda* and *Q. leucotrichophora* with 16 and 12 respectively. The twigs of diameter classes more than 4.1 cm in *Q. semecarpifolia* and *Q. floribunda* bear the maximum individuals of lichens represented by 148 and 71, while in *Q. leucotrichophora* the twigs 3.1-4.0 diameter class exhibit maximum 82 individuals. All the three oak species exhibit luxuriant growth of Parmelioid lichens on their twigs.

1380. **Kumar, B., Joshi, P., Kholia, B.S. & Srivastava, S.K. 2015.** "Extended distribution of the least moonwort, *Botrychium simplex* E. Hitchcock". *Indian J. Forest.* 38(3): 241–243.

Abstract: In the present communication the least moonwort, *Botrychium simplex* E. Hitchcock is reported for the first time from Western Himalaya from Rishiganga valley, Garhwal. Previously this species was reported from Sikkim.

1381. **Kumar, S. & Singh, D.K. 2002.** "Contribution to the mosses of Govind National Park, Uttaranchal, India". *Bull. Bot. Surv. India* 44(1-4): 119–134.

Abstract: The paper deals with the morphotaxonomical studies of nine species of mosses, viz., *Atrichum undulatum* (Hedw.) P. Beauv. var. *hausknechtii* (Jur. & Mild.) Frye (Poytrichaceae), *Macromitrium moorcroftii* (Hook. & Grew.) Schwaegr. (Orthotrichaceae), *Timmia megapolitana* Hedw. (Timmiaceae), *Pohlia gedeana* (Bosch & Lac.) Gangulee (Bryaceae), *Bartramidula bartramioides* (Griff.) Wijk & Marg. (Bartramiaceae), *Clapodium prionophyllum* (C. Muell.) Broth. (Thuidiaceae), *Plagiothecium neckeroidium* B.S.G. (Plagiotheciaceae), *Hypnum cupressiforme* Hedw. (Hypnaceae) and *Regmatodon orthpstegius* Mont. (Leskeaceae) from Govind National Park in Uttarkashi district of Uttaranchal, India. This constitutes the first record of bryophytes from this protected area situated in the Garhwal Himalaya. *Pohlia gedeana* (Bosch & Lac.) Gangulee, so far known from Bhutan and Indo-Malayan region, has been recorded for the first time from India.

1382. **Kumar, S. & Suseela, M.R. 2004.** "Fresh water algal variation of river Gomti at three different sites in winter months". *J. Econ. Taxon. Bot.* 28(2): 398–402.

Abstract: The preset communication deals with the freash algal variation at three sites of river Gomti. A total of 85 algal taxa belonging to Cyanophyceae (26), Chlorophyceae (12) and Bacillariophyceae (47) were identified.

1383. **Kumari, A. & Tripathi, K.P. 2007.** "Phytosociological studies of the pteridophytes in Tarai forest of North India". *Indian J. Forest.* 30(4): 445–450.

Abstract: Tarai forest of Balmikinagar district West Champaran of Bihar and Kusumi forest, district Gorakhpur of Uttar Pradesh geographically located at 27°10'-27°31' NL and 83°50'-84°41' EL are situated adjacent to Indo-Nepal border and characterised as tropical deciduous forest. Species diversity and community structure of fern and fern allies were studied in these forests. These forests consist about 45 fern species belonging to 16 families in which maximum species are of the family Selaginellaceae (63%) followed by Adiantaceae (38%) and Thelypteridaceae (31%).

1384. **Kumari, D., Reddy, M.S. & Upadhyay, R.C. 2011.** "Antioxidant activity of three species of wild mushroom genus *Cantharellus* collected from North×Western Himalaya, India". *Int. J. Agric. & Biol.* (13): 415–418.

Abstract: The efficiency of antioxidant activity from *Cantharellus* species, namely *C. friessi*, *C. subcibarius* and *C. cinerius* mushrooms collected from North-Western Himalayan region of India was compared with *Pleurotus florida*. The total phenol contents of each species were analyzed in addition to some bioactive compounds. The analysis revealed that the total phenol contents showed major antioxidants components ranged from 9.55 to 16.8 mg/g in different mushrooms. The antioxidant activity by *C. friessi* was significantly higher than other mushrooms. The mushrooms investigated in the present study could represent easily accessible sources of natural antioxidant. The present study showed significant interest for the wild edible mushrooms due to the presence of natural antioxidants in them.

1385. **Kumari, P., Chamola, B.P., Govindapyari, H., Gupta, R. & Uniyal, P.L. 2015.** "Studies on diversity of soil fungi (AM) associated with bryophytes in Uttarakhand, North-Western Himalaya, India". *Ann. Forest.* 23(1): 11–19.

Abstract: The present study deals with 29 species of bryophytes and their substrate for arbuscular mycorrhizal (AM) association from different sites of a mixed temperateforest in North-Western Himalaya. AM fungi were found associated with all studied liverworts taxa, whereas fungal endophyte was rarely found in mosses. Fungal endophyte is found in stem, thallus as well as in rhizoids. Mycorrhizal colonization frequency was observed to be more in smooth-walled rhizoids as compared to tuberculate ones in liverworts. High humus content, alkaline nature of substratum, temperate mixed vegetation and moderate temperature (20°C) found to have positive effect on the degree of colonization of AM fungi. Spores of five species of *Glomus* are recognised in rhizosphere soil of the studied bryophytes.

1386. **Marten, J. 1908.** "List of ferns found at and around Mussoorie, 1908". *J. Bombay Nat. Hist. Soc.* 19(1): 179–183. Abstract: Sixty four ferns have been reported at and around the Mussoorie.

1387. **Mathur, P.N. & Sharma, G.P. 1980.** "*Dothidea puccinioides* on *Verbena officinalis* Linn. a new record from India". *Geobios* 7: 92–93.

Abstract: In the present paper *Dothidea puccinioides* Fr. was collected on the dead branches of *Verbena officinalis* Linn. from Mussoorie. *Dothidea puccinioides* Fr. is a new record for the list of Indian fungi and *Verbena officinalis* Linn. a new host.

1388. **Mehmood, T., Bhatt, R.P., Uniyal, P., Singh, U. & Chowdhary, A.K. 2018.** "Morphological and phylogenetic characterization of genus *Amanita* from Uttarakhand, India: I". *Curr. Res. Environm. & Appl. Mycol.* 8(1): 118–134.

Abstract: Four species of genus *Amanita* namely; *A. orsonii, A. rubrovolvata, A. subglobosa* and *A. hemibapha* are identified from Uttarakhand, India. Morphological details, illustrations and phylogenetic observations based on ITS and nrLSU data are given here.

1389. **Mishra, D. & Sharma, J.R. 2010.** "Community structure and dynamics of wood-rotting fungi in temperate forests". *Phytotaxonomy* 10: 88–105.

Abstract: The succession and organization of wood-rotting Basidiomycetes as indicated by their fruitbody production were studied on naturally fallen decomposing trunks of *Abies pindrows* and *Quercus semecarpifolia* in temperate Himalayan forests. Altogether 70 species of Basidiomycetes were found on *Abies* and 51 on *Quercus*. The composition of species varied with the stage of decay, history of fungal infections preceding the tree fall, and diameter and amount of bark. Probably, physical and chemical properties of the host tree species and the microclimate of the growth site govern the basic trends in the community development of wood inhabiting fungi. The initial steps in the tree trunk decomposition greatly depend on the way the tree died. Primary decayers affect the composition of the fungi at later stages of decay by opening successional pathways for specific groups of saprotrophs.

1390. **Mishra, D. & Sharma, J.R. 2012.** "Diversity in Polyporaceous mycoflora of Himalaya". *Ann. Forest.* 20(1): 125–128.

Abstract: Polypores are a dominant and economically important group of wood-rotting fungi in Himalayan forests. A summary of their diversity in different climatic zones of Himalaya is provided here. 47 genera and 351 species has been reported from Eastern Himalaya (EH) and Western Himalaya (WH). The concise account of their distribution, ecology and host specificity based on the materials studied in various Indian herbaria and the vast survey of these fungi by the authors from EH and WH during the past 30 years.

1391. **Mishra, G.K., Upreti, D.K., Nayaka, S. & Punetha, N. 2012.** "An enumeration of lichens from Udham Singh Nagar district of Uttarakhand with *Bacidia delicate* as new record for India". *Phytotaxonomy* 12: 105–108.

Abstract: The paper enumerates 28 species of lichens belonging to 17 genera and 13 families in three forest localities of Udham Singh Nagar district, Uttarakhand. The study added 6 species as new records to the state and *Bacidia delicata* (Larbal. ex Leighton) Coppins, as new record for Indian lichen biota.

1392. **Mishra, U.S., Awasthi, P.B. & Gupta, S.C. 1980.** "*Botryotrichum piluliferum* Sacc. & March.– A new record". *Geobios* 7(1): 23.

Abstract: *Botryotrichum piluliferum* Sacc. & March. recorded on decaying plant of *Cassia tora* in Rohilkhand region is a new addition to the fungi of India.

1393. **Misra, P.K. & Srivastava, A.K. 2003.** "Some desmids (Chlorophyceae) from North-eastern Uttar Pradesh, India". *J. Indian Bot. Soc.* 82: 85–92.

1394. **Misra, P.K., Prakash, J. & Srivastava, A.K. 2002.** "Filamentous green algae from Basti, Uttar Pradesh, India". *Phytotaxonomy* 2: 130–134.

Abstract: The present communication deals with 7 taxa of green algae belonging to orders Chaetophorales, Cladophorales and Zygnematales. The genera reported in this paper are *Stigeoclonium* Kuetzing, *Cladophora* Kuetzing, *Pithophora* Wittrock, *Rhizoclonium* Kuetzing, Spirogyra Link and *Zygnema* Agardh. All these forms constitute a new record for Basti district, Uttar Pradesh.

1395. **Misra, P.K., Shukla, S.K. & Chauhan, R.S. 2006.** "Some fresh-water Bacillariophycean algae from foothills of Western Himalayas". *Phytotaxonomy* 6: 111–115.

Abstract: Present communication deals with 14 taxa of two fresh-water diatom genera collected from different aquatic habitats of Lalkuan, Kathgodam and Pantnagar areas of foothills of Western Himalayas. Genus *Cymbella* Ag. is represented by 10 species while genus *Navicula* Bory has 4 species.

1396. **Misra, P.K., Mehrotra, R.K., Shukla, M. & Prakash, J. 2006.** "Some diatoms from Chilwa Lake, Gorakhpur, Uttar Pradesh". *Phytotaxonomy* 6: 4–7.

Abstract: In the present paper, 15 datoms belonging to 10 genera have been described from Chilwa lake, district Gorakhpur, U.P. The following genera have been described (The numbers of taxa of each genus are given in parentheses): *Cyclotella* Kuetzing (1), *Fragilaria* Lyng. (Rabenhorst) (1), *Achnanthes* Bory (1), *Cocconeis* Ehr. (Grunow) (1), *Navicula* Bory emend. Cleve (4), *Pinnularia* Ehr. (1), *Gyrosigma* Hassall emend. Cleve (2), *Gomphonema* C. A. Agardh (2), *Cymbella* C. A. Agardh (1), *Surirella* Turpin (1). All these forms are being reported for the first time from district Gorakhpur, U.P.

1397. **Misra, P.K., Prakash, J., Srivastava, A.K. & Singh, P.K. 2004.** "Some freshwater planktonic algae from Sant Kabir Nagar, Uttar Pradesh". *Phytotaxonomy* 4: 87–94.

Abstract: In the present paper, a total number of 17 taxa belonging to 3 classes, viz. Cyanophyceae, Chlorophyceae and Bacillariophyceae, have been described. Since no work has been done on freshwater algae of Sant Kabir Nagar, Uttar Pradesh, all the taxa constitute a new record from the area.

1398. **Misra, P.K., Tripathi, S.K., Chauhan, R.S. & Dwivedi, R.K. 2008.** "Some freshwater Bacillariophycean algae from Yamuna River, Saharanpur, Uttar Pradesh, India". *Phytotaxonomy* 8: 87–90.

Abstract: Present communication deals with 13 taxa of six freshwater Diatom genera, viz., *Cyclotella* Kuetzing (1 sp.), *Cocconies* Ehrenb. (1 spp.), *Navicula* Bory (1 var.), *Cymbella* Agardh (4 spp.), *Gomphonema* Agardh (2 spp., 3 var.) and *Nitzschia* Hassall (1 spp.) collected from lotic water body Yamuna River at Sarsawa, Saharanpur district of Uttar Pradesh. All these forms have been reported for the first time from district Saharanpur, Uttar Pradesh.

1399. **Mittal, S. & Sengar, R.M.S. 1998**. "Quantitative determination of phytoplanktons in Karwan river". *Geobios, New Rep.* 7: 106-110.

Abstract: The studies have been undertaken to know the population dynamics of the phytoplanktons in Karwar river water. In all, 67 species of phytoplanktons have been recorded, in which 1 belongs to Cyanophyceae, 35 to Chlorophyceae, 1 to Euglenophyceae and 21 to Bacillariophyceae. Among these, maximum 9 species of *Scenedesmus* followed by *Nitzschia* with 5 species were recorded at the terminal point in winter season.

1400. **Naithani, B.D. 1979.** "An interesting tree fern, *Cyathea spinulosa* Wall. ex Hook. a new record from Garhwal Himalaya". *Bull. Bot. Surv. India* 21(1-4): 186.

Abstract: *Cyathea spinulosa* Wall. ex Hook. a new record for Garhwal Himalaya from Bagwan, Nigol Valley in Chamoli district.

1401. **Naithani, H.B. & Chandra, S. 1999a.** "Tallest Chir Pine *(Pinus roxburghii)* tree of Asia". *Indian Forester* 125(3): 336–337.

Abstract: Tallest Chir Pine *(Pinus roxburghii)* tree of Asia (60.65 m high and girth 2.50 m) has been reported from Bhasla, Compartment No. 1, Sandra Range, Tons Forest Division, Uttarkashi district, U.P.

1402. **Nath, V., Asthana, A.K. & Sahu, V. 2007.** "*Fabronia secunda* Mont.– A new addition to Western Himalayas". *Indian J. Forest.* 30(3): 353–354.

Abstract: During a recent study plants of *Fabronia secunda* Mont. have been encountered from Govindghat (Valley of Flowers) for the first time, which is a new addition to the bryoflora of Western Himalaya. Plants usually grow on tree trunks and are characterised by its minute size, occurring in dense cushions with creeping stems, possessing uniformly foliate branches, oblong-lanceolate leaves, narrowed into a hair like point, margin dentate below; costa single, reaching up to the middle of leaf; seta smooth, capsule erect, ovoid; spores coarsely papillose with occasional lamellate marks.

1403. **Nath, V., Asthana, A.K. & Sahu, V. 2010.** "Enumeration of liverworts and mosses of Valley of Flowers, Garhwal hills, Uttarakhand, India". *Geophytology* 39(1-2): 49–63.

Abstract: An enumeration of 80 taxa of bryophytes of Valley of Flowers, Garhwal Hills, Uttarakhand, India has been made. It includes an account of 49 species of mosses belonging to 18 families and 30 species of liverworts belonging to 14 families. During the study, 6 liverworts, viz., *Heteroscyphus hyalinus* (St.) Srivast. & Srivast., *Pseudolepicolia trolli* (Herz.) Grolle & Ando, *Scapania ferruginea* (Lehm. & Lindb.) Gott., Lindb. & Nees, *Lepidozia stahlii* Steph., *Anastrophyllum donnianum* (Hook.) Steph. and *Jungermannia pseudocyclops* Inoue and three mosses, viz., *Brotherella curvirostris* (Schwaegr.) Fleisch., *Trachycladiella sparsa* (Mitt.) Menzel and *Trachyphyllum inflexum* (Harv.) Gepp. are newly added to the West Himalayan region in general and Valley of Flowers in particular.

1404. **Nath, V., Asthana, A.K. & Srivastava, B. 2010.** "*Hypnum macrogynum* Besch.– A new addition to West Himalayan bryoflora". *Phytotaxonomy* 10: 85–87.

Abstract: Genus *Hypnum*, belonging to family Hypnaceae of order Hypnobryales, is a pleurocarpous moss, represented in India by 7 taxa. As far as distribution of these taxa is concerned, they occur in eastern Himalaya, western Himalaya and south India. During a study on the bryoflora of Corbett National Park, *Hypnum macrogynum* Besch. Was identified on way to Rathuadhat near Vatanbasa, for the first time from western Himalaya, which is a new addition to western Himalaya, India. Earlier, this species was known from eastern Himalaya.

1405. **Nath, V., Sinha, S., Sahu, V., Govind, G., Srivastava, M. & Asthana, A.K. 2010.** "A study on metal accumulation in two mosses of Lucknow (U.P.)". *Indian J. Appl. & Pure Biol.* 25(1): 25–29.

Abstract: A study has been made on metal (Zn, Mn, Cu, Pb and Ni) accumulation in two mosses: *Semibarbula orientalis* (Web.) Wijk. & Merg. and *Hyophila involuta* (Hook.) Jaeg. collected from different sites of Lucknow in response to different anthropogenic disturbances. The concentration of the same elements were also determined in soil samples collected at the same sites, to evaluate the role of soil composition as a potential source of metal uptake by mosses. Zn showed highest accumulation in plant *S. orientalis* from Moti Mahal lawn and Ni showed low accumulation in *H. involuta* from Residency (inside). Concentration of Mn, Pb and Ni has been found higher in soil samples as compared to plant samples, with concentration of Zn and Cu was high in plant samples. Correlation analysis between metal accumulation in plants with soil emphasized that Mn, Zn and Ni showed negative correlation ($P<0.01$ and $P>0.05$) where as Pb sowed positive correlation.

1406. **Negi, H.R. 1996.** "*Usnea longissima*: The winter staple food of Musk deer: A case study of Kanchulakharak Mush Deer Breeding Centre in Garhwal Himalayas". *Tiger Paper* 23(1): 30–32.

1407. **Pande, H.C. 2004a.** "Pteridophytic floristic diversity in Corbett Tiger Reserve, Uttaranchal". *Ann. Forest.* 12(2): 243–252.

Abstract: The present paper deals with a brief taxonomic account of 46 species of pteridophytes (39 ferns and 7 fern-allies) belonging to 26 genera under 18 families collected from Corbett Tiger Reserve of Uttaranchal. A brief description of all the taxa with ecology, localities, collector's name with field number have been provided.

1408. **Pande, H.C. 2004b.** "Locality record for a rare fern *Macrothelypteris ornata* from Corbett Tiger Reserve, Uttaranchal". *Ann. Forest.* 12(2): 293.

Abstract: The tree fern, *Macrothelypteris ornata* (Wall. ex Hook.) Tryon is reported to occur in various parts of Western Himalayas as a rare species, the present finding of this species at Mujuapani hills is an interesting record.

1409. **Pande, H.C. 2007.** "Pteridophytic floristic diversity in Corbett Tiger Reserve, Uttaranchal". *J. Econ. Taxon. Bot.* 31(4): 803–811.

Abstract: The present paper deals with a brief taxonomic account of 46 species of pteridophytes (39 ferns and 7 fern-allies) belonging to 26 genera under 18 families collected from Corbett Tiger Reserve of Uttaranchal. A brief description of all the taxa with ecology, localities, collector's name with field number have been provided.

1410. **Pande, H.C. 2011.** "Ecological observations on the fern flora of Uttarakhand". *Phytotaxonomy* 11: 86–102.

Abstract: Survey of different parts of Uttarakhand was undertaken for the assessment of pteridophytic diversity. The present paper is the result of filed studies carried out during the years 1988-2011 and examination of data on herbarium sheets housed in different herbaria. Ferns of the area are divided into four major ecological categories, which are again subdivided into the subcategories. The number of species growing terrestrial habitat is the maximum, whereas the epiphytic members are comparatively fewer in numbers. Fern species live in a wide variety of habitats ranging from remote mountain elevations to dry desert rock faces, bodies of water and open fields. The composition, density and distribution of pteridophytic flora vary with altitudinal zonation, climatic condition, humidity, soil, amount of light and nature of forests.

1411. **Pande, H.C. & Pande, P.C. 1990.** "Pteridophytic flora of Mukteshwr and Ramgarh area of Kumaun Himlaya". *Vegetos 3(2)*: 132–134.

1412. **Pande, H.C. & Pande, P.C. 2002.** *Pteridology in the Western Himalaya (Kumaon)*. Bishen Singh Mahendra Pal Singh, Dehra Dun.

1413. **Pande, H.C. & Pande, P.C. 2003.** *An illustrated Fern Flora of Kumaon Himalaya 1*. Bishen Singh Mahendra Pal Singh, Dehra Dun.

1414. **Pande, H.C. & Singh, C. 2010.** "Taxonomic observation on some species of *Pteris* L. from Dehradun district of Uttarakhand". *Phytotaxonomy.* 10: 77–84.

Abstract: Detailed taxonomic studies for seven species of *Pteris* L. from Dehradun district of Uttarakhand have been made. Key for identification of these species is also provided. Phytogeographically it is observed that *Pteris vittata* L. and *P. cretica* L. are the species growing abundantly in the area. While giving the taxonomic account of each species, basionym and synonyms have also been made.

1415. **Pande, H.C. & Singh, C. 2011.** "Systematics of genus *Lygodium* Swartz in Western Himalayas". *Ann. Forest.* 19(1): 109–116.

Abstract: *Lygodium* Sw. belongs to the monogeneric family Lygodiaceae Presl *sensu strict* and comprised of 8 species in India. Out of these 8 species, 2 species namely *Lygodium flexuosum* (L.) Sw. and *L. japonicum* (Thunb.) Sw. are found in the Western Himalayas. An identification key is provided for diagnosis of both the species along with correct nomenclature.

1416. **Pande, H.C., Joshi, P. & Pande, P.C. 2004a.** "Taxonomic observation of the family Davalliaceae from Uttaranchal (Central Himalaya)". *Ann. Forest.* 12(1): 99–115.

Abstract: The present account deals with the members of the family Davalliaceae from Uttaranchal Himalaya. The current illustrated study deals with 9 species and 1 variety belonging to 4 genera namely, *Araiostegia, Davallia, Leucostegia* and *Paradavallodes*. This is the first detailed account of the family Davalliaceae from Uttaranchal.

1417. **Pande, H.C., Joshi, P. & Pande, P.C. 2004b.** "Re-report of *Peranema cyatheoides* D. Don (Pteridophyta- Peranemataceae) after 93 years (1910-2003) from Garhwal hills". *Indian J. Forest.* 26(3): 330–332.

Abstract: Detailed study revealed that *Peranema cyatheoides* D. Don was hitherto known by the only collection by P.W. Mackinnons & Mrs. Fisher during the beginning of 20th century. Hence the present collection forms rediscovery of this very interesting taxon after a long lapse of 93 years.

1418. **Pande, H.C., Joshi, P. & Pande, P.C. 2004c.** "A new site for *Acrophorus paleolulatus* Pichi-Sermolli (Pteridophyta) from Western Himalaya". *Indian J. Forest.* 27(1): 125–127.

Abstract: The present paper reports on a new locality record for *Acrophorus paleolulatus* Pichi-Sermolli (Peranemataceae), a graceful rare Western Himalayan fern with full citations, correct nomenclature, detailed description, distribution, material studied along with detailed drawing and photograph of plant.

1419. **Pande, H.C., Joshi, P. & Pande, P.C. 2004d.** "Rediscovery of a rare fern– *Dryopteris gamblei* (Hope) C. Chr. from Garhwal Himalayas". *Indian J. Forest.* 27(2): 235–236.

Abstract: The paper presents an account of a rare fern *Dryopteris gablei* (Hope) C. Chr. (Dryopteridaceae) reported from Garhwal Hills after a gap of 121 years (Gamble and Mackinnon, 1881, vide Hope). Previously it was reported from Tehri Garhwal and Jaunsar, the West Garhwal but during recent exploration of Garhwal Himalayas it is been collected from Chamoli and Rudraprayag districts, the Eastern Garhwal.

1420. **Pande, H.C., Joshi, P. & Pande, P.C. 2005a.** "Taxonomic observations of the family Thelypteridaceae from Garhwal region of central Himalaya)". *Ann. Forest.* 13(1): 93–129.

Abstract: The present manuscript deals with the detailed taxonomic studies on 12 genus, 12 species and 1 subspecies belonging to the family Thelypteridaceae, critical notes (wherever essential), ecological habitat and distribution is also provided. This is the first detailed account of the family Thelypteridaceae from Garhwal Himalayas.

1421. **Pande, H.C., Joshi, P. & Pande, P.C. 2005b.** "*Lepisorus oligolepidus* (Bak.) Ching (Pteridophyta: Polypodiaceae)– A rare fern re-reported from Western Himalayas (Uttaranchal)". *Ann. Forest.* 13(1): 175–177.

Abstract: *Lepisorus oligolepidus* (Bak.) Ching has been rediscovered after gap of 101 years from Gwaldam, Chamoli district, earlier reported from Mussoorie, Dehra Dun district. This rare fern is also a new report from the district of Chamoli.

1422. **Pande, H.C., Joshi, P. & Pande, P.C. 2005c.** "Rediscovery of a rare fern– *Ctenopteris subfalcata* Blume ex Kunze (Grammitaceae) from Garhwal Himalaya". *Ann. Forest.* 13(2): 287–290.

Abstract: The paper embodies an account of *Ctenopteris subfalcata* Blume ex Kunze, rediscovered after 121 yearss from Chamoli district (Uttaranchal) of Garhwal Himalaya. A brief account of its habit, habitat and ecology along with illustrations have been provided.

1423. **Pande, H.C., Joshi, P. & Pande, P.C. 2005d.** "*Diplazium longifolium* Moore and *Dryopteris woodsiisora* Hayata: Two new records from eastern part of Garhwal Himalaya". *Indian Fern J.* 22: 115–117.

Abstract: The paper embodies a detailed account of two ferns namely, *Diplazium longifolium* Moore (Athyriaceae) and *Dryopteris woodsiisora* Hayata (Dryopteridaceae) collected in the recent exploration of Garhwal Himalayas. Out of these, the first one is a rediscovery after a lapse of 121 years. The detailed description, synonymy, taxonomic enumerations, ecology, specimens examined and distribution are provided.

1424. **Pande, H.C., Joshi, P. & Pande, P.C. 2005e.** "Systematics of the genus *Crytomium* Presl. (Pteridophyta-Dryopteridaceae) from Uttaranchal (North-West Himalaya)". *Indian J. Forest.* 28(4): 451–456.

Abstract: The paper deals with four species of the genus *Cyrtomium* Presl. occurring at Uttaranchal. C. *Macrophyllum* is a new record from Uttaranchal, whereas C. *Falcatum* and C. *Nervosum* are new records for Kumaon and Garhwal Himalayas respectively. Artificial key for identification, correct nomenclature, diagnostic features and illustrations of all the 4 species have been provided to facilitate easy identification.

1425. **Pande, H.C., Joshi, P. & Pande, P.C. 2009.** "Some new reports regarding the insect-fern relationships". *Indian J. Forest.* 32(2): 331–334.

Abstract: The present paper deals with ecological relationship of insects (Arthropoda-Animalia) with ferns (Pteridophyta-Plantae). It is based on field observations during the collection of ferns from various areas of Garhwal particularly Chamoli and Rudraprayag districts.

1426. **Pande, H.C., Joshi, P. & Pande, P.C. 2010.** "The Fern flora of ghat and adjoining localities in Chamoli district (Garhwal Himalaya)". *J. Non-Timber Forest Prod.* 17(4): 445–448.

Abstract: The paper deals with the fern flora of Ghat, a botanically rich area of Chamoli district in Garhwal Himalaya. A total of 86 species belonging to 36 genera and 22 families from the area are being reported in this communication.

1427. **Pande, H.C., Vishwakarma, M.L. & Pande, P.C. 1995.** "Pteridophytic flora of Kheti, Dania and Chamtola hills of Kumaun Himalaya". *Indian Fern J.* 11: 157–161.

Abstract: Pteridophytic flora of Kheti, Dania and Chamtola hills of Kumaun Himalaya is described. A total of 108 species of ferns and fern-allies representing 46 genera and 23 families have been enumerated. *Cheilanthes brevifrons* and *Dicranopteris linearis* var. *hirta* are reported for the first time from Almora district.

1428. **Pande, H.C., Singh, C., Kumar, B., Dwivedi, H. & Joshi, P. 2010.** "Systematics of the genus *Phymatopteris* Pic.-Serm. (Pteridophyta-Polypodiaceae) from Eastern Garhwal (Chamoli and Rudraprayag districts) of Uttarakhand state". *J. Non-Timber Forest Prod.* 17(4): 495–502.

Abstract: The paper embodies detailed taxonomic account of five species of the genus *Phymatopteris* Pic.-Serm from Eastern Garhwal of Uttarakhand state. Artificial key, correct nomenclature, diagnostic features and microphotographic illustrations of all the five species have been provided to facilitate easy identification.

1429. **Pande, N., Gupta, D., Rawat, K.K., Sahu, V. & Asthana, A.K. 2017.** Rediscovery of *Anthelia julacea* (L.) Dumort. (Marchantiophyta: Antheliaceae) from India. *Indian J. Forest.* 40(2): 173–175.

Abstract: *Anthelia julacea* (L.) Dumort., a less known plant of Indian bryoflora, has been rediscovered from Himachal Pradesh and Uttarakhand after a gap of around eight decades. The study confirms its presence in the country and also makes its first ever report from Devkyara, Govind Wildlife Sanctuary, Uttarkashi district, Uttarakhand.

1430. **Pande, P.C. 1973.** "Pteridophytic flora of Ranikhet". *Indian Forester* 99(1): 49–52.

Abstract: This study deals with the ptreidophytic flora of Ranikhet. A total of 42 species of ferns and fern allies representing 23 genera and 9 families have been enumerated.

1431. **Pande, P.C. 1985.** "Occurrence of *Peranema cytheoides* D. Don from Kumaun Himalaya". *J. Indian Bot. Soc.* 64: 277.

Abstract: *Peranema cytheoides* D. Don has been reported for the first time for Kumaon Himalaya from Shama-Dhura near Kapkot, Almora district.

1432. **Pande, P.C. 1989.** "Contribution to the fern flora of Almora district". *Geobios, New Rep.* 8: 103–110.

Abstract: The paper gives an account of the ferns of Almora district. A otal of 56 genera and 124 species in 27 families are listed. Of these *Pseudocylosorus ochthodes* (Kunze) Holtt. & Grimes is a new record for Kumaun Himalaya and fours species are new to Almora district (marked by asterisk).

1433. **Pande, P.C. 1990.** "A census of Kumaun ferns (North-Western Himalaya)". *Indian Fern J.* 7: 140–195.

Abstract: All the species of ferns recorded from Kumaun Himalaya, are listed. A total of 322 species, representing 93 genera and 37 families have been enumerated. These include three new ferns viz., *Athyrium kukkonenii* Viane, Rasb. Reichstein, *Asplenium tenuicaule* Hayta var. *indopakistanicum* Reichstein and *Lepisorus khullarii* Pande & Shing. Distribution data for Kumaun Himalaya is provided for each species. As many as 25 taxa marked with an asterisk have not collectedreported from this region fter 1906.

1434. **Pande, P.C. 1991.** "Gymnospermous flora of Almora district of Kumaun Himalaya". *Vegetos* 4(182): 33–35.

1435. **Pande, P.C. 1992.** "Ferns of Almora district (Western Himalaya)– An updated list". *J. Econ. Taxon. Bot.* 16(2): 401–417.

Abstract: The paper gives an account of the ferns of Almora district (Western Himalaya). In all 181 species are estimated from this district on the basis of collections made by the author during 1981-1985 coupled with previous records. The genus and species are arranged alphabetically within a family with correct nomenclature. Notes on habitat, exact localities of occurrence and field number of each secies with collectors name is appended to every species enumerated. *Arthromeris himalayensis* (Hook.) Ching is recorded for the first time from North-Western Himalaya.

1436. **Pande, P.C. & Basera, P.S. 1988.** "Pteridophytic flora of Berinag hills (Western Himalaya)". *Indian Fern J.* 5: 150–161.

Abstract: This paper describes the pteridophytic flora of Berinag hills in Pithoragarh district, a region hitherto not botanically surveyed, 80 species (40 genera) of ferns and 5 species (3 genera) of fern allies have been enumerated. The ecological distribution of each species is also studied.

1437. **Pande, P.C. & Basera, P.S. 1989.** "*Coniogramme falcata* (Don) Salom (Hemionitidaceae): a new record for North Western Himalaya". *Acta Bot. Ind.* 17: 233.

1438. **Pande, P.C. & Bhandari, K. 1994.** "Pteridophytic flora of Roopkund (Garhwal Himalaya". *Indian Fern J.* 11: 20–26.

Abstract: The paper deals with the pteridophytic flora of Roopkund hills hitherto not surveyed. A total of 78 species have been recorded (fern-allies: 3 species and ferns:

75 species). *Polystichum braunii* (Spnner) Fee is a ew report from India. Further, *Mecodium javanicum* (Spr.) Copel., *Metapolypodium manmeinse* (Christ) Ching, *Polypodioides niponica* (Mett.) Ching and *P. subamoena* (Clarke) Ching are new records for Garhwal Himalaya and *Pyrrosia beddomeana* (Gies) Ching, *P. flocculosa* (Don) Ching, *Pronephrium peningianum* (Hook.) Holtt. for Chamoli district.

1439. **Pande, P.C. & Bir, S.S. 1985a.** "Occurrence of *Onychium fragile* Verma et Khullar from Kumaun Himalaya". *J. Bombay Nat. Hist. Soc.* 82(2): 441.

Abstract: *Onychium fragile* Verma et Khullar has been reported for the first time for Kumaun Himalaya from Jageshwar in Almora district. This species is so far been reported only from Kashmir and Mussoorie.

1440. **Pande, P.C. & Bir, S.S. 1985b.** "Present assessment of rare and threatened vascular cyrptogams (Pteridophytes) of Kumaun Himalaya and their conservation strategies". *Indian Fern J.* 11: 31–48.

Abstract: Vascular cryptogams constitute an important component of Kumaun flora. On a conservation estimate about 380 species of ferns and fern-allies are reported from Kumaun Himalaya. Out of these, 22 taxa are endemic and 135 taxa are rare and endangered plants of this region. As many as 20 species have not been collected from this region since the beginning of the present century. Rest of the taxa are either known by 1-2 collection or are very rare in this region. Keeping this fact in mind the conservation strategies are suggested.

1441. **Pande, P.C. & Dashila, R.S. 1988.** "Ferns of Kunapokhari, Nachani and Munsyari hills of Kumaun Himalaya". *Indian Fern J.* 5: 78–88.

Abstract: The paper describes the fern flora of Kunapokhari, Nachani and Munsyari hills, hitherto not botanically surveyed. A total of 104 species of ferns have been enumerated. The ecological distribution of each species is also studied.

1442. **Pande, P.C. & Joshi, P. 2005.** "Gymnospermous flora of Kumaon Himalaya– A census". *J. Econ. Taxon Bot.* 29(2): 356–363.

Abstract: The paper deals with the gymnospermous flora of Kumaon Himalaya, 26 species of gymnosperms representing 17 genera belonging to 9 families have been enumerated.

1443. **Pande, P.C. & Kandpal, M.M. 1986a.** "Pteridophytic flora of Didihat (W. Himalaya)". *Acta Bot. Ind.* 14(Suppl.): 115–122.

1444. **Pande, P.C. & Kandpal, M.M. 1986b.** "*Thelypteris palustris* (Salisb.) Schott– New record for U.P. hills". *J. Bombay Nat. Hist. Soc.* 83(2): 474.

Abstract: *Thelypteris palustris* (Salisb.) Schott has been recorded for the first time for U.P. hills from Deochula and sandeo near Didihat. The occurrence in Didihat locality of Pithoragarh district (Kumaun) extending its eastward limit of distribution. However, it has been reported from North India (Kashmir and Himachal Pradesh) and South India (Nigiris, Ootacamund).

1445. **Pande, P.C. & Kumar, B. 2009.** "An addition to the fern flora of Pauri Garhwal, Uttarakhand". *Indian J. Forest.* 32(3): 647–648.

Abstract: The present paper deals with 27 species, which are additions to the fern flora of Pauri district of Uttarakhand state. Each species is provided with correct binomial name and the basionym (if any). Nomenclature has been made up-to-date.

1446. **Pande, P.C. & Pande, H.C. 1990a.** "Systematics of the genus *Selaginella* from Kumaun Himalaya". *Indian fern J. 7*: 5–17.

Abstract: The paper embodies an illustrated taxonomic account of eleven species of the genus *Selaginella* from Kumaun, North-Western Himalaya. *S. ciliaris, S. delicatula, S. exigua, S. miniatospora* and *S. pennata* are new records for North-Western Himalayas and *S. subdiaphana* for Kumaun Himalaya. In addition, ecological observations have lso been made alongwith detailed distributional data.

1447. **Pande, P.C. & Pande, H.C. 1990b.** "An enumeration of pteridophytes of Shyamtal hills of Kumaun Himlaya". *Vegetos 3(2).*

1448. **Pande, P.C. & Pande, H.C. 1991a.** "Pteridophytic flora of Kumaun Himalaya: Additions and corrections". *Indian Fern J.* 8: 24–30.

Abstract: Included in the present enumeration are 34 species arranged in 20 genera and 15 families which constitute a supplementary list of ferns and fern-allies of Kumaun Himalaya. With the above additions the total number of ferns and fern-allies from Kumaon region comes to 354 and 32 species respectively. Some corrections are also incorporated in the previous account of the region.

1449. **Pande, P.C. & Pande, H.C. 1991b.** "Name changes in Kumaun ferns described by J.F. Duthie in his 'Catalogue of Plants of Kumaun'". *Indian Fern J.* 8: 52–66.

Abstract: The paper deals with up-dated nomenclature of taxa of ferns nd fern-allies described by J.F. Duthie in his 'Catalogue of Kumaun Plants'.

1450. **Pande, P.C. & Pande, H.C. 1993a.** "Systematics and distribution of epiphytic pteridophytic flora of Kumaun Himalaya". *Indian Fern J.* 10: 17–29.

Abstract: The pteridophytic flora of Kumaun Himalaya has been studied by several botanists in the past and the present. But only a few paid special emphasis on the systematics, ecological adaptations and distribution of the epiphytic elements occurring in the area. The present paper attempts to remove such a lacuna, through the authors' own observations, supplemented by reports in literature.

1451. **Pande, P.C. & Pande, H.C. 1993b.** "Observations of the distribution of tree fern in Western Himalaya". *Indian Fern J.* 10: 73–74.

Abstract: The distribution of a rare tree fern, *Alsophila spinulosa* (Wall. ex Hook.) Tryon in the Western Himlaya has been recorded. Unplanned way of exploitation of fronds by the local inhabitants for thatching the roofs and craze for collection of rare and endangered plants are one of the major causes of its rarity in this region. Immediate attention should be paid for its protection.

1452. **Pande, P.C. & Pande, H.C. 1993c.** "Two species of *Polypodium* L. (Polypodiaceae), new records for Western Himalayas". *Indian Fern J.* 10: 108–112.

Abstract: Two rare species of *Polypodium* namely *P. manmeiense* Christ and *P. niponicum* Mett. were not recorded earlier from any locality in the Western Himalayas. Occurrence of these species from Kumaun Himalaya has been recorded.

1453. **Pande, P.C. & Pande, H.C. 1994.** "A second list of species and genera of vascular cryptogams not included in J.F. Duthie's catalogue of plants of Kumaon". *J. Econ. Taxon. Bot.* 18(3): 667–676.

Abstract: The summary list of additions to the Kumaon pteridophytes is presented. Included are 104 species in 44 genera and 22 families.

1454. **Pande, P.C. & Pande, H.C. 2002.** "An updated catalogue of ferns and fern allies of Garhwal Himalayas". *Indian J. Forest.* 25(4): 486–498.

Abstract: The present paper deals with 347 species of pteridophytes recorded from Garhwal Himalaya belonging to 86 genera and 39 families. The genera are arranged alphabetically with correct nomenclature.

1455. **Pande, P.C. & Pande, T.D. 1987.** "An enumeration of ferns of Binsar (W. Himalaya)". *Acta Bot. Ind.* 15: 101–103.

1456. **Pande, P.C. & Pangtey, Y.P.S. 1987.** "New records of fern-allies from Kumaun Himalaya". *Indian J. Forest.* 10(2): 151–152.

Abstract: Two species of fern-allies viz., *Selaginella adunca* A. Br. ex Hieron. and *Equisetum ramosissimum* Desf. has been recorded for the first time for Kumaun from Almora and Nainital districts respectively.

1457. **Pande, P.C. & Singh, D. 1996.** "Observations on the forking of fronds in ferns". *Indian Fern J.* 13: 30–35.

Abstract: The present study reports the occurrence of forked and abnormal fronds in 25 species of ferns collected from the Kumaun Himalaya.

1458. **Pande, P.C., Andola, B.D. & Rawat, G.S. 1984.** "An enumeration of ferns of Jageshwar area in Almora district". *Himal. Res. Develop.* 3(2): 39–40.

1459. **Pande, P.C., Joshi, P. & Pande, H.C. 2003.** "*Loxogramme porcata* Price (Loxogrammaceae), a new record for Garhwal Himalaya (Uttaranchal)". *Phytotaxonomy* 3: 63–65.

Abstract: *Loxogramme porcata* Price has been recorded as an addition to the fern flora of Garhwal Himalaya. It differs from *L. involuta* (Swartz) Presl, in having lanceolate scales, wrinkled margins of lamina (not involute) and sporangial paraphysis with a small clovate terminal cell.

1460. **Pande, P.C., Joshi, P. & Pande, H.C. 2004.** "*Loxogramme cuspidata* (Zeink) Price (Loxogrammaceae), a new record for North India". *Phytotaxonomy* 4: 107–108.

Abstract: The paper embodies an account of *Loxogramme cuspidata* (Zeink) Price, reported for the first time from the North West Himalalya-Chamoli district of Garhwal Hills. A brief account of its habit, habitat and ecology along with illustration is provided.

1461. **Pande, P.C., Pande, H.C. & Bhandari, K. 1994a.** "Further additions to the fern flora of Kumaun Himalaya". *Indian Fern J.* 11: 97–101.

Abstract: Recent ferns collections by different workers have resulted in an addition of 21 more species to the list of ferns from Kumaun.

1462. **Pande, P.C., Pande, H.C. & Bhandari, K. 1994b.** "Rediscovery of two rare species of *Woodsia* R. Br. (Woodsiaceae) from Kumaun Himalaya". *J. Econ. Taxon. Bot.* 18(2): 489–490.

Abstract: Two rare species of *Woodsia* R. Br. viz., *W. alpina* (Bolton) Gray and *W. lanosa* Hook. has been rediscovered from Kumaun Himalaya after a gap of over 86 years from Pithoragarh and Almora district respectively.

1463. **Pande, P.C., Pande, H.C. & Singh, D. 1997.** "The pteridophytic flora of Kumaun Himalaya (North Western Hiamalaya): Family- Sinopteridaceae". *J. Econ. Taxon. Bot.* 21(1): 89–98.

Abstract: The present paper deals with ten species of the Sinopteridaceae (*Cheilanthes* 8; *Notholaena* 1; *Pellaea* 1). All the species are described in detail together with ecological and distributional data.

1464. **Pande, P.C., Pathak, J.K. & Bhatt, S.D. 1991.** "Ecology of the wetland pteridophytes of Kumaon Himalaya. In: Bhatt, S.D. & Pande, R.K. (Eds.), *Ecology of the Mountain Waters*. Ashish Publishing House, New Delhi, Pp. 174–197.

1465. **Pandey, D.K. 1996.** "Coliform bacteria as an indicator of pollution in five fresh water lakes of central Himalaya in Kumaon". *Indian J. Forest.* 19(2): 118–122.

Abstract: Number of coliform bacteria of five popular lakes of Central Himalaya and those quality factors of lake water which may be influence the survival and growth of Coliforms have been studied. The analysis was carried out during 1990-1991 at bimonthly intervals. For each lake the mean value of MPN index was calculated and close relation was found between the sewage load in water bodies and coliform number determined.

1466. **Pandey, S.N. & Tripathi, A.K. 1985.** "Occurrence of *Anabaena beckii* De Toni G.B. from Kanpur (U.P.), India". *J. Econ. Taxon. Bot.* 7(1): 218.

Abstract: *Anabaena beckii* De Toni G.B. has been reported from Chandari waste water pond of Kanpur (Uttar Pradesh), earlier known from Bombay.

1467. **Pandey, S.N. & Tripathi, A.K. 1988.** "*Schizomeris leibleinii* Kuetz.– An indicator or organic pollution". *Geobios* 15: 277–278.

Abstract: *Schizomeris leibleinii* Kuetz. has been observed in the highly polluted Chandari reservoir, Ganda Nala, Allen Forest Nala and other sewage channels of Kanpur city. The growth of this secies particularly in running, organically polluted water shows that it can tolerate high pollution.

1468. **Pandey, U.C. & Gangwar, F.C. 1996.** "Chlorococcales of Bareilly–I". *Phykos* 25: 144–147.

1469. **Pandey, U.C. & Habib, I. 1987.** "Desmids of Bareilly– I". *J. Indian Bot. Soc.* 66: 291–296.

Abstract: The paper deals with the taxonomic consideration of 32 taxa of Desmidiaceae belonging to 8 genera, of which 3 taxa have been described for the first time from India. These are *Cosmarium conspersum* Ralfs var. *scotia* Croasdale, *C. cucurbitium* (Biss.) Luethem var. *subpolymorphum* Nordst and *C. subcrenatum* Hantz forma *minor*. Taxa recorded here include *Closterium, Pleurotaenium, Euastrum, Cosmarium, Staurastrum, Hyalotheca, Spondylosium* and *Desmidium*.

1470. **Pandey, U.C. & Habib, I. 1989.** "On a species of *Acrochaetium* growing in Bareilly (U.P.), India". *Geobios, New Rep.* 8: 84–85.

Abstract: A fresh water alga, *Acrochaetium godwardense* has been reported first time for Uttar Pradesh from Nakatia and Dorania rivers at Bareilly. Earlier this species was reported from Balram and Koteshwar in Gujarat.

1471. **Pandey, U.C. & Pandey, D.C. 1983.** "On some desmids from Allahabad". *J. Indian Bot. Soc.* 62: 166–169.

Abstract: The paper deals with the taxonomic consideration of thirteen taxa of Desmidiaceae belonging to five genera described for the first time from India. The following genera of desmids were represented (the numbers in parentheses indicate the number of taxa of each genus) *Euastrum* (1), *Cosmarium* (1), *Staurastrum* (1); *Sphaerozosma* (1) and *Desmidium* (1).

1472. **Pandey, U.C., Habib, I. & Shukla, H.M. 1988.** "On some desmids new to Indian flora". *Geobios, New Rep.* 7: 56–58.

Abstract: Five interesting taxa of desmids viz., *Cosmarium decoratum* West & West, *C. globosum* Bulnh. var. *minor* Boldt., *C. lundellii* Delp. var. *circulare* (Reinsch) Krieger, *C. subauriculatum* W. & W. var. *subauriculatum* and *C. subcrenatum* Hantz. var. *allahabadii* have been reported first time for India from McPherson and Baghla lake, Allahabad, Uttar Pradesh.

1473. **Pandey, U.C., Habib, I. & Shukla, H.M. 1989.** "Chlorococcales new to Baroilly, India". *Geobios, New Rep.* 8: 99–100.

Abstract: In the present paper one hundred and seven taxa of Chlorococcales from Nakatia river of Baroilly of which eight species viz., *Coelastrum proboscideum* Bohlin, *C. morus* W. West & G.S. West, *C. recticulatum* (Dangeard) Senn., *C. scabrum* Reinch., *Dictyosyhaerium erenbergianum* Naegeli, *D. reniforme* Bulnh., *Dimorphococcus lunatus* Braun. and *Westella botryoides* (W. West) De Wilde are described for the first time from Uttar Pradesh, India.

1474. **Pandey, U.C., Tiwari, R.K. & Pandey, D.C. 1993.** "An enumeration of Chlorococcales from Allahabad (U.P.), India". *Biblioth. Phycol.* 66: 115–126.

1475. **Pandey, U.C., Chaturvedi, U.K., Habib, I., Shukla, H.M. & Agnihotri, A.K. 1988.** "Some desmids new to Bareilly". *J. Indian Bot. Soc.* 67: 71–73.

Abstract: The paper deals with the taxonomic consideration of 41 taxa of Desmidiaceae belonging to five genera of which 8 taxa have been described for the first time from India. Taxa include (the numbers in parentheses indicates the number of taxa) *Euastrum* (1), *Cosmarium* (24), *Closterium* (9), *Euastrum* (2), *Staurastrum* (4) and *Pleurotaenium* (2).

1476. **Pangtey, Y.P.S. 2001a.** "Further additions to the fern flora of Nainital (North-Western Himalaya)– II". *Indian J. Forest.* 24(1): 106–107.

Abstract: In the present paper, five more species of fern viz., *Loxogramme porcate* M.G. Price (Loxogrammaceae), *Asplenium khullarii* Reichst. (Aspleniaceae), *Athyrium mackinnoni* (Hope) C. Chr. *A. micropterum* Fraser-Jenk. (Athyriaceae) and *Hypodematium crenatum* (Forssk.) Kuhn subsp. *loyalii* Fraser-Jenk. & Khullar (Hypodematiaceae) belonging to four families, nor collected and recorded earlier from Nainital, are being reported as additions to the fern flora of Nainital.

1477. **Pangtey, Y.P.S. 2001b.** "A note on the collection of *Pteris stenophylla* Wall. ex Hook. & Grev. (Pteridaceae: Pteridophyta) from Nainital (North-Western Himalaya)". *Indian J. Forest.* 24(2): 229–230.

Abstract: *Pteris stenophylla* Wall. ex Hook. & Grev. has been reported for the first time from Bajoon, Nainital.

1478. **Pangtey, Y.P.S. 2004a.** "*Cornopteris quadripinnatifida* M. Kato (Athyriaceae: Pteridophyta): A new record for the West Himalaya". *Indian J. Forest.* 27(4): 339–340.

Abstract: The collection of *Cornopteris quadripinnatifida* M. Kato from Gogin, Bageshwar district, Kumaun, Uttaranchal form an interesting addition to the Fern flora of Uttaranchal in particular and the West Himalaya in general and extends its distributional range from Darjeeling and Sikkim to Uttaranchal through Nepal.

1479. **Pangtey, Y.P.S. 2004b.** "List of species of fern and fern-allies not included in Khullar *et al.* Ferns of Nainital". *Indian J. Forest.* 27(4): 391–393.

Abstract: In the present paper 20 species including one hybrid and two subspecies, spread over among 15 genera and 11 families, which have not been recorded by Khullar *et al.* has been recorded for Ferns and Fern-allies of Nainital.

1480. **Pangtey, Y.P.S. 2005a.** "Some unrecorded species of fern and fern-allies in the pteridophytes of Uttaranchal". *Indian J. Forest.* 28(1): 97–100.

Abstract: In the present paper, 12 genera spread over 19 species, 2 subspecies and 14 hybrids belonging to 16 families have been reported first time for Uttaranchal.

1481. **Pangtey, Y.P.S. 2005b.** "Note on *Metathelypteris gracilescens* (Blume) Ching (Thelypteridaceae: Pteridophyta) in the West Himalaya". *Indian J. Forest.* 28(3): 317–318.

Abstract: The report of *Metathelypteris gracilescens* (Blume) Ching from the West Himalaya is an error for *Glaphopteridopsis erubescens* (Wall. ex Hook.) Ching and therefore this species is excluded from the West Himalayan fern literature.

1482. **Pangtey, Y.P.S. & Punetha, N. 1987.** Pteridophytic flora of Kumaun Himalaya– An updated list. In: Pangtey, Y.P.S. & Joshi, S.C. (Eds.), *Western Himalayas.* 1: 390–412. Ganodaya Prakashan, Nainital.

1483. **Pangtey, Y.P.S. & Rawat, G.S. 1987.** "Some ecological observations on the fern flora of Nainital". *J. Econ. Taxon. Bot.* 9(1): 147–150.

Abstract: This paper describes an ecological observation on the fern flora of Nainital ranging from 2,611 m of altitude. Ecological groups like epiphytes, lithophytes, terrestrial and ravine ferns along with a note on seasonal changes have been discussed.

1484. **Pangtey, Y.P.S. & Samant, S.S. 1987a.** "On the recollections of some rare ferns from Nainital". *J. Econ. Taxon. Bot.* 9(2): 485–488.

Abstract: In the present paper records five rare species of ferns viz., *Botrychium ternatum* (Thunb.) Sw. (Ophioglossaceae), *Dennstaedtia scabra* (Wall. ex Hook.) Moore (Dennstaedtiaceae), *Diplazium lobulosum* Wall. ex Presl. (Dryopteridaceae), *Asplenium unilaterale* Lamk. (Aspleniaceae) and *Cyclogramma auricularia* (J. Sm.) Ching (Thelypteridaceae) from Naninital together with other relevant informations.

1485. **Pangtey, Y.P.S. & Samant, S.S. 1987b.** "A note on the recollections of *Onychium fragile* from Nainital". *J. Econ. Taxon. Bot.* 10(2): 435–436.

Abstract: The present paper records the occurrence of *Onychium fragile* Verma et Khullar from Nainital with other relevant informations.

1486. **Pangtey, Y.P.S. & Samant, S.S. 1987c.** "Additions to the pteridophytic flora of Nainital–II". *J. Econ. Taxon. Bot.* 11(1): 5–8.

Abstract: The present paper records seven species of ferns spread over in five families from Nainital with other relevant informations.

1487. **Pangtey, Y.P.S. & Tewari, L.M. 1999.** "*Selaginella vaginata* Spring (Selaginellaceae): A poorly known species in the pteridophytic flora of North-Western Himalaya". *Indian J. Forest.* 22(3): 278–280.

Abstract: *Selaginella vaginata* Spring (Selaginellaceae) has been recollected after a lapse of over a century from Bridal road, between Jeolikote and Ranibagh, Nainital, Kumaun.

1488. **Pangtey, Y.P.S., Kalakoti, B.S. & Rawat, G.S. 1985.** "Hitherto unrecorded species of *Ophioglossum* Linn. (Ophioglossaceae) from Kumaun Himalaya". *Indian J. Forest.* 8(4): 331–332.

1489. **Pangtey, Y.P.S., Martolia, G.S. & Tewari, L.M. 2010a.** "New records of ferns in the fern flora of Nainital hills". *Indian J. Forest.* 33(3): 451–452.

Abstract: *Onychium siliculosum* (Desv.) C. Chr. (Family: Cryptogrammaceae) and *Pteris wallichiana* Agardh (Family: Pteridaceae) are being reported for the first time as additions to the fern flora of Nainital hills. A brief description along with ecology and distribution in India and world are provided to facilitate for their easy identification in the field.

1490. **Pangtey, Y.P.S., Martolia, G.S. & Tewari, L.M. 2010b.** "On the recollection of two imperfectly known ferns in the fern flora of Nainital hills". *Indian J. Forest.* 33(4): 639–641.

Abstract: *Thelypteris nudata* (Roxb.) C.V. Morton and *Nephrolepis cordifolia* (L.) Trimen belonging to the family Thelypteridaceae and Oleandraceae respectively have been collected recently from the area evidently indicating their possible rarity in Nainital hills due to which they have not been recollected in the past by the early workers. This paper attempts to provide relevant information about them along with a brief description, ecology and distribution in India and world.

1491. **Pangtey, Y.P.S., Martolia, G.S. & Tewari, L.M. 2011.** "On the recollection and distribution of *Thelypteris tenera* (Roxb. in Griff.) C.V. Morton ex Fraser-Jenk. (Family: Thelypteridaceae) in the West Himalaya". *Indian J. Forest.* 34(2): 217–220.

Abstract: The present note reports the authentic recollection of *Thelypteris tenera* (Roxb. in Griff.) C.V. Morton ex Fraser-Jenk. (Family: Thelypteridaceae) from the Pithoragarh and Nainital of west Himalaya after a century. A brief description is provided to facilitate its easy identification in the field along with ecological note and distribution in India and world.

1492. **Pangtey, Y.P.S., Rawat, G.S. & Samant, S.S. 1986a.** "*Colysis pothifolia* (Ham. ex D. Don) H. Ito (Polypodiaceae) from Nainital– New record for North Western Himalaya". *J. Bombay Nat. Hist. Soc.* 83(2): 472–473.

Abstract: *Colysis pothifolia* (Ham. ex D. Don) H. Ito (Polypodiaceae) has been recorded for the first time for North Western Himalaya from Nainital.

1493. **Pangtey, Y.P.S., Rawat, G.S. & Samant, S.S. 1986b.** "Additions to the pteridophytic flora of Nainital". *J. Bombay Nat. Hist. Soc.* 83(3): 683–684.

Abstract: Six ferns and fern-allies viz., *Lycopodium setaceum* Buch.-Ham. (Lycopodiaceae), *Drynaria propinqua* (Wall. ex Mett.) J. Smith (Polypodiaceae), *Pronephrium nudatum* (Roxb.) Holttum., *Nephrolepis cordifolia* (Linn.) Presl. (Nephrolepidaceae), *Polystichum lentum* (D. Don) Moore (Aspidiaceae) and *Vittaria flexuosa* Fee (Vittariaceae) have been collected for the first time from Nainital.

1494. **Pangtey, Y.P.S., Samant, S.S. & Pande, P.C. 1987.** "A list of species and genera of ferns not included in J.F. Duthie's Catalogue of Plants of Kumaun". *J. Econ. Taxon. Bot.* 9(2): 476–480.

Abstract: A list of 30 genera, 54 species and 8 varieties of ferns has been reported new to the flora of Kumaun.

1495. **Pangtey, Y.P.S., Samant, S.S. & Rawal, R.S. 1991a.** "Addition to the pteridophytic flora of Ranikhet (Kumaun Himalaya)". *J. Econ. Taxon. Bot.* 15(3): 728–731.

Abstract: The present paper reports eighteen species of fern and fern-allies as additions to the pteridophytic flora of Ranikhet along with other relevant informations.

1496. **Pangtey, Y.P.S., Samant, S.S. & Rawal, R.S. 1991b.** "An updated list of pteridophytic flora of Ranikhet in Kumaun (western Himalaya)". *New Botanist* 18(3-4): 217–227.

1497. **Pangtey, Y.P.S., Samant, S.S. & Rawal, R.S. 1995.** "*Dryopteris pulvinulifera* (Bedd.) O. Ktze. (Dryopteridaceae): An interesting addition to the fern flora of North-Western Himalayas". *Indian J. Forest.* 18(3): 251–252.

Abstract: *Dryopteris pulvinulifera* (Bedd.) O. Ktze. has been reported for the first time for North-Western Himalaya from Pangote, near Nainital.

1498. **Pangtey, Y.P.S., Samant, S.S. & Rawat, G.S. 1985.** "*Elaphoglossum stelligerum* in the North-West Himalayas". *J. Econ. Taxon. Bot.* 6(2): 490–492.

Abstract: *Elaphoglossum stelligerum* (Wall. ex Baker) T. Moore ex Alston & Bonner has been recorded for the first time for North-West Himalayas from Bhattar, Pithoragarh district. This species is so far known from Sikkim, Assam, South India, Nepal, Bhutan, Yunnan and Indo-China. The present coolection extends its distributional range further west to Kumaun in North West Himalayas.

1499. **Pangtey, Y.P.S., Samant, S.S. & Rawat, G.S. 1989.** "A note on the distribution of tree fern *Cyathea spinulosa* Wallich ex Hook. (Cyatheaceae) in Western Himalaya". *J. Econ. Taxon. Bot.* 13(1): 106–109.

Abstract: The present note the distribution of tree fern *Cyathea spinulosa* wallich ex Hook. in the Western Himalaya has been given along with description and rarity.

1500. **Pangtey, Y.P.S., Tewari, L.M. & Upreti, K. 2009.** "*Selaginella repanda* (Desv. ex Poir.) Spring (Selaginellaceae: Pteridophyta): A new record for North West Himalaya from Nainital". *Indian J. Forest.* 32(4): 613–614.

Abstract: The present finding of *Selaginella repanda* (Desv. ex Poir.) Spring (Selaginella: Pteridophyta) is a new record is briefly described alongwith the voucher specimens examined has been given to facilitate the easy identification in the field.

1501. **Pangtey, Y.P.S., Tewari, L.M. & Upreti, K. 2012a.** "A note on the collection of *Loxogramme chinensis* Ching in the West Himalaya, India". *J. Econ. Taxon. Bot.* 36(2): 397–398.

Abstract: This note reports *Loxogramme chinensis* Ching for the first time from Bageshawr, Kumaun district, West Himalaya and thus makes important addition to the fern flora of the West Himalaya as it was previously reported only from Arunachal Pradesh and south India in India.

1502. **Pangtey, Y.P.S., Tewari, L.M. & Upreti, K. 2012b.** "Genus *Coniogramme* Fee (Hemionitidaceae: Pteridophyta) in the West Himalaya". *J. Econ. Taxon. Bot.* 36(2): 409–412.

Abstract: The present paper reports the correct number of species of the genus *Coniogramme* Fee with their nomenclature in the West Himalayan fern literature.

1503. **Pangtey, Y.P.S., Fraser-Jenkins, C.R., Tiwari, L.M. & Upterti, K. 2010.** "Ferns of Nainital, W. Himalaya: Some changes and corrections". *Indian Fern J.* 27: 152–177.

Abstract: The present paper lists of 69 species of ferns whose identify have been changed which had previously been reported from the Nainital area in Uttarakhand state. The species concerned are based on the work of Khullae *et al.* (1991) and some earlier reports and we have taken into account the work of Fraser-Jenkins (2008) while revisiting the list. Some recent additional findings have been added at the end.

1504. **Pangtey, Y.P.S., Samant, S.S., Rawal, R.S. & Dhar, U. 1995.** "*Actiniopteris radiata* (Sw.) Link (Actinopteridaceae): A poorly known species in North-Western Himalayan fern flora". *Indian J. Forest.* 18(2): 172–173.

Abstract: *Actiniopteris radiata* (Sw.) Link has been collected for the first time from a locality between Rudraprayag and Chopta in the district Chamoli Garhwal, on fully exposed rocks at about 900 m altitude.

1505. **Pangtey, Y.P.S., Samant, S.S., Rawat, R.S. & Tewari, L.M. 1992.** "A note on the recollection of a rare fern *Phegopteris connectilis* (Michx.) Watt. (Thelypteridaceae) from Kumaun (North-Western Himalaya)". *Indian J. Forest.* 15(3): 279–280.

Abstract: A rare fern *Phegopteris connectilis* (Michx.) Watt. (Thelypteridaceae) has been recollected from Kumaun (North-Western Himalayan) near Chakhuwa around 3600 m, Pithoragarh district after a gap of nearly 97 years. It also confirms the existence of this species in the Kumaun Himalaya.

1506. **Pangtey, Y.P.S., Samant, S.S., Tewari, L.M. & Upreti, K. 2012.** "*Pteris roseolilacina* Hieron. (Pteridaceae: Pteridophyta): Hitherto unknown species in the fern flora of the West Himalaya". *J. Econ. Taxon. Bot.* 36(2): 401–402.

Abstract: *Pteris roseolilacina* Hieron. Belonging to the family Pteridaceae is being reported for the first time from the West Himalaya from the eastern part of Kumaun Himalaya as a very rare fern.

1507. **Pangtey, Y.P.S., Tewari, L.M., Balutia, G. & Upreti, K. 2007.** "Additions to the fern flora of Ranikhet in Kumaon (West Himalaya)". *J. Econ. Taxon. Bot.* 31(2): 264–268.

Abstract: The present paper deals with seven species of ferns belonging to 7 genera and 6 families from Ranikhet as an addition to pteridophytic flora of Ranikhet, West Himalaya.

1508. **Pangtey, Y.P.S., Tewari, L.M., Upreti, K. & Martolia, A. 2007.** "*Pteris pellucida* Presl (Pteridaceae: Pteridophyta)– A rare taxon in Kumaon Himalaya". *J. Econ. Taxon. Bot.* 31(2): 458–459.

Abstract: The present paper deals with *Pteris pellucida* Presl, a rare taxon from Nainital. No collections could be made from Kumaun Himalaya since 1930, probably disappeared from the area.

1509. **Pant, G. & Tewari, S.D. 1982.** "*Leucobryum cucullifolium* Card and *L. nilghiriensis* C. Muell. new records for North-West Hiamalaya". *Indian J. Forest.* 5(4): 320–321.

Abstract: Two species of *Leucobryum* viz., *L. cucullifolium* Card and *L. nilghiriensis* C. Muell. has been recorded for the first time for North-West Himalaya from Almora and Nainital districts.

1510. **Pant, G.B. & Tewari, S.D. 1984.** "*Distichophyllum schmidtii* Bfroth. and *Thamnobryum latifolium* (Bosch. & Lac.) Nieuwl.– New records for India". *Indian J. Forest.* 7(2): 159–160.

Abstract: *Distichophyllum schmidtii* Bfroth. and *Thamnobryum latifolium* (Bosch. & Lac.) Nieuwl. have been reported for the first time for the Moss flora of India from Kumaon Hills.

1511. **Pant, G. & Tewari, S.D. 1989.** "Various human uses of bryophytes in the Kumaon region of N.W. Himalaya". *Bryologist* 92(1): 120–122.

Abstract: Native Himalayan highlanders of districts Almora, Nainital and Pithoragarh widely use bryophytes as medicine, insect repellents, pads, stuffing, packing, chinking material, door covering and smoke filters in the Kumaun region of Northwest Himalaya. Several of these uses, such as door covers, smoke filters and insect repellents are reported here for the first time.

1512. **Pant, S. & Gupta, R.C. 2004.** "Diversity of macrofungi of Binsar wildlife sanctuary in Kumaun, West Himalaya". *Indian J. Forest.* 27(4): 350–354.

Abstract: The present paper deals with the macrofungal diversity of the Binsar Wildlife Sanctuary (BWLS), encountered during a short trip in the month of July to September 1999. About 17 collections of macrofungi belonging to various Basidiomycetes families are described briefly.

1513. **Pant, S. & Samant, S.S. 2006.** "Diversity and distribution pattern of the pteridophytes of Mornaula Reserve Forest of Kumaun in Western Himalaya". *India Fern J.* 23: 19–27.

Abstract: Reserve forests of the Indian Himalayan region have not received much attention in view of the diversity, distribution pattern, habitat preference, rarity and conservation status of plants including pteridophytes. Therefore, the present attempt has been made to investigate the pteridophyte flora of the Mornaula Reserve Forest in Kumaun Himalaya. A total of 97 species of pteridophytes have been recorded, of tese 68 species were lithophytes and 37 species were both, lithophyes as well as epiphytes. The families, Polypodiaceae (15 species) and Athyriaceae (12 species) were the species rich families. The altitudinal distribution of ghe speces revealed that the maximum number of species (i.e. 86 spcies) were present in the altitudinal zone (1500-1800 m) and a decrease in diversity was noticed with increasing altitude. Among the habitats, shady moist habitat showed maximum species richness (ie. 53 species). Fifteen species had been identified as rare-endangered. Among the rare-endangered species, *Onychium fragile* is endemic to Indian Himalayan region and *Athyrium rupicola* is near endemic. Studies on habitat ecology, population assessment, host range of epiphytes and pressure use indices of hosts of the pteridophytes have been suggested.

1514. **Pant, V. 2002.** *Biodiversity of lichens in botanical hot spots of Pithoragarh district, Uttaranchal*. Ph. D. Thesis, Kumaun University, Nainital. (Unpublished).

1515. **Prakash, V., Agnihotri, R. & Gaur, A. 2020.** "New records of *Podoscypha multizonata* (Berk. & Br.) Pat. from Garhwal Himalayas, Uttarakhand, India". *J. New Biol. Rep.* 9(3): 284–288.

Abstract: The Garhwal region under Uttarakhand state is very rich in natural biodiversity. This region is blessed by diverge range of climate and altitudinal variations coupled with varied ecological habitats. This fungus, *Podoscypha multizonata* was collected and described from this region first time. The morphological, microscopic and cultural studies on this fungal species were conducted to evaluate its characteristics. The fruiting bodies were collected from riparian forest of Tons river, Dehradun and Asan Barrage, Chakrata, Dehradun region of Uttarakhand state, India. The survey of macro-fungi was done during the month of June-August, 2018, *P. multizonata* was observed for the first time in the region. The fruiting bodies were in the form of wrinkled sheets, fused at edges forming a rosette structure. The upper surface was matt like in texture with short sharp longitudinal ridges whereas, the lower one was pale and longitudinally wrinkled. The fruiting body appeared translucent when observed in light and after drying, it changed to patchily black colour. The macro fungal composition of this region has been studied earlier by several workers, but *P. multizonata* was never reported before. The key objective of this study was to evaluate the morphological and cultural characteristics of *P. multizonata* isolated from Garhwal hills, Uttarakhand and its *in situ* and ex *situ* conservation.

1516. **Punetha, N. 1985a.** "Taxonomic observations on some Athyrioid ferns from the Pithoragarh district of Kumaon (North West Himalaya)". *Indian Fern J.* 2: 22–31.

Abstract: Eight species of Athyroid ferns from Pithoragarh district of Kumaon region in North Western Himalaya are described. These include a new fern, *Athyrium kumaonicum*.

1517. **Punetha, N. 1985b.** "Taxonomic observations on some species of *Pteris* from Pithoragarh district of Kumaon (W. Himalaya)". *Indian Fern J.* 2: 65–72.

Abstract: A detailed taxonomic account of twelve species of the genus *Pteris* has been dealt with. Special attention has been made on *P. quadriaurita* complex and *P. nepalensis* is being recorded for the first time from W. Himalaya.

1518. **Punetha, N. 1989.** "Ecological and phytogeographical observations on the fern flora of Pithoragarh district (North-West Himalaya)". *Proc. Indian Acad. Sci.* (Pl. Sci.) 99: 327–333.

Abstract: A detailed account of ecology and phytogeography of the ferns of Pithoragarh district of Kumaon (north-west Himalaya) is discussed. Common mesophytic ferns are the species of *Adiantum, Athyrium, Cheilanthes, Christella, Dryopteris, Lygodium, Osmunda, Pseudocyclosorus* and *Pteris*. Polypodiaceous ferns are either epiphytes or lithophytes. *Ceratopteris thallictroides* is the only aquatic fern. From phytogeographical point of view it is observed that on the one hand the fern flora of this region bridges the floristics of eastern and western Himalaya, and on the other it resembles much with the fern flora of south China. About 70% ferns are common with Simla hills and 85% with Darjeeling and Sikkim Himalaya.

1519. **Punetha, N. & Kaur, S. 1987.** "Pteridophytic flora of Pithoragarh district of Kumaun (West Himalayas)". *J. Econ. Taxon. Bot.* 9(2): 269–286.

Abstract: The pteridophytic flora, with brief description of geography, climate and general vegetation of the Pithoragarh district of Kumaon has been described. District Pithoragarh which comprises eastern Kumaon (West Himalayas) has been divided into four ecological zones and it has been observed that the temperature zone with broad leaved oak forests is comparatively quite rich in fern vegetation. In the present communication 121 species of pteridophytes have been recorded of which 8 species grouped into 3 genera belong to fern allies. Remaining 113 species of ferns are grouped into 46 genera (22 families).

1520. **Punetha, N. & Kholia, B.S. 1988.** "*Vittaria himalayensis* Ching, a new record for western Himalaya". *Curr. Sci.* 57(6): 346–348.

Abstract: *Vittaria himalayensis* Ching has been recorded for the first time for western Himalaya from Kalamuni, Munsyari, Pithoragarh district.

1521. **Punetha, N. & Kholia, B.S. 1989a.** "On the identity and distribution of *Oleandra pistillaris* (Sw.) C. Chr. in India". *Bull. Bot. Surv. India* 31(1-4): 180–181.

Abstract: *Oleandra pistillaris* (Sw.) C. Chr. which is known to be common in many parts of Eastern Himalaya, but recorded here for the first time for Western Himalaya from Namik, Pithoragarh district, Kumaon.

1522. **Punetha, N. & Kholia, B.S. 1989b.** "*Pneumatopteris nudata* (Roxb.) Punetha & Kholia". *J. Bombay Nat. Hist. Soc.* 86(3): 475–477.

Abstract: A new variety of *Pneumatopteris nudata* (Roxb.) Punetha & Kholia viz., *P. nudata* var. *minor* has been described from Hachila village, Didihat, Pithoragarh district.

1523. **Punetha, N. & Kholia, B.S. 1989c.** "Addition to the pteridophytic flora of Pithoragarh district of Kumaon (W. Himalaya)". *New Botanist* 14: 115–126.

1524. **Punetha, N. & Kholia, B.S. 1990a.** "*Lepisorus pseudoclathratus* Ching & Wu, a new record for India". *Indian Fern J.* 7: 40–42.

Abstract: *Lepisorus pseudoclathratus* Ching & Wu has been recorded for the first time for India from Pithoragarh district (N.W. Himalaya). Earlier this species was recorded from Sichun and Yunnan region of China.

1525. **Punetha, N. & Kholia, B.S. 1990b.** "Two new varieties of *Christella dentata* (Forssk) Brownsey & Jermy". *J. Bombay Nat. Hist. Soc.* 87(2): 264–266.

Abstract: Two new varieties of *Christella dentata* (Forssk) Brownsey & Jermy viz., *C. dentata* var. *glabra* and *C. dentata* var. *himalayensis* has been described and illustrated from Thal and Hachila village, Didihat of Pithoragarh district, respectively.

1526. **Punetha, N. & Kholia, B.S. 1998.** "Pteridophytic flora of Kumaon Himalaya: Distribution, evolution and status". *Indian Fern J.* 15: 75–79.

Abstract: Some aspects of distribution and evolution of pteridophytic vegetation of Kumaun (central Himalaya) is provided. Though the region is generally accepted as part of west Himalaya, the pteridophytic flora resembles much with the east Himalaya flora. Comparison is also made with the neighbouring regions like south east China, the subtropical Malaya and far west Himalaya. Deforestation, road construction and establishment of new human settlements are considered as important factors affecting adversely the richness of this group of plants. In agreement with other authors, it is concluded that the pteridophytes of Kumaun must have evolved and spreaded with the ulistment of the Himalaya. The epiphytic species, however, would have evolved relatively late.

1527. **Punetha, N. & Sen, A. 1989.** "Cytological observations of some species of *Pteris* L. from Kumon (west Himalaya)". *Proc. Indian Acad. Sci.* (Pl. Sci.) 99(2): 131–134.

Abstract: The paper deals with the cytology of 10 taxa of 8 species of the genus *Pteris* L. from Kumaon in northwest Himalaya. *Pteris biaurita* and *Pteris dactylina* ate apogamous triploids (n=87), *Pteris excelsa* and *Pteris quadriaurita* are sexual diploids (n=29), whereas *Pteris vittata* is a sexual tetraploid (n = 58) and *Pteris stenophylla* is an apogamous diploid (n=58). *Pteris cretica* is represented by diploid (n=58) and triploid (n=87) apogamous races. *Pteris wallichiana* is normally sexual diploid (n = 29) but an apogamous diploid (n=58) form from this area is a new record. Sexual mode of reproduction is observed in 40% taxa whereas 60% are apogamous.

1528. **Punetha, N., Bhakuni, K. & Punetha, R. 2011.** "Phenology of the 'Royal Fern' from Kumaon Himalaya and its bearing on the identity and taxonomy of the species". *Indian Fern J.* 28: 41–47.

Abstract: Based on extensive surveys of live populations of the 'Royal Fern' from Kumaun Himalaya (central Himalaya) and observations made on plants grown in the fern garden, the debate regarding the identity of central Himalayan species *Osmunda* is addressed and is treated as *O. regalis* L.

1529. **Punetha, N., Punetha, R. & Bhakuni, K. 2007.** "Wealth of ferns nd fern allies in the Botanical Garden at Pithoragarh, central Himalaya". *Indian Fern J.* 24: 54–59.

Abstract: A list of lower vascular plants grown in the fern Garden of Government Postgraduate College, Pithoragarh is provided. Brief account of habitat features of some particular species is also given. The rray of taxa is from different climatic zones of central Himalaya.

1530. **Punetha, N., Sen, A. & Kholia, B.S. 1991.** Taxonomic observations on pteridophytic flora of Pithoragarh district of Kumaun (North-Western Himalaya) Fern-allies. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent*. Vol. II (*Indian J. Forest., Addit. Ser.* 5). Bishen Singh Mahendra Pal Singh, Dehra Dun. pp. 73–89.

1531. **Punetha, P., Tewari, M. & Kaur, S. 1985.** "Taxonomic studies on the families Loxogrammaceae and Polypodiaceae of the Pithoragarh district (North West Himalayas)". *Indian Fern J.* 2: 73–89.

Abstract: Taxonomic studies of eight genera (one in Loxogrammaceae and seven in Polypodiaceae) from the Pithoragarh district of Western Himalayas have been made. Keys for the identification of these genera along with their species are also given. While giving the taxonomic account of each species basionym and synonyms have also been given.

1532. **Punetha, R., Joshi, S. & Bhakuni, K. 2019.** "Reporting *Anogramma reichsteninii* Fraser-Jenk. (Pteridaceae) from East Kumaon (West Himalaya)". *Indian Fern J.* 36: 287–290.

Abstract: Occurrence of *Anogramma reichsteninii* Fraser-Jenk. from Pithoragarh, the eastern part of Uttarakhand state, is reported, suggesting its extended distribution range in Kumaon.

1533. **Rai, I.D., Rawat, G.S. & Kholia, B.S. 2015.** "On the occurrence of *Aleuritopteris chrysophylla* (Hook.) Ching (Pteridaceae) in Uttarakhand, Western Himalaya". *Indian J. Forest.* 38(4): 361–362.

Abstract: In present communication a rare silver fern *Aleuritopteris chrysophylla* is reported for the first time for Uttarakhand Himalaya from Pithoragarh district near Ro-Ro Dhar. A taxonomic description, distribution and diagnostic features of the texon along with a photograph have been provided for easy identification.

1534. **Rajkumar, S.D., Singh, S.K., Gautam, R.P. & Srivastava, S.K. 2011.** "*Pteris vittata* Linn.: A new record of the genus *Pteris* (Pteridaceae-Pteridophyta) from Uttar Pradesh". *Int. J. Biol. Technol.* 2011(2) (Special Issue): 149–151.

1535. **Rajkumar, S.D., Srivastava, S.K., Singh, S.K. & Gautam, R.P. 2012a.** "Ethnomedicinal uses of pteridophytes of Eastern Uttar Pradesh, India". *Int. J. Biol. Technol.* 2012(1) (Special Issue): 291–294.

1536. **Rajkumar, S.D., Srivastava, S.K., Singh, S.K. & Gautam, R.P. 2012b.** "*Adiantum caudatum* Linn. and *A. peruvianum* Kl. (Adiantaceae-Pteridophyta): Two new records from Eastern Uttar Pradesh". *Indian J. Forest.* 35(4): 549–552.

Abstract: *Adiantum caudatum* Linn. and *A. peruvianum* Kl. are reported for the first time from Eastern Uttar Pradesh. With the inclusion of above two species the family Adiantaceae (Presl) Ching in Eastern Uttar Pradesh is with 4 species.

1537. **Rani, M., Pangtey, Y.P.S., Tewari, L.M., Kumar, S., Jalal, J.S., Martolia, A., Upreti, K. & Nailwal, T. 2009.** "Taxonomic studies on the family Pteridaceae Ching and Pterdaceae Ching (Pteridophyta) in Uttarakhand". *Researcher* 1(4): 15–41.

Abstract: The present work, 2 families, 2 genera and 15 species i.e. *Pteridium* (1 species) and *Pteris* (14 species) including 1 subspecies have been studied. Some of the taxa of ferns reported earlier from Uttarakhand by previous workers based on wrong identification have been placed under the heading excluded/doubtful species giving only botanical name and the reasons of their being excluded/doubtful species are based on Khullar (1994, 2000, 2001).

1538. **Rathore, D.K. & Sharma, P. 2004.** "Lichens of *Pinus* tree in Tehri Garhwal regions, Uttaranchal". *J. Econ. Taxon. Bot.* 28(2): 427–428.

Abstract: The species of lichens grow commonly on the *Pinus* tree in Tehri Garhwal area are *Parmotrema austrosinensis* (Zahlbr.) Hale and *Parmotrema pseudotinctorum* (dess Abb.) Hale. These species are discussed with their distinguishing characters and remarks on distribution.

1539. **Rawat, G.S. & Aswal, B.S. 1984.** "On the occurrence of a tree fern *Cyathea spinulosa* Wall. ex Hook. (Cyatheaceae) in Kumaun Himalaya". *Himal. Res. Develop.* 3(2): 44.

1540. **Rawat, K.K., Alam, A. & Verma, P.K. 2016.** "Checklist of mosses (Bryophyta) of Gangetic plains, India". *Bangladesh J. Pl. Taxon.* 23(2): 97–106.

Abstract: In present work authors propose Haridwar and Udham Singh district of Uttarakhand, Shahdara zone or East Delhi, Uttar Pradesh (except southern plateau region of Uttar Pradesh including Bundelkhand region and Sonbhadra district), Bihar and West Bengal (excluding Purulia, Kooch Bihar, Jalpaiguri districts and plains of Darjeeling district) as parts of 'Gangetic plains bryo-geographic' zone. An updated account of 79 taxa of mosses of Gangetic plains, representing 40 genera and 19 families, is provided. The family Pottiaceae with 17 taxa belonging to 9 genera appears most dominant and diversified family in the area while at generic level, the genus *Fissidens* (Fissidentaceae) with 19 species shows maximum diversity, followed by *Hyophila* and *Physcomitrium* each with five species.

1541. **Rawat, S., Upreti, D.K. & Singh, R.P. 2010.** "Lichen diversity in Valley of Flowers National Park, Western Himalaya, Uttarakhand, India". *Phytotaxonomy* 10: 112–117.

Abstract: 61 species belonging to 37 genera and 26 families of lichens from the Valley of Flowers National Park (VOFNP) are enumerated. Members of lichen family Parmeliaceae dominate the area with 20 species belonging to 12 genera. The bark inhabiting lichens exhibit maximum diversity with 31 species, whereas soil and rock inhabiting lichens have poor diversity. The occurrence of cyanolichens together with luxuriant growth of soil inhabiting lichens in the rea clearly indicate the moist, stable land condition of the valley. Further, the present inventory of the lichens from the valley can be used as a baseline record for future biomonitoring studies in the area, which will help in conservation and land management practices of the valley.

1542. **Rawat, S., Upreti, D.K. & Singh, R.P. 2013a.** "Lichen diversityof Dumri forest in Chamoli district, Uttarakhand". *J. Econ. Taxon. Bot.* 37(2): 223–231.

Abstract: A total of 38 lichen species belonging to 21 genera and 12 families were recorded from the Dumri forest area of which 8 lichen species has medicinal importance. The lichen families Parmeliaceae with 8 genera belonging 12 species and Physciaceae with 3 genera belonging 7 species dominates the area followed by Pertusariaceae with 5 species with single genera and Verrucariaceae with 2 genera belonging 2 species. In Dumri forest Parmelioid and Physcioid lichen exhibit their luxuriant growth on *Pinus roxburghii* and *Quercus leucotrichophora* trees.

1543. **Rawat, S., Upreti, D.K. & Singh, R.P. 2013b.** "Lichen diversity, distribution and its medicinal properties in Joshimath-Jogidhara-Lata Gursu Forest, Garhwal Himalaya, Uttarakhand, India". *J. Econ. Taxon. Bot.* 37(4): 647–653.

Abstract: This is the first report of occurrence and distribution of lichen species from Joshimath-Jogidhara-Lata Ghursu. 67 species belonging to 32 genera and 15 families of lichens are enumerated from Joshimath-Jogidhara-Lata Ghursu forest. Members of lichen family Parmeliaceae dominant with 32 species belonging to 12 genera. The bark inhabiting lichens exhibit their maximum diversity with 45 species and 31 species of lichens equally inhabit in rock and soil. In the Joshimath-Jogidhara-Lata forest Parmelioid and Physcioid lichen exhibit their luxuriant growth on *Pinus roxburghii* and *Abies pindrow* trees. Out of the 67 species of lichens, 16 species have medicinal properties. 50 percent of Parmeliaceae family lichens having medicinal properties. In different aspects uses of 16 medicinal lichens species in India in which 11 species having traditional medicine, 7 antimicrobial activity and 2 antioxidant/tyrosinase inhibition from the localities. One of the species *Xanthoria parietina* (L.) Th. Fr. having three aspects of medicinal lichens properties. Traditional medicine and antimicrobial activity combination have common in *Everniastrum cirrhatum* (Fr.) Hale ex Sipaman, *Flavoparmelia caperata* (L.) Hale and *Parmotrema reticulata* (Taylor) M. Choisy. The record of 67 species in area is higher in first enumeration although the study conducted in area about 380 sq. km. This baseline information on lichen species in the localities will be useful for conservation policy formulation, pharmacological, bioprospection and biomonitoring studies keeping in view of global warming and climate change.

1544. **Sachan, S.N. & Chatterjee, R. 1978.** "A new host of *Uredo callicarpae* Petch from India". *Indian J. Forest.* 1(4): 310.

Abstract: *Uredo callicarpae* Petch parasitizing the leaves of *Duranta plumieri* Jacq. for the first time from Dehra Dun. This is the first record of the species on *Duranta*.

1545. **Safeer, R. & Sharma, J.R. 2012.** "Some pathogenic wood-rooting fungi of Rajaji National Park, Uttarakhand". *Indian J. Forest.* 35(1): 115–118.

Abstract: The present paper deals with the study of wood-rotting fungi which usually grow parasitically on some tree species and cause them serious damage from Rajaji National Park, Uttarakhand. The data is based on collections made from August 2009 to July 2011. The paper includes 25 species of wood-rotting fungi under 12 genera.

1546. **Sahai, R. 1962.** "Occurrence of *Anthoceros crispulus* (Mont.) Douin in Gorakhpur". *Curr. Sci.* 31(12): 519–520.

1547. **Sahu, V. & Asthana, A.K. 2015.** "Bryophyte diversity in Terai regions of Uttar Pradesh, India with some new additions to the state". *Trop. Pl. Res.* 2(3): 180–191.

Abstract: An investigation of the Bryophytes from Terai region of Uttar Pradesh has revealed the occurrence of 29 species of bryophytes: 21 species belonging to 16 genera of 11 families of Mosses; 6 species belonging to 3 genera of 3 families of Liverworts and 2 species belonging to 1 genus of 1 family of Hornworts. This includes several new reports viz., *Notothylas kashyapii* D.K. Singh from Gangetic Plains, *Dicranella macrospora* Gangulee, *Entodontopsis tavoyense* (Hook. ex Harv.) W.R. Buck & R.R. Ireland, *Trachyphyllum inflexum* (Harv.) Gepp., *Weissia controversa* Hedw., *Fissidens crenulatus* Mitt., *Fissidens flaccidus* Mitt. and *Fissidens zollingeri* Mont. from Uttar Pradesh.

1548. **Sahu, V. & Asthana, A.K. 2017.** "A rare moss *Grimmia nepalensis* Mitt. (Bryophyta) new to India". *Indian J. Forest.* 40(4): 323–325.

Abstract: During investigation on the bryophytes of the Govind Wildlife Sanctuary, Uttarkashi district of Uttarakhand, *Grimmia nepalensis* Mitt. Has been identified for the first time from this region. It is a new record for India and has been collected after about 150 years since its original collection from Nepal. This species is endemic to the Himalaya.

1549. **Saini, S.S. & Atri, N.S. 1984.** "Studies on North-West Himalayan Russulaceae". *Geobios, New Rep.* 3: 4–6.

Abstract: In this paper 24 species of *Russala* Pers. ex S.F. Gray and 5 species of *Lactarius* Pers. ex S.F. Gray which are associated with the deciduous, coniferous and mixed woodlands in the North Western Himalayas are listed.

1550. **Samant, S.S. & Pangtey, Y.P.S. 1990a.** "New records of some ferns for Kumaun Himalaya (Western Himalaya)". *J. Bombay Nat. Hist. Soc.* 87(1): 173–174.

Abstract: In the present paper five species belonging to 5 genera under 4 families turned out to be new to the fern flora of Kumaun Himalaya. The plants are *Osmunda japonica* Thunb. (Osmundaceae), *Asplenium capillipes* Makino (Aspleniaceae), *Athyrium rubricaule* (Edgew.) Bir (Athyriaceae), *Dryopteris barbigera* (Hook.) O. Ktze. and *Nothoperanema hendersonii* (Bedd.) Nakaike (Dryopteridaceae).

1551. **Samant, S.S. & Pangtey, Y.P.S. 1990b.** "Rediscovery of some rare ferns of Kumaun Himalaya (Western Himalaya)". *J. Bombay Nat. Hist. Soc.* 87(2): 333–334.

Abstract: In the present paper six species belonging to 6 genera under 4 families turned out to be new to the fern flora of Kumaun Himalaya. The plants are *Ctenopteris subfalcata* (Bl.) Kunze (Grammitaceae), *Notholaena marantae* (Linn.) Desv. (Sinopteridaceae), *Woodsia andersonii* (Bedd.) Christ. (Woodsiaceae), *Cystopteris montana* (Lam.) Berh. ex Desv., *Diplazium squamigerum* (Mett.) Christ and *Gymnocarpium dryopteris* (Linn.) Newman (Athyriaceae).

1552. **Samant, S.S., Joshi, S.C., Arya, S.C. & Pant, S. 2005.** "Diversity, distribution and conservation of pteridophytes in Nanda Devi Biosphere Reserve, West Himalaya". *Indian Fern J.* 22: 100–111.

Abstract: Most protected areas of the Indian Himalayan region have not received much attention in terms of floristic explorations. In Nanda Devi Biosphere Reserve, comprehensive studies on diversity, distribution pattern, habitat preference, rarity and conservation status of the pteridophytes have not been carried out so far. The present study has been conducted in this direction and 172 species of pteridophytes have been recorded. The altitudinal distribution of the species revealed that the maximum number of species (i.e. 127 species) were present in the temperate zone (1800-2800 m) and a decrease in diversity was noticed with increasing altitude. Among the habitats rocks/boulders/walls showed maximum species richness (i.e. 64 species). Sixty seven species had been identified as rare endangered. Among the rare endangered species *Athyrium duthiei* had been recorded in the Red Data Book of

Indian Plants. Studies on habitat ecology, population assessment, host range of epiphytes, sensitivity and pressure use indices of hosts of the pteridophytes have been suggested.

1553. **Sanyal, S.K., Devi, R. & Dhingra, G.S. 2017.** "New records of *Hyphoderma* (Meruliaceae, Polyporales) for India". *Scientific World J.* 2017: Article ID 3437916, 11 pages.

Abstract: An account of eight species of genus *Hyphoderma* (*H. clavatum, H. definitum, H. echinocystis, H. litschaueri, H. nemorale, H. subpraetermissum, H. tibia,* and *H. transiens*) is presented, which is based on collections made from Uttarakhand state during 2009–2014. All these species are cited and fully described for the first time from India.

1554. **Sati, S.C. & Khulbe, R.D. 1980.** "Occurrence of aquatic fungi in soils of Nainital hills". *Geobios* 7: 42–43.

Abstract: Eleven species of aquatic fungi belonging to Blastocladiales, Saprolegniales and Peronosporales were isolated from different soil samples which are being reported from soils of Nainital hills, for the first time.

1555. **Sehgal, D. & Sharma, J.R. 2007.** "A rare *Coltricia* from Deoban, Uttarakhand". *Indian J. Forest.* 30(4): 551–552.

Abstract: A rare *Coltricia,* viz., *C. vallata* (Berk.) Teng has been reported for the first time for Northern India from Deoban, Dehra Dun, Uttaranchal. Earlier this species was reported from Khasi Hills, Sikkim and Nepal.

1556. **Sehgal, D., Sharma, J.R. & Hembrom, M.E. 2008.** "A rare Polypore from Western Himalaya, Uttarakhand". *Indian J. Forest.* 31(4): 659–660.

Abstract: A rare Polypore, *Daedaleopsis purpurea* (Cke.) Imaz. et Aoshima has been recorded for the first time for Western Himalaya from Dhakuri forest, Bageshwar, Uttarakhand. Earlier this species was reported from West Bengal and Sikkim.

1557. **Semwal, J.K. 1984.** "Further contribution to the pteridophytic flora of Ukhimath block in Chamoli district of Uttar Pradesh". *J. Econ. Taxon. Bot.* 5(4): 973–976.

Abstract: The teridophytic flora of Ukhimath block in Chamoli district of Uttar Pradesh was explored and 70 species belonging to 38 genera and 12 families have been recorded.

1558. **Semwal, K.C., Bhatt, R.P. & Upadhyay, R.C. 2005.** "The genus *Amanita* from Garhwal Himalaya region of India". *Mushroom Res.* 14(2): 50–55.

Abstract: Three species of *Amanita* from Garhwal Himalaya region, Uttar Pradesh, India, are reported and described in detail: *A. griseofarinosa, A. sinensis* and *A. umbrinolutea*. *A. griseofarinosa* and *A. sinensis* are new records for India. *A. umbrinolutea* [*A. battarrae*] is re-described.

1559. **Semwal, K.C., Bhatt, R.P. & Upadhyay, R.C. 2006.** "Occurrence and growth characters of *Amanita* spp. in Garhwal Himalaya". *Indian Phytopathol.* 59(3): 309–313.

Abstract: An attempt has been made to correlate the growth and development of fructifications of eight *Amanita* spp. in nature with temperature and rainfall in three different forests types of Garhwal Himalaya. Average stipe elongation, pileus

diameter and life span varied with temperature and moisture and recorded more in the early season (mid- June to Aug.) than the late season (Sep. to mid- Oct.). The studies have indicated that the life span of a particular species is inversely proportional to the daily growth of *Amanita* spp.

1560. **Semwal, K.C., Tulloss, R.E., Bhatt, R.P., Stephenson, S.L. & Upadhyay, R.C. 2007.** "New records of *Amanita* section *Amanita* from Garhwal Himalaya, India". *Mycotaxon* 101: 331–348.

Abstract: Four species of Amanita from Garhwal Himalaya are described in detail and illustrated for the first time from India—A. concentrica, A. rubrovolvata, A. subglobosa, and one that is not yet named and is given a designating code, "PAK5."

1561. **Sharma, A. 2014.** "Cytology of three *Asplenium* species from Uttarakhand". *Indian Fern J.* 31: 136–138.

Abstract: Cytology of three *Asplenium* species from Uttarakhand viz., *A. nesii* Christ., *A. laciniatum* D. Don subsp. *kukkonenii* (Reichst.) Fraser-Jenk. (2008) and *A. khullarii* Reichstein & Rasbach ex Fraser-Jenk. (2008) have been studied. All three are tetraploids with n= 72. Photographs of the chromosome plates are also given.

1562. **Sharma, J.R. 2002.** "Wood-rooting fungi of temperate Himalaya– An assessment and conservation". *Indian J. Forest.* 25(2): 221–239.

Abstract: Species of wood-rooting fungi of the order Aphyllophorales form an integral part of the temperate forested Himalayan ecosystems and play the primary role of formation of forest soils by decomposition of substrates. There exists a high diversity in species composition and richness, host preference and type of wood rots caused by them. The essential but a mammoth task of studying their rich diversity has been limited by taxonomic and logistic difficulties in collecting and defining fungal species. The various difficulties like seasonal fluctuations, succession of substrates and other considerations have led to problem in assessing and documenting their diversity. Dynamics during decomposition of substrate and mechanism of its decay are also emphasized. The various threats to the wood-rooting fungi as a whole and the conservation measures required to be undertakenare also evaluated.

1563. **Sharma, J.R. & Das, K. 2001.** "Mycological trip to Pindari glacier". *Indian J. Forest.* 24(2): 239–244.

Abstract: Macrofungal diversity observed during a survey tour to Pindari Glacier in the month of September-October 1999, has been described. About 24 collections of fungi belonging to 13 species of the family Russulaceae are also described in brief.

1564. **Sharma, J.R. & Das, K. 2002.** "New records of Russulaceae from India". *Phytotaxonomy* 2: 11–15.

Abstract: Most of the species of Russulaceae are ectomycorrhizic and usually grow in association with different deciduous and coniferous trees. During survey of macrofungi, specially of Russulaceae in North Western Himalayan temperate forests, the authors came across *Lactarius indigo* (Schw.) Fr. and *Lactarius rubrifluus* Gillet. Both are new records from India and develop mycorrhizal associations.

1565. **Sharma, J.R. & Mishra, D. 2011.** "Diversity of wood-rotting fungi in temperate Himalayas". *Phytotaxonomy* 11: 103–119.

Abstract: Species of wood-rotting fungi of the order Aphyllophorales form an integral part of the temperate forested Himalayan ecosystems and play the primary role of formation of forest soils by decomposition of substrates. The temperate forests in Western Himalaya (states of Jammu & Kashmir, Himachal Pradesh and Garhwal and Kumaon regions of Uttarakhand) and Eastern Himalaya (states of Sikkim, Arunachal Pradesh and Darjeeling district of West Bengal). There exists a high diversity in species composition and richness, host preferences and type of wood rots caused by them. The essential but a mammoth task of studying their rich diversity has been limited by taxonomic and logistic difficulties in collecting and defining fungal species. The various difficulties like seasonal fluctuations, succession of substrates and other considerations have led to problems in assessing and documenting their diversity. Dynamics during decomposition of substrate and mechanism of its decay are emphasized. The various threats to the wood-rotting fungi as a whole and the conservation measures required to be under taken are also evaluated.

1566. **Sharma, J.R., Bisht, D. & Pandey, K.N. 2006.** "A new record and an incompletely known puffball from India". *Ann. Forest.* 14(2): 283–287.

Abstract: Two species of puffballs are described in detail with illustrations. *Bovista echinella* is reported for the first time from Dwarahat, Almora and Chamba, Tehri, while *Lycoperdon asperum* is hitherto known incompletely from Sheetla, Nainital, Uttaranchal, India.

1567. **Sharma, J.R., Das, K. & Kukreti, S. 2005.** "Two new records of fleshy fungi from India". *Indian J. Forest.* 28(1): 78–80.

Abstract: Two fleshy fungi viz., *Russula praetervisa* Sarnari and *Aureoboletus thibetanus* (Pat.) Hongo & Nagas are described and illustrated for the first time for India from Kumaon Himalaya.

1568. **Sharma, J.R., Pandey, K.N. & Bisht, D. 2007.** "Two new records of the genus *Bovista* Pers.: Pers. (Gasteromycetes) from India". *Bull. Bot. Surv. India* 49(1-4): 225–230.

Abstract: Two species of *Bovista* Pers.: Pers. viz., *B. oblongispora* (Lloyd) Bottomley and *B. cunninghamii* Kreisel have been reporded for the first time for India from Kalatop forest, Chama, Himachal Pradesh and Sargakhet forest, Nainital, Uttaranchal, respectively.

1569. **Sharma, M.P. 1988.** "Additions to the pteridophytic flora of Chamoli district". *J. Econ. Taxon. Bot.* 12(1): 230–232.

Abstract: The present communication enumerates 17 species (15 ferns and 2 fern-allies) of pteridophytes not included by Singh *et al.* (1986) in their publication 'Ferns and fern-allies of Chamoli district'.

1570. **Sharma, P., Semwal, D.P. & Uniyal, P.L. 2010.** Gymnosperms of Uttarakhand. In: Uniyal, P.L., Chamola, B.P. & Semwal, D.P. (Eds.), *The Plant Wealth of Uttarakhand.* Jagadambica Publishing Co., New Delhi. Pp. 305–316.

1571. **Sharma, S.C., Rajendran, A. & Goel, A.K. 1997.** "Conservation of *Microcycas calocoma* (Miq.) A. DC.– A rare and endangered Cuban cycad". *Indian J. Forest.* 20(4): 395–397.

Abstract: *Microcycas calocoma* (Miq.) A. DC., an endemic and extremely rare cycad of Cuba, is growing in the Botanic Garden of National Botanical Research Institute, Lucknow. The present study has been undertaken to highlight the significant role played by botanic gardens towards the *ex-situ* conservation of endangered species and create awareness about the preservation of such important species for the conservation of biodiversity for the posterity.

1572. **Shrestha, B.B. 2003.** "*Quercus semecarpifolia* Sm. in the Himalayan region: Ecology, Exploitation and Threats". *Himal. J. Sci.* 1(2): 126–128.

Abstract: Oaks (*Quercus* spp.) are among the dominant vascular plants of the Himalayas, ranging from the subtropical to the sub-alpine zones. They play an important role in maintaining ecosystem stability. Oaks in the Himalayan region are intimately linked with subsistence hill agriculture as they protect soil fertility, watershed and local biodiversity. They also supply fodder, leaf litter, firewood and timber. Q. *semecarpifolia* is a high altitude oak, ranging up to the timberline in the Himalayan region and forming the climax community on the southern aspect; it is considered to be one of the oldest plants of the region. It is also one of the most over-exploited species and fails to regenerate adequately either in disturbed or undisturbed natural habitat. Since plantation has not been successful, it is important to manage natural forest more effectively. This can be done by implementing sustainable methods of lopping the trees for fodder, removing an adequate number of old and dying trees to make the canopy more open, and controlling the population of cattle and wild animals that damage seedlings through browsing and trampling.

1573. **Shukla, A.N. & Mukerji, S.N. 1992.** ""*Pseudocercospora coriariae*: A new species from India". *Indian J. Forest.* 15(1): 30–31.

Abstract: *Pseudocercospora coriariae* sp. Nov. Is described and illustrated from Nainital, Uttar Pradesh. It was associated with a foliar disease of *Coriaria nepalensis*.

1574. **Shukla, H.M., Tiwari, G.L., Pandey, U.C. & Habib, I. 1990.** "Comparative studies on seasonal dynamics of epiphytic algae on two substratum plants in Mauri lake, Pratapgarh, U.P.". *J. Econ. Taxon. Bot.* 14(1): 135–138.

Abstract: While surveying the feeshwater epiphytic filamentous algal-flora from different sunstratum of Mauri lake (Pratapgarh), U.P. during August 1984 to July 1986, the authors came across 59 taxa of green and blue-green algae from 32 substratum plants. Out of these, 36 taxa were collected from *Ceratiphyllum demersum* and 41 from *Chara zeylanica*. The green algae belonged to order- Oedogoniales and Chaetophorales, while the blue greens to family Rivulariaceae. The maximum growth of these algae was noted in December on *Ceratophyllum demersum* and in November on *Chara zeylanica*.

1575. **Shukla, H.M., Tiwari, G.L., Pandey, U.C., Habib, I. & Agnihotri, A.K. 1987.** "On two nannandrous species of *Bulbochaete* Agardh, new to India". *Geobios, New Rep.* 6: 160–161.

Abstract: The present communication deals with two spcies of *Bulbochaete* Agardh, viz., *B. repanda* Hirn and *B. affinis* forma *affinis* Hirn which happen to be first records for India from Mauri Lake (Partapgarh), Uttar Pradesh.

1576. **Shukla, P., Upreti, D.K., Nayaka, S. & Tiwari, P. 2014.** "Natural dyes from Himalayan lichens". *Indian J. Tradit. Knowl.* 13(1): 195–201.

Abstract: Eleven species of lichens collected from different sites of Gharwal region of Indian Himalayas were estimated for dye production using boiling water method (BWM), ammonia fermentation method (AFM) and Di-methyl sulphoxide extraction method (DEM). The dyes extracted were tested on silk, tussar silk, absorbent cotton and a co-relation of dye colour with the lichen substance present was also made. The lichens produced orange, yellow, blue-grey, purple and brown colour dyes. The effect of sunlight and the stability of colours after washing were also determined. Lichen dyes can be used in handlooms to serve local people in their livelihood.

1577. **Shukla, V. & Upreti, D.K. 2007.** "Lichen diversity in and around Badrinath, Chamoli district (Uttarakhand)". *Phytotaxonomy* 7: 78–82.

Abstract: An enumeration of 56 species belonging to 29 genera and 18 families of lichen is provided from Badrinath area. The saxicolous, crustose lichen taxa dominate the locality, being represented by 32 species, whereas 24 species of foliose lichens have been recorded from the area. Among families Physciaceae, Parmeliaceae and Acarosporaceae dominate with 10 species (6 genera), 7 species (3 genera) and 7 species (1 genus) respectively.

1578. **Shukla, V., Nayaka, S. & Upreti, D.K. 2005.** "Enumeration of lichens in Khirsu Forest Park, Pauri Garhwal". *Phytotaxonomy* 5: 32–34.

Abstract: The paper enumerates 43 species belonging to 12 families and 24 genera of lichens from Khirsu Park of Forest Department, Pauri Garhwal.

1579. **Singh, D.K. & Semwal, R.C. 2000.** "A new species of *Notothylas* Sull. (Bryophyta) from Uttaranchal, India". *Indian J. Forest.* 23(4): 386–389.

Abstract: A new species of the genus *Notothylus* Sull., viz., *N. kashyapii* Singh has been described from Doon valley in the new created state of Uttaranchal. The species is characterised by monoecious plants with densely lamellate thalli; reticuloid stroma of chloroplast; dehiscence of capsule by transverse separation of its apical portion; 37.5-46.35 µm large, yellowish brown, finely vermiculose spores with conspicuous triradiate mark, and the total absence of columella and pseudoelaters.

1580. **Singh, D.K. & Semwal, R.C. 2001.** "A new species of *Notothylas* Sull. from Dehradun, India". *Phytotaxonomy* 1: 35–39.

Abstract: A new species of the genus *Notothylas* Sull., *N. udarii* Singh & Semwal, sp. nov. has been described from Dehradun, Uttaranchal. The species is characterised by the presence of unistratose, lamellate involucres, well-developed persistent columella and coarsely vermiulose spores with indistinct, hyaline, smooth-wavy flange and distinct hump on its distal surface.

1581. **Singh, D.K., Singh, S. & Murti, S.K. 1995.** "*Trachycarpus takil* Becc. (Arecaceae)– A rare endemic palm of Kumaon Himalaya, India". *Indian J. Forest.* 18(4): 332–336.

Abstract: The present paper the details distribution and conservation of *Trachycarpus takil* Becc has been discussed.

1582. **Singh, H. 2007.** "Himalayan Yew (*Taxus wallichiana* Zucc.): A multipurpose rare gymnosperm in India". *Indian Forester* 133(5): 690–696.

Abstract: This communication deals with the taxonomy, vernacular names, botanical description, distribution, habitat and chromosome number along with economic uses viz., edible, medicinal, ethnomedicinal, poisonous, timber, wood, dye, fuel, fodder, incense, etc. of *Taxus wallichiana* Zucc. In India. An effort has also been made to describe the chemical constituents, present status, threats, propagation, conservation and management of this rare species in detail.

1583. **Singh, J. & Devi, S. 1991.** "Pteridophyte aerospora of Lucknow". *Indian Fern J.* 8: 34–40.

Abstract: Aerospora of Lucknow, India with respect of ferns has been analysed. Botanic Gardens of NBRI showed the presence of spores of 16 ferns while the public street data was negative. Periodical observations show that *Pteris vitatai, Microsorium punctatum* and *Thelypteris augescens* spores were observed throughout the year. *Pteris vitata* plants are widely spreading in Lucknow. Spore morphology and wind movements largely effect the spore dispersal.

1584. **Singh, M., Nath, V. & Kumar, A. 2005.** "The ecological studies on bryophytes, growing on the bank of polluted river Sai (Raebareli), India". *Proc. Natl. Acad. Sci., India* 75(B): 41–50.

1585. **Singh, M., Singh, A.K., Singh, C. & Pande, H.C. 2013.** "Preliminary qualitative phytochemical studies of different extracts of *Adiantum incisum* Forssk. in Doon valley, Uttarakhand". *J. Non-Timber Forest Prod.* 20(1): 29–31.

Abstract: The present study was carried out on the phytochemical evaluation of *Adiantum incisum* Forssk. (Adiantiaceae) in Doon valley, situated in foot hills of Himalayas. Dried plant material was subjected to soxhlet extraction using seven different solvents in the increasing order of their polarity. Phytochemical screening showed the presence of alkaloids, proteins, carbohydrates, cardiac glycosides, saponins, tannins and phenols, triterpenoids in different extracts of the plant while the absence of flavonoids, steroids, fats and oils in all the extracts.

1586. **Singh, P.N. & Charaya, M.U. 1975.** "Soil fungi of a sugarcane field at Meerut 1. Distribution of soil mycoflora". *Geobios* 2: 40–43.

Abstract: While studying the soil mycoflora of a sugarcane field at Meerut, 39 fungi were isolated. Phycomycetes were mainly confined at depth D1, but most of the Deuteromycetes were present throughout. However, some forms were restricted in their distribution. Aspergilli are thermophilic because they were isolated even in summer months. Penicillia were remarkably less in number as compared to Aspergilli. *Trichoderma* was well represented. Three members of mycelia sterilia were isolated. Moisture content had positive influence on the fungal population/gm dry weight at all the depths. Decrease in fungi population per gram dry weight of soil with increasing depth was significant but the decrease in the total number of speces was highly significant. Monthly variation in the number of fungal species and population were found to be highly significant.

1587. **Singh, S. & Pande, H.C. 2007.** "Diversity of pteridophytes in district Dehra Dun (Uttarakhand)". *Indian J. Forest.* 30(4): 513–522.

Abstract: The present paper deals with 198 taxa of pteridophytes from Dehra Dun district of Uttarakhand. Location, general vegetation, brief ecological aclssification along with distributional list of these plants in different vallies of Dehra Dun is provided in table form. The information provided herewith is based on the authors own observation, coupled with the fragmented earlier published literature and specimens housed in different herbaria i.e. BSD, DD, CAL, LWG, etc. List of threatened taxa alongwith the uses of pteridophytic vegetation in the area is also provided.

1588. **Singh, S. & Rawat, G.S. 1987.** "A rare *Lycopodium* from Garhwal Himalaya". *J. Econ. Taxon. Bot.* 10(1): 206.

Abstract: A rare *Lycopodium* viz. *L. selago* L. has been reported for the first time for Garhwal Himalaya from Hemkund, Chamoli-Garhwal, Uttar Pradesh. Hitherto this species in India is known only from Sikkim and Eastern Himalaya.

1589. **Singh, S. & Singh, D.K. 1995.** "A rare *Selaginella* P. Beauv. from Kumaon Himalaya". *Indian J. Forest.* 18(2): 176.

Abstract: A rare *Selaginella* P. Beauv. viz., *S. Nepalensis* Spring has been collected for the first time for Kumaon Himalaya from Shan Dev, Pithoragarh district. This species hitherto known in India from Arunachal Pradesh, Manipur and Kashmir only.

1590. **Singh, S., Choudhary, U. & Rao, R.R. 1986a.** "Fern and fern-allies of Chamoli district". *Indian J. Forest.* 9(1): 1–15.

Abstract: The present paper deals with an enumeration of 184 pteridophytic species belonging to 68 genera and 37 families from the Chamoli district of Uttar Pradesh. The families are arranged according to Pichi Sermoli's (1977) classification.

1591. **Singh, S., Choudhary, U. & Rao, R.R. 1986b.** "Fern and fern-allies of Chamoli district". *Indian J. Forest.* 9(2): 161–167.

Abstract: The present paper deals with an enumeration of 90 pteridophytic species belonging 13 families from the Chamoli district of Uttar Pradesh.

1592. **Singh, S.K. 2013.** "A Checklist of liverworts, hornworts and mosses of Uttar Pradesh, India". *Geophytology* 42(2): 163–167.

1593. **Singh, S.C. & Srivastava, G.N. 1996.** "New records for Lucknow district, U.P.". *J. Econ. Tax. Bot.* 20(3): 645–649.

Abstract: In the present paper 34 plants species, either cultivated or running wild have been reported for the first time for the flora of Lucknow, Uttar Pradesh.

1594. **Singh, S.K. & Singh, D.K. 2002.** "Contribution to the liverworts of Gobind Natuonal Park, Uttaranchal, India". *Bull. Bot. Surv. India* 44(1-4): 99–118.

Abstract: The paper presents the result of a morphotaxonomic study on the liverworts of Govind National Park in the North-West Himalaya. A total of nine species, viz., *Plagiochila asplenioides* (L.) Dum. (Plagiochilaceae), *Porella campylophylla* var. *ligulifera* (Tayl.) Hatt., *P. hattorii* Udar & Shaheen (Porellaceae), *Pellia endivaefolia* (Dicks.) Dum. (Pelliaceae), *Metzgeria hamate* Lindenb. (Metzgeriaceae), *Targionia indica* Udar & Gupta (Targioniaceae), *Conocephalum conicum* (L.) Dum. (Conocephallaceae), *Reboulia hemisphaerica* (L.) Raddi (Rebouliaceae) and *Dumortiera hirsute* (Sw.) Reinw.,

Blume & Nees (Marchantiaceae) have been described in the present communication. This constitutes first record of liverworts from this National Park, situated in Uttarkashi district of newly created state of Uttaranchal.

1595. **Singh, S.K. & Singh, D.K. 2007.** "A preliminary census of Hepaticae and Anthocerotae of Doon valley". *Bull. Bot. Surv. India* 49(1-4): 1–14.

Abstract: Twenty eight species of liverworts and hornworts have been recorded from Doon valley. Of these, *Fossombronia pusilla* (L.) Dumort. And *Riccia cruciate* Kashyap are new record for western Himalaya. Three species viz., *Monosolenium tenerum* Griff., *Riccia frostii* Austin and *R. sorocarpa* Bisch. are new record for Uttarakhand, which 15 species are recorded for the first time from Doon valley.

1596. **Singh, S.K., Singh, D. & Singh, D.K. 2004.** "On two noteworthy liverworts from Western Himalaya, India". *Ann. Forest.* 12(1): 56–60.

Abstract: Two liverworts, *Porella perrottetiana* (Mont.) Trev. (Porellaceae) and *Pellia neesiana* (Gott.) Limpr. (Pelliaceae) have been described and illustrated from Uttaranchal in western Himalaya.

1597. **Singh, S.K., Rajkumar, D., Srivastava, S.K. & Gutam, R.P. 2015.** "Ferns of Uttar Pradesh– Dudhwa National Park- 1". *Indian Fern J.* 32: 104–123.

Abstract: The Dudhwa National Park lies in the lowdown terai of Uttar Pradesh, Indian and covers an area of 4903 sq. km., with a buffer zone of 190 sq. km.. It is part of the Dudhwa Tiger Reserve located at the Indo-Nepla border in Lakhnimpur-Kheri district, and has buffer of reserved forest areas on the northern and southern sides. It represents one of the few remaining examples of a highly diverse and productive terai ecosystem, supporting a large number of endangered species, obligate species of tall wet grasslands and species of restricted distribution in the plains of India. Botanical exploration leading to the first survey of pteridophytes of the Park was carried out and 18 species are listed and detailed.

1598. **Singh, T.C.N. 1963.** "An anatomical and ecological study of some ferns from Mussoorie (N.W. Himalaya)". *J. Indian Bot. Soc.* 42: 475–544.

Abstract: Certain morphological and ecological adaptation of nineteen species spread over nine genera of ferns has been studied in the present paper. Of these 19 species, three are epiphytes and rest are terrestrial forms.

1599. **Singh, V. & Srivastava, S.K. 2015.** "Note on occurrence and copious growth of medicinal fern *Helminthostachys zeylanica* (L.) Hook. (Ophioglossaceae) in Tikri forest, Gonda, Uttar Pradesh". *Phytotaxonomy* 15: 204–205.

Abstract: The present communication deals with the note on conservation status and occurrence of an ethnomedicinal fern *Helminthostachys zeylanica* (L.) Hook. (Ophioglossaceae) in Tikri forest, Gonda, Uttar Pradesh.

1600. **Sinha, A.B., Singh, U.S. & Shukla, M.S. 1990.** "Genus *Riccia* (Mich.) L. of district Gorakhpur". *J. Econ. Taxon. Bot.* 14(1): 201–203.

Abstract: A total of 12 species of *Riccia* have been collected and identified from different localities of district Gorakhpur. Out of which *R. perssonii* and *R. fluitans* are unique and of very rare occurrence. *R. perssonii* is characterised by its isobilateral spore tetrads in which all the four spores remained permanently adhered with each other even up to the stage of spore germination. They were collected exclusively from the swampy margins of 'Turra nala' near Tilkonia forest range.

1601. **Srivastava, B., Dwivedi, A.K. & Pandey, V.N. 2011.** "Morphological characterization and yield potential of *Termitomyces* spp. mushroom in Gorakhpur foest Division". *Bull. Environm. Pharmacol. & Life Sci.* 1(1): 54–56.

Abstract: *Termitomyces* is a wild mushroom growing in the symbiotic association of termite under or aboveground the termatorium, which is extensively used as human food and medicine from the time immortal. It has many more species throughout the country, but the study reveals in the Gorakhpur forest division confined that there are four species of *Termitomyces* are found. In order to determine the genetic diversity among these four species were studied by using morphological characterization, phenotypical appearance. Four species naming *Termitomyces heimii, Termitomyces clypeatus, Termitomyces mammiformis* and *Termitomyces microcarpus* characterized by different morphological traits i.e., shape of perforatorium, stipe length(cm), pileus length, margin of fruit body, colour of fruit body, gills, flesh, annulus, pseudorrhiza and spore print were recorded. Results indicate that all the four species of *Termitomyces* shows great diversity in their morphological characters.

1602. **Srivastava, M. 2002.** "Enumeration of pteridophytes of Allahabad district (Uttar Pradesh)". *J. Econ. Taxon. Bot.* 26(1): 176–180.

Abstract: The paper enumerates the pteridophytic flora of Allahabad district. Extensive collections made over the years and review of literature reveals that 21 species of pteridophytes belonging to 12 genera in 12 families occur in the district. Ophioglossaceae is the largest fern family in Allahabad having six species belonging to genus *Ophioglossum* Linn.

1603. **Srivastava, M., Khare, P.B. & Chandra, S. 2002.** "Additions to the pteridophytic flora of the Corbett National Park". *Indian Fern J.* 19: 107–110.

Abstract: Survey and assessment of ferns and fern allies of Corbett National Park, Uttaranchal have been undertaken. In the course of the examination of material collected from the Corbett National Park and comparison with earlier reports it has been found that 11 taxa are new records of occurrence for the first time from this area, as they have not been recorded earlier.

1604. **Srivastava, R.C. 1985.** "Mycoflora of Jaunpur district (Uttar Pradesh)– A check list". *J. Econ. Taxon. Bot.* 6(3): 655–662.

Abstract: Fungi belonging to 70 genera and 174 species collected from different localities of district Jaunpur have been listed. A mention of their hosts or substrates and the symptoms produced by them on their host has also been made.

1605. **Srivastava, S.C. & Rawat, K.K. 2011.** "On an endangered liverwort (Marchantiophyta) from India: Proposal for Red listing". *Nelumbo* 53: 201–204.

Abstract: An extremely rare liverworts (Hepaticae) viz., *Southbya gollanii* Steph. Is described from Nag Tibba, Mussoorie, India and assessed for its status according to the guidelines of IUCN for bryophytes.

1606. **Srivastava, S.K., Rajkumar, S.D. & Singh, S.K. 2014.** "*Pteris biaurita* L. (Pteridaceae)– An addition to the fern flora of Uttar Pradesh, India". *J. Bombay Nat. Hist. Soc.* 111(2): 154–156.

Abstract: *Pteris biaurita* L. (Pteridaceae) has been reported for the first time to the fern flora of Uttar Pradesh from Dushwa National Park-Lakhimpur Kheri.

1607. **Srivastava, S.L. & Singh, J. 1984.** "An addition to the fungi of India". *Geobios, New Rep.* 3: 64.

Abstract: An Ascomycetes viz., *Gelasinospora longispora* Udagawa) has been reported for the first time for India from fern leaf litter at Srinagar (Garhwal Himalayas).

1608. **Suseela, M.R. & Dwivedi, S. 2001.** "A contribution to freshwater algal flora of Bundelkhand region of Uttar Pradesh (Chlorophyceae & Xanthophyceae)". *Phytotaxonomy* 1: 76–81.

Abstract: The present paper deals with the freshwater algal flora of Mahoba district which lies in Bundelkhand region of Uttar Pradesh. Despite the presence of many water bodies in and around this region there were no reports on the algal flora of this region. A total number of 41 Chlorophyceae and 2 Xanthophyceae forms were recorded in this report.

1609. **Suseela, M.R. & Dwivedi, S. 2002.** "A contribution to freshwater algal flora (Bacillariophyceae) of Bundelkhand region of Uttar Pradesh". *Phytotaxonomy* 2: 33–39.

Abstract: This paper deals with the freshwater algal flora (mainly Diatoms) of Mahoba district in Bundelkhand region of Uttar Pradesh. A total of 26 species of 14 genera of Bacillariophyceae (Diatoms) have been recorded here for the first time from Bundelkhand region of Uttar Pradesh.

1610. **Suseela, M.R. & Toppo, K. 2010.** "Algal flora of Katarniya Ghat Wildlife sanctuary, district Bahraich in Uttar Pradesh, India". *Indian J. Forest.* 33(2): 217–220.

Abstract: The present communication enumerates 24 algal taxa out of which four belongs to Cyanophyceae and nineteen Chlorophyceae. The area was surveyed for the first time and all taxa have been reported for the first time from Katarniya Ghat Wildlife sanctuary.

1611. **Tewari, L.M., Kumar, S. & Upreti, K. 2010.** Assessment of Gymnosperm diversity of Uttarakhand. In: Tewari, L.M., Pangtey, Y.P.S. & Tewari, G (Eds.), *Biodiversity Potential of the Himalaya.* Gyanodaya Prakashan, Nainital. Pp. 265–278.

1612. **Tewari, R.B. 1973.** "Pteridophytic flora of Lucknow district (U.P.)". *Bull. Bot. Surv. India* 15(1&2): 129–130.

Abstract: Eighteen species of pteridophytes belonging to 11 different families has been recorded from Lucknow district of Uttar Pradesh.

1613. **Tewari, S.C. 1979.** *Studies on Phytosociology, Plant Biomass and Net Primary Productivity off our grassland Communities of Pauri Hills, Garhwal.* Ph.D. Thesis, H.N.B. Garhwal University, Srinagar. (unpublished).

1614. **Tripathi, A.K. & Pandey, S.N. 1985.** "Algal pollutants of Unnano ponds. III. Euglenineae". *J. Econ. Taxon. Bot.* 7(3): 581–584.

Abstract: The present work deals with the description of Euglenineae from different ponds and puddles of district Unnao (U.P.). Fourteen Euglenoids have been described including four genera. *Euglena* (5), *Lepocinclis* (1), *Phacus* (5) and *Trachelomonas* (3).

1615. **Tripathi, A.K. & Pandey, S.N. 1988a.** "Algal pollutants of Unnano ponds. V. Systematic enumeration of Blue-green". *J. Econ. Taxon. Bot.* 12(2): 285–292.

Abstract: The present paper deals with the systematic enumeration of blue-greens from different ponds, crop fields and moist places of district Unnao, U.P., Sixty three species have been described belonging to nineteen genera including eleven species of six genera from Chroococcales and 52 species of thirteen genera from Nostocales.

1616. **Tripathi, A.K. & Pandey, S.N. 1988b.** "Algal pollutants of Unnano ponds. VII. Desmidiaceae". *J. Econ. Taxon. Bot.* 12(2): 361–362.

Abstract: Present paper deals with a taxonomic enumeration of 23 desmids which have been collected from the waters of Unnao city (U.P., India) and its environs. In the present investigation it was found that the species of *Cosmarium* are dominant having 10 taxa.

1617. **Tripathi, A.K. & Pandey, S.N. 1990.** "Studies in algae of polluted ponds of Kanpur (India)– Systematic enumeration of Euglenoids". *J. Econ. Taxon. Bot.* 14(1): 217–220.

Abstract: Eighteen taxa of Euglenoids belonging to 4 genera are described with illustrations collected from polluted ponds of Kanpur during March 1983 to February 1984.

1618. **Tripathi, A.K. & Pandey, S.N. 1991.** "Studies on algae of polluted ponds of Kanpur (India)– XIII. Systematic enumeration of Cyanophyceae". *J. Econ. Taxon. Bot.* 15(2): 409–421.

Abstract: The present paper deals with systematic enumeration of blue green algae (Cyanophyceae) collected from Chandari pond and Kalyanpur pond of Kanpur during March 1983 to Fenruary, 1984. In all, 51 taxa belonging to 12 genera have been described. A taxonomic enumeration alongwith camera lucida diagrams and periodical occurrence have been presented.

1619. **Tripathi, A.K., Pandey, S.N. & Kumar, A. 1985.** "*Strombomonas fluviatilis* (Lemm.) Defl. (Euglenaceae)– A new record for India". *J. Econ. Taxon. Bot.* 6(2): 454.

Abstract: *Strombomonas fluviatilis* (Lemm.) Defl. was been reorded for the first time for Northen India from Kanpur city, which is so far reported in southern India from Kerala.

1620. **Tripathi, A.K., Pandey, S.N. & Sinha, B.K. 1987.** "Algal pollutants of Unnao ponds IV. Chlorococcales". *J. Econ. Taxon. Bot.* 9(1): 239–242.

Abstract: The present paper reports 28 taxa of Chlorococcales belonging to 13 genera from district Unnao, U.P. In the present investigation it was found that the species of *Scenedesmus* are dominant having 12 taxa.

1621. **Tripathi, P., Tewari, L.M., Tewari, A., Kumar, S., Pangtey, Y.P.S. & Tewari, G. 2009.** "Gymnosperms of Nainital". *Report* & *Opinion* 1(3): 82–104.

Abstract: The Gymnosperms (gymno=naked; sperma=seeds; the terminology coined by Theophrastus) are a group of vascular plants whose seeds are not enclosed by a

ripened ovary (fruit). In 1825 the Scottish botanist Robert Brown distinguished gymnosperms from the other major group of seed plants, the angiosperms, whose seeds are surrounded by an ovary wall. In the present study, 8 families of gymnosperms were identified which includes 15 species belonging to 14 genera. *Pinus* is represented by two species: *Pinus roxburghii* Roxb. and *Pinus wallichiana* A. B. Jackson. *Cedrus deodara* Roxb., *Cupressus torulosa* D. Don and *Pinus roxburghii* Roxb. occurs in wild state while all others are grown as ornamental plants.

1622. **Trivedi, B.S., Malhotra, B.N., Aswal, B.S. & Chandra, P. 1983.** "Pteridophytic flora of Mandakini valley in Garhwal Himalaya". *J. Indian Bot. Soc.* 62: 90–96.

Abstract: The present report is based on the field collection made by one of the author during the year 1972-1977 while working the flora of the Mandakini valley in the Western part of the Chamoli district, Uttar Pradesh. Supplementing the earlier work, 60 species of ferns and fern allies representing 35 genera, belonging to 11 families have been additionally enumerated.

1623. **Uniyal, K. 2001.** "Two new species of pathogenic fungi in *Juglans regia* Linn. from India". *Indian J. Forest.* 24(1): 97–98.

Abstract: Two new species of pathogenic fungi viz., *Cercospora juglandis* and *Mycosphaerella juglans* in *Juglans regia* Linn. leaf has been reported first time from Dehra Dun, Uttaranchal, India.

1624. **Uniyal, S.K. & Awasthi, A. 2000.** "Gymnosperms of Uttar Pradesh: An Enumeration". *Indian J. Forest.* 23(2): 228–231.

Abstract: The paper enumerates species of gymnosperms found in Uttar Pradesh. Of the total 40 species found in U.P., 18 are wild whereas 22 species are introduced.

1625. **Upreti, D.K. & Chatterjee, S. 1999.** "Epiphytic lichens on *Quercus* and *Pinus* trees in the three forest stands in Pithoragarh district, Kumaun Himalayas, India". *Trop. Ecol.* 40(1): 41–49.

1626. **Upreti, D.K. & Chatterjee, S. 2000.** "Distribution of lichens on *Quercus* and *Pinus* trees in Almora district, Kumaun Himalayas". *Geophytology* 28(1-2): 41–49.

1627. **Upreti, D.K. & Chatterjee, S. 2002.** "Lichen genus *Aspicilia* Massal. (Lecanorales) in India". *Phytotaxonomy* 2: 1–10.

Abstract: The paper deals with 10 species of lichen genus *Aspicilia*, *A. almorensis* Rasanen, *A. alphoplaca* (Wahlenb) Poelt & Leukert, *A. caesiocinerea* (Nyl. ex Malbr.) Arnold, *A. calcarea* (L.) Summerf, *A. cinerea* (L.) Koerber, *A. dwaliensis* Rasanen, *A. griseocinerea* Rasanen, *A. maculata* (H. Magn.) Awasthi and *A. praeradiosa* (Nyl.) Poelt & Leuck. known from India.

1628. **Upreti, D.K. & Divakar, P.K. 2003.** "Distribution of lichens in Corbett Tiger Reserve, Uttaranchal". *J. Econ. Taxon. Bot.* 27(Suppl.): 1043–1060.

Abstract: The paper enumerates 108 species representing 35 genera of lichens found growing on twelve major tree species and other substrates in thirteen forest sites of Corbett Tiger Reserve, Uttaranchal, India. It also includes a comparative account of lichens growing on different phorophytes. The *Syzygium cumini* trees bear the maximum number of lichen species, represented by 64 species, followed by *Shorea robusta, Mallotus philippensis, Murraya koenigii* and *Mangifera indica* by 27, 21, 8 and 7 species respectively. Among the various localities of the Reserve, the Dugadda area has maximum diversity of 29 lichen species, followed by Chuhi, Sultan and Sandikhal by 19, 18 and 15 species respectively. *Cryptothecia lunulata* (Zahlbr.) Makh. & Patw., is the most common lichen of the reserve, grows almost on all the trees. There is a dominance of crustose lichens, represented by 89 species while only 21 foliose lichens are known from the reserve.

1629. **Upreti, D.K. & Negi, H.R. 1995.** "Licehns of Nanda Devi Biosphere Reserve, Uttar Pradesh, India– I". *J. Econ. Taxon. Bot.* 19(3): 627–636.

Abstract: This paper enumerates 87 species of 33 genera of lichens found growing on trees, shrubs, dead wood, rocks, humus, moss beds and soil in different vegetational types of Nanda Devi Biosphere Reserve, Uttar Pradesh, India.

1630. **Upreti, D.K. & Negi, H.R. 1998.** "Licehn flora of Chopta-Tunganath, Garhwal Himalayas, India". *J. Econ. Taxon. Bot.* 22(2): 273–286.

Abstract: The paper enumerates 92 species of lichens from Chopta-Tunganath hills. Luxuriant growth of both microlichens and macrolichens genera indicates that the Chopta-Tunganath area, being a developing tourist place in Garhwal Himalayas is still not badly influenced by the human activities. The present number of lichens of the area will be baseline record for carrying out various environmental studies in future, as these plants are the best indicators of air pollution and local microclimatic change.

1631. **Upreti, D.K., Nayaka, S. & Chatterjee, S. 2010.** Lichen diversity of Uttarakhand Himalaya. In: Uniyal, P.L., Chamola, B.P. & Semwal, D.P. (Eds.), *The Plant Wealth of Uttarakhand.* Jagdamba Publishing Co., New Delhi, Pp. 79–195.

1632. **Upreti, D.K., Pant, V. & Divakar, P.K. 2001.** "Distribution of lichens in Askot-Sandev Botanical Hotspots of Pithoragarh district, Uttar Pradesh". *Phytotaxonomy* 1: 40–45.

Abstract: The paper enumerates the distribution of 52 lichen species found growing on different tree species in seven forest sites of Askot-Sandev Botanical Hot spot of Pithoragarh district, Uttar Pradesh. A comparative account of lichens in disturbed and undisturbed sites of Hot spot is also provided.

1633. **Upreti, D.K., Pant, V. & Divakar, P.K. 2002.** "Exploitation of lichens from Pithoragarh district, Uttaranchal". *Ethnobotany* 14: 60–62.

Abstract: Sixteen species of lichens from Askot-Sandev area of Pithoragarh district, Uttaranchal exhaustively exploited for trade have been enumerated.

1634. **Verma, B.L. & Khulbe, R.D. 1987.** "An addition to Indian mycoflora". *Geobios, New Rep.* 6: 53–54.

Abstract: *Pythium hypogynum* Middleton has been reported for the first tiem for Indian mycoflora from agricultural fields of Tarai, Nainital.

1635. **Verma, R.K. & Pandro, V. 2018.** "Diversity and distribution of Amanitaceous mushrooms in India, two new reports from Sal forest of Central India". *Indian J. Trop. Biodiv.* 26(1): 42–54.

Abstract: An account of mushrooms belonging to Amanitaceae reported from different part of India is given. Total 80 species of Amanitaceae, including 73 species of *Amanita*, 1 of *Catatrama*, 4 of *Limacella* and 2 of *Saproamanita* were compiled from literature with their records of habitat, distribution and references. Uttarakhand represent the maximum diversity of Amanitaceae and reported species from 27 places followed by Himachal Pradesh (24), Kerala (16), Odisha (7), Jammu and Kashmir and Meghalaya (5 each), Madhya Pradesh (4) West Bengal (3) and rest of states showed only two, one or no place of occurrence of any species. Two species of *Amanita* namely: *Amanita bisporigera* and *Amanita pantherina* were recorded for the first time from Sal forest of Central India (Madhya Pradesh). These fungi are known to form ectomycorrizal association with sal trees. One species, *Amanita populiphila* was earlier reported as growth promoter of forest tree saplings, tea and *Gmelina*.

1636. **Verma, S.C. & Khullar, S.P. 1980.** "Ferns of Nainital (W. Himalaya)- An updated list". *Fern Gaz.* 12: 83–92.

1637. **Vishwakarma, M.P., Bhatt, R.P. & Gairola, S. 2011.** "Some medicinal mushrooms of Garhwal Himalaya, Uttarakhand, India". *Int. J. Med. Aromat. Pl.* 1(1): 33–40.

Abstract: Garhwal Himalaya is glorified by the rich diversity of mushrooms. There is vast scope of study on the medicinal mushrooms growing in this region. The wild mushrooms have been used as medicine since time immemorial. They are considered and known to be a rich source of proteins and vitamins. In the present paper details of some medicinally important mushrooms collected from the Garhwal region is being given, whose medicinal uses are recorded from India and elsewhere in the world. Medicinally important mushrooms of the Garhwal Himalaya discussed in the present paper are *Ganoderma lucidum, Agaricus campestris, Hydnum repandum, Coprinus comatus, Morchella esculenta* and *Cantharellus cibarius*.

1638. **Vishwakarma, P., Singh, P. & Tripathi, N.N. 2016.** "Nutritional and antioxidant properties of wild edible macrofungi from North-Eastern Uttar Pradesh, India". *Indian J. Tradit. Knowl.* 15(1): 143–148.

Abstract: Eastern part of Uttar Pradesh, India is home to diverse form of macrofungi some of which are excellently edible and commonly used by local peoples as food and medicine. The nutritional composition and antioxidant activity of four wild edible macrofungi, viz. *Calocybe gambosa, Calocybe indica, Macrolepiota procera* and *Tuber aestivum* collected from different areas of Gorakhpur were evaluated. The total phenol content of each species along with some bioactive compounds was analysed. The nutrient composition of these macrofungi showed that they are rich source of protein and carbohydrate. Protein, carbohydrate, lipid, fibre, moisture and ash ranged from 31.40-49.05%, 41.25-65.00%, 0.27-1.08%, 6.41-17.97%, 54.75-76.97%, 2.64-10.34%, respectively on dry weight basis. Total phenol contents (major antioxidants components) ranged from 23.89-38.37GAEmg/gm in different macrofungi. Current study confirms that macrofungi are healthy source of food and medicine can also be use as alternative source of protein in human diet.

1639. **Vohra, J.N. 1966.** "Some new record of mosses from Western Himalayas". *Bull. Bot. Surv. India* 8: 346–348.

Abstract: Three species viz., *Barbula asperifolia* Mitt. (Pottiaceae), *Anomobryum auratum* (Mitt.) Jaeg. (Bryaceae) and *Aerobryidium filamentosum* (Hook.) Fleisch. (Meteoriaceae) were found to be new record for Western Himalayas from Jammu

(Seoj, Bhadrawa dist.), Mussoorie (Lal Tibba) and Chakrata (Dehra Dun dist.), respectively.

1640. **Vohra, J.N. 1968.** "New records of mosses from Western Himalayas". *Bull. Bot. Surv. India* 10(3&4): 394–396.

Abstract: *Leucobryum aduncum* Doz. et Molk. and *Platyhypnidium muelleri* (Jaeg.) Fleisch. are so far reported only from South India reported here for the first time from western Himalaya from Pithoragarh district (Kumaon) and Tangmarg (Kashmir). *Splachnobryum indicum* Hamp. et C. Muell. is known only from Bengal and *Plagiothecium denticulatum* (Hedw.) B.S.G. only from Sikkim are reported here from Tehri district (Uttar Pradesh and Tangmarg (Kashmir) for Western Himalaya.

1641. **Vohra, J.N. 1970.** "A contribution to the moss flora of Western Himalaya– II". *Bull. Bot. Surv. India* 12(1-4): 97–103.

Abstract: Fifty five species of mosses collected from Western Himalaya are enumerated, with notes on distribution etc. This includes one new species *Campylium gollanii* C. Muell. ex Vohra, which is described and illustrated from Jamna-Chetty (Tehri Garhwal), one new record for India, namely *Polytrichum juniperinum* Willd. ex Hedw. subsp. *strictum* (Brid.) Nyl. et Sael from Tapoban (Garhwal) and 8 species new to Western Himalaya viz., *Campylopus ericoides* (Griff.) Jaeg. & *Dicranum gymnostomum* Mitt. from Mandakini valley (Garhwal), *Oxystegus stenophyllus* (Mitt.) Gangulee from Dehra Dun, *Rhodobryum giganteum* (Schwaegr.) Par. from Hanuman-Chetty (Tehri Garhwal), *Fleischerobryum longicolle* (Hamp.) Loesk. from Shiana-Chetty (Tehri Garhwal), *Macromitrium sulcatum* (Hook. brid.) from Didighat (Kumaon), *Thuidium meyenianum* (Hamp.) Doz. et Molk. from Dehra Dun and *Stereophyllum indicum* (Bel.) Mitt. from Rishikesh. One species *Hydrogonium consanguineum* (Thwait et Mitt.) Hilp. from Varanasi, new to North India.

1642. **Vohra, J.N. 1974.** "*Plagiothecium dehradunense* Vohra– A new species of moss from Dehra Dun (U.P.), India". *Bull. Bot. Surv. India* 16(1-4): 139–141.

Abstract: A new species of moss, viz. *Plagiothecium dehradunense* Vohra allied to *P. curvifolium* Schlieph. has been described and illustrated from Dehra Dun.

1643. **Vohra, J.N. 1980.** "New taxa of Hypnobryales (Musci) from the Himalaya". *Bull. Bot. Surv. India* 22(1-4): 115–125.

Abstract: Six new species, viz., *Hygroamblystegium gangulianum* allied to *H. tenax* (Hedw.) Jenn. from Mussooie Landour, *Hygrohypnum nairii* alled to *H. luridum* (Hedw.) Jenn. from Kalamuni, Pithoragarh, *Hygrohypnum choprae* allied to *H. ochraceum* (Turn.) Loesk. from Darjeeling, *Brachythecium chakratense* allied to *B. salebrosum* (Web. et Mohr.) B.S.G. from Churani to Chakrata, Garhwal, *Brachythecium garhwalense* allied to *B. kumounense* (Harv.) Jaeg. from Deoban, Jaunsar Bahar and *Rhynchostegium calderii* allied to *R. celibicum* (Lac.) Jaeg. from Lalkuti, 2-3 miles on Sonada-Mongpu road has been described and illustrated. Three new varieties, viz., *Pseudoleskea laevifolia* (Mitt.) Jaeg. var. *vasudharensis* allied to *P. laevifolia* var. *laevifolia* from Vasudhara, Chamoli district, *Thuidium contortulum* (Mitt.) Jaeg. var. *mussooriense* allied to *T. contortulum* (Mitt.) Jaeg. var. *contortulum* from Mussoorie and *Thuidium* *squarrosulum* (Mitt.) Jaeg. var. *scabrisetum* allied to *T. squarrosulum* (Mitt.) Jaeg. var. *squarrosulum* from Lumichawa, Bhutan has been described and illustrated.

1644. **Vohra, J.N. & Wadhwa, B.M. 1964.** "Mosses collected during Nilkanth and Chaukhamba Expedition–1959". *Bull. Bot. Surv. India* 6(1): 43–46.

Abstract: The mosses collected during I.A.F. Expedition to Nilkanth and Chaukhamba peaks in the year 1959 are listed with brief field notes. These comprise 60 species covering 13 families and 35 genera and include 2 new records for India and 3 for Western Himalayas.

New Discovery, New Reports, Rediscovery, Revision and Monograph

1645. **Adhikari, B.S. 2008.** "*Chusua nana*: An orchid, new record for Nanda Devi National Park (Nanda Devi Biosphere Reserve), Uttarakhand, India". *J. American Sci.* 4(4): 27–31.

Abstract: Nanda Devi National Park (NDNP) is one of the "World Heritage Site" covering an area 624.6 km^2 and forms one of the core zones of Nanda Devi Biosphere Reserve, which was established in 1988 under the MAB programme of UNESCO. Nanda Devi NP was unexplored and naturally protected by high mountains and glaciers until the scaling of Nanda Devi peak in 1934. *Chusua nana* (King & Pantl.) Pradhan has been recorded for the first time for Chamoli district of Garhwal Himalaya from Chuli and Betartoli in Nanda Devi National Park.

1646. **Agnihotri, P., Sharma, S., Dixit, V., Singh, H. & Hussain, T. 2010.** "Newly reported sacred groves from Kumaon Himalaya". *Curr. Sci.* 99: 996–997.

1647. **Agrawal, A.K., Gupta, S.K. & Joshi, A.P. 1984.** "Addition of some grasses to the flora of Pauri Garhwal district, U.P.". *J. Econ. Taxon. Bot.* 5: 747–749.

Abstract: *Alloteropsis cimicina* (L.) Stapf, *Coix lacryma-jobi* L., *Hemarthria longifolia* (Hook.f.) A. Camus, *H. compressa* (Linn.f.) R. Br., *Ischaemum rugosum* Salisb., *Setaria palmifolia* (Koenig) Stapf and *Setaria homonyma* (Steud.) Choiv. have been reported for the first time for the flora of Pauri Garhwal.

1648. **Agrawal, A.K., Gupta, S.K. & Negi, K.S. 1984.** "*Chrysopogon zeylanicus* (Nees) Thw.– A new record from North Western Himalaya". *J. Econ. Taxon. Bot.* 5(1): 244.

Abstract: *Chrysopogon zeylanicus* (Nees) Thw. has been recorded for the first time for North Western Himalaya from Dwarikhal forest of Pauri district, Garhwal. Earlier this species has been reported from Tamilnadu.

1649. **Agrawal, S. & Bhattacharyya, U.C. 1979.** "*Sebaea khasiana* C.B. Clarke (Gentianaceae)– A rare find from N.W. Himalaya". *Bull. Bot. Surv. India* 21(1-4): 234–235.

Abstract: Rao & Hajra (1973) reported *Sebaea khasiana* C.B. Clarke in Kameng district of Arunachal Pradesh. Clarke (1883) included this species from Garhwal (N.W.

Himalaya) on the basis of Edgeworth' collection which is now available in Kew Herbarium. In this present paper authors reported this species from Almora district, Kumaon with a photo is intended to prove its presence in the N.W. Himalaya, emphasize its rarity and facilitate record of this species in Indian Herbarium.

1650. **Agrawal, S. & Bhattacharyya, U.C. 1980.** "A note on *Gentianella gentianoides* (Franchet) H. Smith (Gentianaceae)". *Bull. Bot. Surv. India* 22(1-4): 187–188.

Abstract: *Gentianella gentianoides* (Franchet) H. Smith hitherto known from Iran, Pakistan and China, the present discovery is the first report of this species in India from Damifitia Gadh (Garhwal) and Almora (Kumaon) extending the range of distribution to India.

1651. **Agrawal, S. & Bhattacharyya, U.C. 1984.** "*Gentiana argentea* var. *albescens* Franch. ex Forbes & Hemsley– A new record for India". *Bull. Bot. Surv. India* 26: 100–101.

Abstract: A new variety of *Gentiana argentea* viz., *G. argentea var. albescens* Franch. ex Forbes et Hemsley has been recorded for the first time for India from Himachal Pradesh (Lahul, Spiti, Kinnaur) and Uttar Pradesh (Chamoli, Tehri). Previously the distribution of the taxon was known from China, Tibet & Afghanistan.

1652. **Agrawala, D.K. & Chowdhery, H.J. 2008a.** "*Eulophia epidendraea* (J. Koenig ex Retz.) C.E.C. Fisch.– An addition to the orchid flora of Himalayan region". *Indian J. Forest.* 31(4): 629–632.

Abstract: *Eulophia epidendraea* (J. Konig ex Retz.) C.E.C. Fisch. (Orchidaceae), so far known in India from peninsular regions is being reported for the first time from the Himalayan region. The same is described and illustrated here.

1653. **Agrawala, D.K. & Chowdhery, H.J. 2008b.** "*Eria bipunctata* Lindl. (Orchidaceae)– First report of its occurrence in Sikkim and North-West Himalaya". *J. Orchid Soc. India* 22(1-2): 69–71.

Abstract: *Eria bipunctata* Lindl. (Orchidaceae) being reported for the first time from Sikkim and North-West Himalaya, is described and illustrated here.

1654. **Agrawala, D.K. & Chowdhery, H.J. 2009.** "*Eria globulifera* Seidenf.– Addition to the orchid flora of Sikkim and North-west Himalaya". *Indian J. Forest.* 32(1): 103–106.

Abstract: *Eria globulifera* Seidenf. (Orchidaceae), known from Arunachal Pradesh and Manipur in India, is reported for the first time from Mangan-Singhik, Sikkim and Thal-Didihat, Pithoragarh district, Uttarakhand, North-West Himala. The same is described and illustrated here.

1655. **Agrawala, D.K., Chowdhery, H.J. & Bhattacharjee, A. 2009.** "*Goodyera biflora* (Lindl.) Hook.f. – An interesting Jewel Orchid from Kumaun Himalaya, Uttarakhand". *J. Non-Timber Forest Prod.* 16(2): 155–157.

Abstract: *Goodyera biflora* (Lindl.) Hook.f. (Orchidaceae) - a beautiful and rare orchid belonging to the 'Jewel Orchid' group is collected from Pithoragarh district of Uttarakhand. Its distributional significance is discussed with a brief description and illustration with information on its phenology, habitat and conservation status.

1656. **Ambrish, K. & Srivastava, S.K. 2015.** "New plant records of family Fabaceae for Uttarakhand". *Indian J. Forest.* 38(2): 151–152.

Abstract: Four taxa of family Fabaceae viz. *Eriosema chinense* Vogel, *Indigofera exilis* Grierson & Long, *Desmodium continuum* var. *retusum* (D. Don) Ohashi and *Crotalaria medicaginea* Lam. var. *herniarioides* (Wight & Arn.) Baker, are being reported for the first time from Uttarakhand.

1657. **Ambrish, K. & Srivastava, S.K. 2016.** "*Girardinia diversifolia* (Link) Friis subsp. *suborbiculata* (C.J. Chen) C.J. Chen & Friis (Urticaceae): A new record for India". *Indian J. Forest.* 39(2): 151–153.

Abstract: *Girardinia diversifolia* (Link) Friis subsp. *suborbiculata* (C.J. Chen) C.J. Chen & Friis, so far known from China and South Korea is reported for the first time from Garhwal region, Uttarakhand, as a new record to Indian flora.

1658. **Ansari, A.A. 1985.** "*Cnidium monnieri* (L.) Cusson– Notes on its occurrence in India". *J. Econ. Taxon. Bot.* 6(2): 407–409.

Abstract: Additional locality for *Cnidium monnieri* (L.) Cusson (Apiaceae) has been reported from Madhulia forest of Gorakhpur, Uttar Pradesh along with notes on its occurrence in India.

1659. **Ansari, A.A. 1990.** "Extended distribution of an endemic monotypic genus *Wagatea* Dalz.". *J. Econ. Taxon. Bot.* 14(3): 746–747.

Abstract: *Wagatea* Dalz., a monotypic genus of the family Caesalpiniaceae represented by *W. spicata* Dalz., hitherto regarded as endemic to Peninsular India, Maharashtra and Karnataka is hereby reported from Madhulia forest, Gorakhpur (U.P.) alongwith notes on its occurrence in India.

1660. **Ansari, A.A. & Chandra, V. 1992.** "Additions to the flora of Gorakhpur". *J. Econ. Taxon. Bot.* 16(1): 155–160.

Abstract: The present paper enumerates 99 species of angiosperms belonging to 44 families not so far reported from Gorakhpur. These have been collected from madhulia forest. The species have been arranged alphabetically for the sake of convenience.

1661. **Ansari, A.A. & Nand, Ghana. 1986.** "*Cymbidium macrorhizon* Lindl.– A rare orchid from Pauri Garhwal". *Indian J. Forest.* 9(4): 358.

Abstract: In the present paper, the only terrestrial leafless *Cymbidium* viz., *C. macrorhizon* Lindl. has been reported from Nagdev region, Pauri Garhwal growing saprophytically under *Cedrus deodara*. This curious taxon has been reported earlier from Garhwal (Mussoorie & tehri) and Kumaun regions of Uttar Pradesh. The present report of its occurrence in Pauri Garhwal, besides an additional distributional record, will be helpful in collecting the species for horticultural studies.

1662. **Ansari, A.A. & Nand, Ghana. 1987.** "Little known economic plants of Pauri Garhwal". *Indian J. Forest.* 10(4): 316–317.

Abstract: Thirteen plants belonging to 10 families of economic importance other than medicinal ones has been reported from Pauri Garhwal.

1663. **Arora, C.M. 1969a.** "New records of some orchids from Western Himalaya". *Bull. Bot. Surv. India* 11(1&2): 202–204.

Abstract: *Bulbophyllum densiflorum* Rolfe, *Cirrhopetalum cornutum* Lindl. and *Oberonia myriantha* Lindl. have been collected which appear to be new records for Western Himalaya from Pithoragarh district in eastern Kumaon.

1664. **Arora, C.M. 1969b.** "New records of some orchids from Western Himalaya– II". *Bull. Bot. Surv. India* 11(3&4): 430.

Abstract: *Eria excavate* Lindl. ex Hook.f. and *Otochilus porrecta* Lindl. have been collected which appear to be new records for Western Himalaya from Didighat/ Shandev in Pithoragarh district of eastern Kumaon.

1165. **Arora, C.M. 1969c.** "New records of some orchids from Western Himalaya– III.". *Bull. Bot. Surv. India* 11(3&4): 437–438.

Abstract: *Cirrhopetalum guttulatum* Hook.f., *Liaris ridleyi* Hook.f. and *Pholidota griffithii* Hook.f. have been collected which appear to be new records for Western Himalaya from Didighat, Pithoragarh district in eastern Kumaon.

1666. **Arora, C.M. 1969d.** "A new species of *Bulbophyllum* Thou. (Orchidaceae) from Eastern Kumaon". *Bull. Bot. Surv. India* 11(3&4): 440–441.

Abstract: A new species of *Bulbophyllum* Thou. viz., *B. raui* allied to *B. reptans* Lindl. has been described and illustrated from Shandev on Shandev-Thal road, Pithoragarh district, Eastern Kumaon.

1667. **Arora, C.M. 1972a.** "*Habenaria dentata* (Sw.) Schltr., a new record for India from western Himalaya". *Bull. Bot. Surv. India* 14(1-4): 155–156.

Abstract: *Habenaria dentata* (Sw.) Schltr., a terrestrial orchid is being recorded for the first time for India from Kumaon Himalaya at Bageshwar and Thal, Almora district.

1668. **Arora, C.M. 1972b.** "New records of some orchids from Western Himalaya– IV". *Bull. Bot. Surv. India* 14(1-4): 173–175.

Abstract: Four species of orchid, viz., *Bulbophyllum wallchii* Rechb.f., *Cryptochilus lutea* Lindl., *Oberonia auriculata* King & Pantl. and *O. myosurus* Lindl. hitherto known from Sikkim, Bhutan, Manipur and Nepal are now recorded from Pithoragarh district of Eastern Kumaon, in the Western Himalaya.

1669. **Arora, C.M. 1978.** "New records of some orchids from North-West Himalaya– V". *Indian J. Forest.* 1(4): 297–298.

Abstract: In the present paper 10 species of orchid has been recorded as new from Pithoragarh district in North-West Himalaya. These orchids are seen perched at various heights and exposure on moss covered main trunks and branches of trees.

1670. **Arora, C.M. 1980.** "New records of some orchids from N.W. Himalaya– VI". *Indian J. Forest.* 3(1): 78–79.

Abstract: Four orchids viz., *Cymbiium hookerianum* Reichb.f., *Dendrobium macraei* Lindl., *Oberonia wightiana* Lindl. and *Pholidota recurva* Lindl. has been reported first time from North West Himalaya from Dafia Dhoora and Kaflani reserve forest in Pithoragarh distrct of Kumaon.

1671. **Arora, C.M. & Malhotra, C.L. 1979.** "*Gymnadenia camtschatica* (Cham.) Miyabe & Kudo (Orchidaceae)– A new record for India". *Indian J. Forest.* 2(4): 311–312.

Abstract: *Gymnadenia camtschatica* (Cham.) Miyabe & Kudo has been recorded for the first time for Indian flora from Pithoragarh district of E. Kumaon.

1672. **Arora, C.M. & Prasad, R. 1980.** "New or little known plants from Kumaon Himalaya– II". *Indian J. Forest.* 3(4): 372–373.

Abstract: In the present paper 23 species belonging to 13 families are enumerated which are not reported earlier from Kumaun Himalaya.

1673. **Aswal, B.S. (1972) 1975.** "A note *Urtica urens* Linn. (Urticaceae)". *Bull. Bot. Surv. India* 14: 169–170.

Abstract: *Urtica urens* L. (Urticaceae), generally known as 'Small Nettle' has been recorded for the first time for the Indian flora from Bhandari Bagh, Dehra Dun. It is distributed in the temperate and subtemperate zone in Europe, California, Soviet Russia, Tropical Africa and British Isles.

1674. **Aswal, B.S. 1997.** "A note on the occurrence of *Urtica urens* Linn. (Urticaceae) in Tehri Garhwal, U.P., India". *Indian J. Forest.* 20(2): 205–206.

Abstract: A common weed, *Urtica urens* Linn., generally known as 'Small Nettle' has been reported first time for Tehri Garhwal from Khand Khalla, Athoor, earlier reported from Dehra Dun and Punjab. The present report of its occurrence from Tehri Garhwal extends its distributional range from outer to inner Himalayan valley, and is therefore significant phytogeographically.

1675. **Aswal, B.S. & Goel, A.K. 1985.** "Rare or lesser known plants from Garhwal and Kumaon". *J. Econ. Taxon. Bot.* 6(3): 729–731.

Abstract: Five lesser known species of plants, *Buddleja davidii* Franch. (Buddlejaceae), *Galium tibeticum* Aswal & Mehrotra (Rubiaceae), *Lithospermum officinale* L. (Boraginaceae), *Pentanema vestitum* (Wall. ex DC.) Ling (Asteraceae) and *Ribes orientale* Desf. (Grossulariaceae) have been collected from Garhwal and Kumaon regions of Uttar Pradesh.

1676. **Aswal, B.S. & Mehrotra, B.N. 1982.** "*Delphinium uncinatum* Hook.f. et Thoms. (Ranunculaceae) and *Lilium wallichianum* Schultes. f. (Liliaceae)– Two rare finds from North-West Himalaya". *J. Econ. Taxon. Bot.* 3: 773–775.

Abstract: *Delphinium uncinatum* Hook.f. et Thoms. has been rediscovered from Chamba district of Himachal Pradesh after a lapse of over 10 decades, earlier known from Banihal and *Lilium wallichianum* Schultes. f. rediscovered from Chamoli district of Uttar Pradesh after a lapse of over 13 decades, earlier known from Kumaon.

1677. **Aswal, B.S. & Mehrotra, B.N. 1983.** *Delphinium uncinatum* Hook.f. & Thorns. (Ranunculaceae) and *Lilium wallichianum* chultes f. (Liliaceae)– Two rare finds from Northwest Himalayas. In: Jain, S.K. (Ed.), *An Assessment of Threatened Plants of India.* Pp. 28–33. Botanical Survey of India, Calcutta.

1678. **Aswal, B.S. & Sharma, M.P. 1991.** "*Saxifraga lilacina* Duthie (Saxifragaceae)- An addition to the Indian flora". *J. Econ. Taxon. Bot.* 15(3): 701–702.

Abstract: *Saxifraga lilacina* Duthie has been reported for the first time for Indian flora from Munsiari, Pithoragarh district.

1679. **Aswal, B.S. & Srivastava, S.K. 1987.** "*Rumex gangotrianus* Aswal & S.K. Srivast. *sp. nov.* (Polygonaceae) from Gangotri, Uttarkashi". *Candollea* 42: 389–391.

1680. **Aziz, M.N. & Vohra, J.N. 1988.** "A note on the identity of *Hymenostylium xanthocarpum* (Hook.) Brid.". *Bull. Bot. Surv. India* 30(1-4): 185–187.

Abstract: In this paper, a description and drawing of this long forgotten and confused species *Hymenostylium xanthocarpum* (Hook.) Brid. Is presented in detail. This species was reported from Mussoorie, N.W. Himalaya.

1681. **Babu, C.R. 1966.** "Notes on some new distribution records for North India". *Bull Bot. Surv. India* 8: 200–201.

Abstract: *Alternanthera ficoidea* (L.) R. Br. ex Roem. & Schult. (Amaranthaceae), *Astragalus scorpiurus* Bunge (Fabaceae), *Ixeris sagittarioides* (Clarke) Stebbins and *Soliva anthemifolia* R.Br. (Asteraceae), *Lepidium virginicum* L. (Brassicaceae) and *Dipteracanthus beddomei* (Clarke) Santapau (Acanthaceae) have been reported for the first time for North India from Dehra Dun.

1682. **Babu, C.R. 1969a.** "*Galinsoga ciliata* (Raf.) Blake (Asteraceae)– A species new to India". *Bull Bot. Surv. India* 11(1&2): 184–185.

Abstract: *Galinsoga ciliata* (Raf.) Blake, a native of S. America, naturalised in England and recently recorded from Kathmandu, Nepal has been recorded for the first time for India from Rispana, Dehra Dun.

1683. **Babu, C.R. 1969b.** "*Trifolium tomentosum* Linn. (Fabaceae)– A new record for India". *Indian Forester* 95(2): 102.

Abstract: *Trifolium tomentosum* Linn., a native of Europe, now naturalised in Dehra Dun, is recorded here for the first time from India. A detailed description with relevant synonym and references, together with brief notes is provided.

1684. **Babu, C.R. 1970.** "*Peucedanum dehradunensis* Babu (Apiaceae)– A new species from N.W. Himalaya". *Indian Forester* 96(7): 535–536.

Abstract: A new species *Peucedanum dehradunensis* Babu allied to *P. dhana* Buch.-Ham. ex Clarke has been described and illustrated from Bindal-Ravines, Dehra Dun.

1685. **Badoni, A.K. 1990c.** "On the occurrence of *Plantago lanceolata* Linn. from Garhwal Himalayas". *Indian Forester* 116(3): 250.

Abstract: *Plantago lanceolata* Linn. has been collected for the first time for Garhwal Himalayas from north facing slopes of Bhutanu and Makuri-top in Thadiyar range of Purola Forest Division, Uttarkashi district. Earlier this species is known to occur only in Western Himalaya with a very restricted range viz., Kashmir to Shimla.

1686 **Bahadur, K.N. & Naithani, H.B. 1973.** "New distributional records of *Richardia scabra* Linn. in India". *Indian Forester* 99(7): 449–453.

Abstract: *Richardia scabra* Linn. (Rubiaceae), a native of tropical America and now naturalised in many parts of the world, has hitherto been reported in India from Assam, Meghalaya, Andhra Pradesh and Rajasthan. It is now recorded from Uttar Pradesh, Bihar and Mysore states. Notes on its previous records from India and other tropical countries, nomenclature (genus as well as species), description, distribution, ecology, economic uses and affinities are provided with illustrations.

1687. **Bahadur, K.N., Dayal, R. & Raturi, D.P. 1973.** "New plant records for the Upper Gangetic Plain". *J. Bombay Nat. Hist. Soc.* 70(3): 493–498.

Abstract: Five species are reported in this paper as new records for the Upper Gangetic Plain. These are: *Erigeron karvinskianus* DC., *Eupatorium riparium* Regel, *Hibiscus* *furcatus* Roxb., *Indigofera arrecta* Hochst. and *Justicia prostrata* (Clarke) Gamble. Apart from being a new record for the above mentioned area, *H. furcatus* is also reported here for the first time from the N.W. Himalayas. Illustration for this taxon as well as for *E. riparium* are provided.

1688. **Baleshwar & Datt, B. 2009.** "Additions to the flora of Lucknow district, Uttar Pradesh". *Indian J. Forest.* 32(4): 645–646.

Abstract: The present study reveals the occurrence of *Aristolochia bracteolata* Lam. and *Ipomoea coptica* (L.) Roem. & Schult. from Lucknow district as new additions to the flora of Lucknow district.

1689. **Balodi, B. & Malhotra, C.L. 1984.** "*Ribes grtffithii* Hook.f.– A new record for Western Himalaya". *J. Econ. Taxon. Bot.* 5(4): 985–986.

Abstract: *Ribes grtffithii* Hook.f. has been reported for the first time for India from Bogdiar bugyals. Hitherto this species was known to occur in the Eastern Himalaya (Bhutan and Siikim). With the present report the distributional range of this species extends to North Western Himalaya.

1690. **Balodi, B. & Malhotra, C.L. 1985.** "A note on *Scirpus cernuus* Vahl". *J. Econ. Taxon. Bot.* 7(2): 471.

Abstract: *Scirpus cernuus* Vahl has been reported for India from Askot-Nargan Nagar Bridal path, Gori valley.

1691. **Balodi, B. & Singh, S. 1988.** "A new species of *Androsace* L. (Primulaceae) from Hemkund in Garhwal Himalaya". *Bull. Bot. Surv. India* 30(1-4): 176–177.

Abstract: A new species of *Androsace* L., viz. *A. garhwalicum* allied to *A. selage* Hook.f. & Thoms. has been described and illustrated from Hemkund in Garhwal Himalaya.

1692. **Balodi, B. & Uniyal, B.P. 1987.** "*Maharanga wallichiana* A. DC.– A new record for India". *J. Econ. Taxon. Bot.* 11(1): 239–240.

Abstract: *Maharanga wallichiana* A. DC. has been reported for the first time for Indian flora from Kumaon, earlier reported from Nepal.

1693. **Basu, D. 1986.** "A new variety of *Elaeagnus parvifolia* Wallich ex Royle (Elaeagnaceae)". *J. Econ. Taxon. Bot.* 8(2): 427–429.

Abstract: A new variety of *Elaeagnus parvifolia* Wallich ex Royle viz., *E. parvifolia* var. *pedunculatus* has been described from Garhwal and Kumaon.

1694. **Basu, D. & Malhotra, C.L. 1984.** "*Elaeagnus kanaii* Momiyama– An addition to the Indian flora". *Bull. Bot. Surv. India* 26(1&2): 125–126.

Abstract: *Elaeagnus kanaii* Momiyama is reported here for the first time for flora of India from Jipti, Kumaon and Blume range, Uttar Pradesh.

1695. **Bhandari, M. 1973.** "A note on the occurrence of *Saccharum rufipilum* Steud. in the Dehra Dun Siwaliks". *Indian Forester* 99(4): 241–242.

Abstract: *Saccharum rufipilum* Steud., a grass of the temperate Himalayan region is being reported for the first time from the Dehra Dun Siwaliks at an altitude of 800 m.

1696. **Bhattacharjee, R. 2006a.** "New taxa of *Galium* L. (Rubiaceae) from the Indian Subcontinent". *Bull. Bot. Surv. India* 48(1-4): 59–72.

Abstract: Two sections of *Galium* L. Sect. *Asperigalium* and Sect. *Hirtiflorum* are described. Three new species and one new variety from the Indian subcontinent are described and illustrated. Of these *G. duthiei* and *G. duthiei* var. *glabriusculum* are from India (Uttaranchal) and adjoining W. Nepal. *G. kaganense* and *G. shanense* are from Pkistan and Myanmar respectively. Affinities of the sections are discussed.

1697. **Bhattacharjee, R. 2006b.** "Two new taxa of *Galium* (Rubiaceae) from India". *J. Econ. Taxon. Bot.* 30(3): 484–487.

Abstract: One new species viz., *Galium falconeri* allied to *G. hirtiflora* from Uttaranchal and Himachal Pradesh and one new variety *Galium javanicum* Bl. var. *pulneyense* from Tamil Nadu are described with illustrations.

1698. **Bhattacharyya, B. 1976.** "*Lolium remotum* Schrank var. *aristatum* (Doell.) Aschers (Poaceae)– A new record for India". *Curr. Sci.* 45: 277.

1699. **Bhattacharyya, S. & Jain, S.K. 1983.** "Three new taxa and four new names in the tribe Agrostideae (Poaceae) from India". *Bull. Bot. Surv. India* 25: 204–209.

Abstract: The paper provides detailed illustrated account of three new taxa, viz., *Agrostis tungnathii* allied to *A. royleana* Trin. from way to Tungnath, Chamoli district, Uttar Pradesh, *A. munroana* Aitch. et Hemsley subsp. *india* from Jammu & Kashmir, Himachal Pradesh & Uttar Pradesh, *Polypogon monspeliensis* (L.) Desf. var. *indicus* from Punjab and *Deyeuxia borii* from Nagaland and Meghalaya.

1700. **Bhattacharyya, U.C. 1963.** "*Soliva anthemifolia* R. Br. (Compositae)– A new record for India". *Bull. Bot. Surv. India* 5(3&4): 375–376.

Abstract: *Soliva anthemifolia* R. Br., a new record for India, is reported in this account from Northern districts of Uttar Pradesh. Complete description of the plant is given, as there are no specimens of this species is either in FRI Herbarium or the Calcutta Herbarium.

1701. **Bhattacharyya, U.C. 1964.** "*Circaeaster agrestis* Maxim. (Circaeasteraceae)– A new record from North Garhwal Himalaya". *Bull. Bot. Surv. India* 6(2-4): 297–298.

Abstract: *Circaeaster agrestis* Maxim. a monotypic member of the family Circaeasteraceae has been recorded for the first time for Garhwal Himalaya from Gangharea, about 1 km. towards Hemkund. Earlier this species was reported from Kumaun Himalaya, Sikkim, Central Nepal, Bhutan and north-western China.

1702. **Bhattacharyya, U.C. 1967.** "A new species of *Euphorbia* from N.W. Alpine Himalaya". *Bull. Bot. Soc. Bengal* 21: 35–36.

1703. **Bhattacharyya, U.C. 1969.** "New distributional records of orchids for West Himalaya". *Bull. Bot. Soc. Bengal* 23: 161–165.

1704. **Bhattacharyya, U.C. 1975.** "A new species of *Argyrolobium* (Papillionaceae) from West Himalaya". *Bull. Bot. Surv. India* 14: 175–177.

1705. **Bhattacharyya, U.C. & Goel, A.K. 1981.** "A report on some plants unknown from Garhwal Himalayas". *Bull. Bot. Soc. Bengal* 35: 99–101.

1706. **Bhattacharyya, U.C. & Goel, A.K. 1982.** "*Aphyllorchis parviflora* King & Pantl.– New distribution record of a rare orchid from Tehri Garhwal". *J. Econ. Taxon. Bot.* 4: 588–590.

Abstract: A rare saprophytic orchid *Aphyllorchis parviflora* King & Pantl. originally reported only from Sikkim has been discovered after more than eight decades from Tali, Tehri Garhwal. It is recorded for the first time from Western Himalaya and described with critical notes on rarity and ecology, supported by a photograph.

1707. **Bhattacharyya, U.C. & Singh, N.B. 1984.** "A note on the occurrence of *Rhodiola fastigiata* (Hook.f. et Thoms.) Fu (Crassulaceae) in the Himalaya". *Bull. Bot. Surv. India* 26(3&4): 192–194.

Abstract: The female plant of *Rhodiola fastigiata* (Hook.f. et Thoms.) Fu has been collected after a gap of over 100 years from the environs of Lake Hemkund, Garhwal Himalaya. Previously this species was reported from Garhwal in 1846-1849, Sikkim and Kashmir.

1708. **Bhattacharyya, U.C. & Uniyal, B.P. 1973.** "On the collection of *Dichanthium pallidum* (Hook.f.) Stapf ex C.E.C. Fischer in Northern India". *Bull. Bot. Surv. India* 15(1&2): 167.

Abstract: *Dichanthium pallidum* (Hook.f.) Stapf ex C.E.C. Fischer has been recorded for the first time for Northern India from Mirzapur, Uttar Pradesh. Ealier this species was reported from Andhra Pradesh (Nellore) & West Bengal (24-Parganas).

1709. **Bhattacharyya, U.C. & Viswanathan, M.V. 1973.** "A new variety of *Saxifraga poluniniana* H. Smith from Western Himalaya". *Bull. Bot. Surv. India* 15(3&4): 269–271.

Abstract: A new variety of *Saxifraga* viz. *S. poluniniana* var. *mucronata* Bhattacharyya & Viswanathan *allied to S. poluniniana* H. Smith has been described and illustrated Kukinakhal, Eastern Chamoli, Garhwal (Western Himalaya).

1710. **Bhattacharyya, U.C., Agarwal, S. & Goel, A.K. 1979.** "*Gentiana albicalyx* Burkill (Gentianaceae)– First report of its occurrence in N.W. Himalaya". *Bull. Bot. Surv. India* 21(1-4): 208–209.

Abstract: The present discovery of *Gentiana albicalyx* Burkill from Panwali Kantha in Tehri district, N.W. Himalaya is of considerable interest for understanding the phytogeographical range of distribution of this species to the western limi of the Himalayas. Previously this species was reported from Sikkim (E. Himalaya).

1711. **Binojkumar, M.S. & Balakrishnan, N.P. 1991.** "*Euphorbia cotinoides* Miq. (Euphorbiaceae)– A new record for India". *J. Econ. Taxon. Bot.* 15(2): 463–464.

Abstract: *Euphorbia cotinoides* Miq. has been reported for the first time for India from Uttar Pradesh, Maharashtra, Karnataka and Kerala.

1712. **Bisht, S. & Adhikari, B.S. 2014.** "*Dendrobium longicornu:* An addition to the orchid flora of western Himalaya". *Richardiana* 14: 157–168.

Abstract: *Dendrobium* is one of the largest genera of the Orchidaceae. Hitherto, 116 species of the genus have been reported from India, of which 17 (including 2 doubtful taxa) have been recorded from Western Himalaya and 7 from the Askot Wildlife Sanctuary (AWS). By this publication, we add *Dendrobium longicornu* to the flora of Western Himalaya.

1713. **Biswas, S. 1983.** "Three new taxa in *Indigofera* Linn. (Papilionaceae) from North-Western Himalaya". *Indian J. Forest.* 6(4): 318–322.

Abstract: Three new taxa of *Indigofera* Linn. (Papilionaceae) viz., *I. byansghatensis* allied to *I. cassioides* Rottl. ex DC. from Byansghat (Garhwal), *I. cassioides* Rottl. ex DC. var. *mussooriensis* and *I. himalayensis* Ali var. *retusa* both from Mussoorie has been described from North-Western Himalaya.

1714. **Biswas, S. 1985.** "Two new taxa in *Clematis connata* DC. (Ranunculaceae) and *Trachelospermum lucidum* (D. Don) Schum. (Apocynaceae) from North-Western Himalaya". *Indian J. Forest.* 8(1): 61–63.

Abstract: *Clematis connata* DC. var. *lanceolata* var. nov. (Ranunculaceae) and *Trachelospermum lucidum* (D. Don) Schum. var. *osmastoniana* var. nov. (Apocynaceae) from Tehri Garhwal, North-Western Himalaya are described and illustrated.

1715. **Biswas, S. 1986.** "Three new taxa in *Caragana* (Fabaceae) from North-western Himalaya". *Indian J. Forest.* 9(1): 70–73.

Abstract: *Caranga beefensis* sp. nov., *C. beefensis* var. *auriculata* var. nov. and *C. brevispina* Royle ex Benth. var. *gamblei* var. nov., all ligneous are described alongwith their latin diagnosis. Illustration on new species and detailed account on other two varieties are provided.

1716. **Biswas, S. & Chandra, S. 1997.** "*Indopiptadenia oudhensis* (Brandis) Brenan– An endangered tree legume of Uttar Pradesh and Nepal". *Indian Forester* 123(5): 419–421.

Abstract: Taxonomic status of *Indopiptadenia oudhensis* (Brandis) Brenan, a monotypic taxon typically of American and African origin has been elucidated with particular emphasis on distribution, phenology and measures proposed for conservation.

1717. **Bor, N.L. 1942.** "A new grass from the Himalaya". *Indian Forester* 68(7): 355–356.

Abstract: A new species of grass viz., *Calamagrostis garhwalensis* C.E. Hubbard & N.L. Bor allied to *C. littorae* has been described and illustrated from Kedarnath.

1718. **Chandra, A., Dhakad, A.K. & Kewat, A.K. 2017.** "*Sophora mollis* (Royle) Baker: A threatened species of Uttarakhand". *Ann. Forest.* 25(1&2): 31–33.

Abstract: *Sophora mollis* (Royle) Baker is a threatened species of the family Fabaceae. In the present study, survey of population status of the species was carried out in the Sahastradhara and adjoining areas of Uttarakhand, India. It is reported that species has very restricted distribution and low population. It is suggested that suitable conservative measures should be taken to save the species from extinction in near future.

1719. **Chandra, S. & Bennet, S.S.R. 1991.** On the occurrence of *Acalypha lanceolata* Willd. in Rajaji National Park (Uttar Pradesh). In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J Forest.* Addl. Ser.*]* 2: 41–42. Bishen Singh Mahendra Pal Singh, Dehra Dun.

Abstract: *Acalypha lanceolata* Willd. has been reported for the first ime for the flora of Uttar Pradesh from Chilla, Rajaji National Park. Earlier this species was reported from South Maharashtra and Rajasthan.

1720. **Chandra, S. & Rawat, D.S. 2016.** "*Drymaria villosa* (Caryophyllaceae), new record for the flora of Western Himalaya". *J. Asia-Pacific Biodiv.* 9: 97–99.

Abstract: The herb Drymaria *villosa* is reported first time from the Western Himalaya. This species is morphologically similar to *Drymaria cordata* ssp. *diandra* but can be distinguished by its delicate individuals, villous vestiture, orbicular to reniform leaves, auriculate oblong bifid petals, and numerous reniform seeds. The present collection of the species represents western most distributional limit in the Asian continent from Uttarakhand. Morphological characteristics of the species were examined, which are illustrated here. Key to differentiate it from closely allied species is also provided.

1721. **Chandra, S. & Rawat, D.S. 2017.** "*Arenaria thangoensis* W.W. Sm. (Caryophyllaceae), a threatened species hitherto considered endemic to Sikkim rediscovered from the Western Himalaya, India". *Curr. Sci.* 112(4): 693–695.

Abstract: *Arenaria thangoensis* W.W. Sm. (Caryophyllaceae), a threatened species hitherto considered endemic to Sikkim has been rediscovered from Kuari Pass alpine zone, Chamoli district, Uttarakhand in the Western Himalaya after a gap of of 106 years.

1722. **Chandra, S., Rawat, D.S. & Pusalkar, P.K. 2017.** "Recollection of the Black Catchfly *Silene nigrescens* (Caryophyllales: Caryophyllaceae) after 130 years from Indian western Himalaya". *J. Threatened Taxa* 9(7): 10476–10479.

Abstract: *Silene nigrescens* has been re-collected after a gap of 130 years from Pangarchulla area of District Chamoli, Uttarakhand, India. This species was earlier collected by J.F. Duthie from the above-mentioned location in 1885. On the basis of J.F. Duthie's collection this species is known from only two localities (Pangarchula area and Nila valley) in western Himalaya. Due to a dispersed type of distribution, extremely rare occurrence and poor herbarium history, this species should be considered as a conservation dependent species in the western Himalaya.

1723. **Chandra, S., Rawat, D.S. & Rastogi, J. 2015. "**Recollection of *Stellaria congestiflora* H. Hara (Caryophyllaceae) with new distribution record from Western Himalaya". *Trop. Pl. Res.* 2(2): 153–155.

Abstract: *Stellaria congestiflora* H. Hara (Caryophyllaceae) is an endemic herb found in alpine zones of Tibet and Himalayan regions. The species was described by Hara (1977) from Taglung, South of Tukucha, Kali Gandaki, Nepal and known to be common near the base of Mount Everest, Nepal. Globally the species has been recorded in Xizang area (Tibet) China, Bhutan, Nepal and India (Grierson 1984, Press et al. 2000, Pusalkar & Singh 2010, Shilong & Rabeler 2001). In India this species is represented by only two specimens; one from Sikkim (Below Phaklung rocky gully, Lasha Chhu, North district) and other from Uttarakhand (opposite Gothing, Chamoli). From Uttarakhand this species was collected by B.D. Naithani in 1975 but he erroneously identified specimens as *Arenaria festucoides* Benth. Later, Pusalkar & Singh (2010) correctly identified specimen as *Stellaria congestiflora* and reported its presence in India from Uttarakhand and Sikkim. On account of only two collections in Indian Himalayan region this species is rare, though it is reported common in Nepal Himalaya. After a long gap this species were recollected from Homkundi area near Shila samudra glacier in district Chamoli, Uttarakhand state, India.

1724. **Chandra Sekar, K., Rawat, B. & Rawal, R.S. 2010.** "*Taraxacum lanigerum* Van Soest (Asteraceae)– A new record for Uttarakhand". *Ann. Forest.* 18(2): 331–332.

Abstract: *Taraxacum lanigerum* Van Soest constitutes a new record for the state of Uttarakhand from Baling-Dugtu, Dharchula, Pithoragarh district.

1725. **Chandra Sekar, K., Gairola, S., Rawat, B. & Rawal, R.S. 2008.** "*Avena fatua* subsp. *meridionalis* Malz. (Poaceae)– A new record for Uttarakhand". *Ann. Forest.* 16(2): 361–362.

Abstract: The occurrence of *Avena fatua* L. subsp. *meridionalis* Malz. in Senderdunga area, Bageshwar district, Uttarakhand shows its extended eastward distribution in the Indian Himalaya and constitutes a new record for the state of Uttarakhand. Previously this species was reported from Himachal Pradesh and Jammu & Kashmir.

1726. **Chandra Sekar, K., Giri, L., Pandey, A. & Srivastava, S.K. 2015.** "A note on distribution of *Jurniperus semiglobosa* in Uttarakhand, India". *Indian J. Forest.* 38(1): 79–80.

Abstract: Distribution of *Jurniperus semiglobosa* in India has been examined through literature, available herbarium specimens and with field observations. The density of individuals are found in decreasing trend in India due to fuel wood extraction coupled with natural calamity in high altitude regions, especially in Trans Himalaya. Available population status, brief description, field observations and photographs are provided in the communication, for conservation of *Jurniperus* in natural habitats.

1727. **Chandra Sekar, K., Rawal, R.S., Gairola, S. & Rawat, B. 2012.** "*Arnebia nandadeviensis* (Boraginaceae), a new species from India". *J. American Sci.* 5(2): 105–106.

Abstract: A new species of *Arnebia* Forsk. (Boraginaceae), *A. nandadeviensis* K. Chandra Sekar & R.S. Rawal allied to *A. euchroma* I.M. Johnston has been described from Nanda Devi Biosphere Reserve, Uttarakhand, India.

1728. **Chandra Sekar, K., Srivastava, S.K., Singh, D.K. & Murti, S.K. 2003.** "Genus *Brachypodium* P. Beauv. (Poaceae) in India". *Phytotaxonomy* 3: 60–62.

Abstract: The present paper deals with the taxonomic and distributional status of genus *Brachypodium* P. Beauv. in India. Occurrence of *Brachypodium pinnatum* (L.) P. Beauv. in Indian flora is firmly established.

1729. **Chandra Sekar, K., Pandey, A., Bhatt, D., Dey, D., Bisht, K. & Rawal, R.S. 2018.** "*Allardia stoliczkae* C.B. Clarke (Asteraceae)– A new record for the Uttarakhand, India". *Indian Forester* 144(5): 487–488.

Abstract: *Allardia stoliczkae* C.B. Clarke (Asteraceae) has been recorded for the first time for Uttarakhand from cold desert areas of Byans valley, Pithoragarh district.

1730. **Chaudhary, L.B. & Khan, Z.H. 2005.** "A new species of *Astragalus* L. (Fabaceae) from Indo-Nepal region". *Rheedea* 15: 129–131.

Abstract: *Astragalus sanjappae* Chaudhary & Khan, a new species in Fabaceae, is described from Indo-Nepal region. This species is closely allied to *A. tenuicaulis* Benth. ex Bunge and *A. sikkimensis* Benth. ex Bunge but differs from both in having leaflets hairy on both sides, calyx teeth very minute, keel petals shorter than wing petals and distinctly stipitate pods. It is illustrated.

1731. **Chaudhary, L.B. & Khan, Z.H. 2006.** "*Astragalus uttaranchalensis* (Leguminosae-Papilionoideae)– A new species from the Himalaya in India". *Taiwania* 51: 36–40.

Abstract: A new species of *Astragalus, A. uttaranchalensis* Chaudhary & Khan (Chirbasa, Uttarkashi, from the Indian Himalayan State Uttaranchal) is described and illustrated. *Astragalus uttaranchalensis* is closely related to *A. emodi* Steud., but differs from the latter in shape of stipules, length of inflorescence, number of flowers in each raceme, nature of bracts and size of calyx teeth.

1732. **Chauhan, V., Vaishya, J.K., Magesh, C.R. & Ansari, A.A. 2017.** "*Indigofera zollingeriana* Miq. (Fabaceae: Indigofereae), a new record for Uttar Pradesh, India". *Indian J. Forest.* 40(4): 381–383.

Abstract: Present communication deals with new distributional record of *Indigofera zollingeriana* Miq. (Fabaceae) in Hindon, Ghaziabad district, Uttar Pradesh, India.

1733. **Chhetri, G., Hynniewta, T.M. & Borthakur, S.K. 2007.** "*Juncus khasiensis* Buchenau (Juncaceae), a new record to western Himalaya". *Indian Forester* 133(6): 846–848.

Abstract: *Juncus khasiensis* Buchenau has been reported for the first time for Western Himalaya from Amritganga valley, Garhwal and Tungnath, Chamoli of Uttarakhand, earlier known only from Eastern Himalaya.

1734. **Chowdhery, H.J. & Agrawala, D.K. 2008.** "*Pleione hookeriana* (Lindl.) B.S. Williams– An interesting orchid species from Garhwal Himalaya". *Indian J. Forest.* 31(1): 147–149.

Abstract: *Pleione hookeriana* (Lindl.) B.S. Williams is reported here for the first time from Garhwal Himalaya. A brief description along with photographs is provided.

1735. **Chowdhery, H.J. & Debta, M.R. 2009.** "A new species of *Ipomoea* L. (Convolvulaceae) from India". *Indian J. Forest.* 32(1): 119–121.

Abstract: A new species of the genus *Ipomoea* L. viz., *Ipomoea laxiflora* allied to *I. triloba* L., (Convolvulaceae) is described and illustrated from Kaulagarh road, Dehra Dun, Uttarakhand.

1736. **Chowdhery, H.J. & Rao, R.R. 1985.** "*Rorippa pseudoislandica* Chowdhery et R.R. Rao– A new species of Brassicaceae from India". *Indian J. Forest.* 8(2): 150–152.

Abstract: A new species of Brassicaceae viz., *Rorippa pseudoislandica* Chowdhery et R.R. Rao allied to *R. islandica* (Oeder) Borbas has been described and illustrated from Bela Tal, Hamirpur district, Uttar Pradesh, India.

1737. **Chowdhery, H.J. & Singh, S. 1985.** "A new species of *Pegaeophyton* (Brassicaceae) from North-Western Himalaya". *Indian J. Forest.* 8(4): 335–337.

1738. **Dangwal, L.R. & Gaur, R.D. 2000.** "A new species of *Oxytropis* DC. (Fabaceae) from Garhwal Himalaya". *J. Econ. Taxon. Bot.* 24: 358–360.

Abstract: A new species of *Oxytropis* DC. viz., *O. rautii* allied to *O. cachemiriana* Cambess. has been described and illustrated from Nandanvan area above Gaumukh glacier, Uttarkashi district, U.P., Garhwal Himalaya.

1739. **Dangwal, L.R. & Gaur, R.D. 2002.** "A new species of *Desmodium* Desvaux., Fabaceae from Garhwal Himalaya, Uttaranchal, India". *J. Bombay Nat. Hist. Soc.* 99(1): 96–99.

Abstract: During the field survey and plant exploitations in the remote localities of the Garhwal Himalaya (NW Himalaya) the authors collected some interesting specimens of the genus *Desmodium* Desvaux. (Fabaceae) from Nauti (Chamoli district), Uttaranchal, from the scrub jungles along trakking routes. Through study of the literature and comparison of the specimens of the regional herbaria housed at the Botanical Survey of India, Northern Circle (BSD) and Forest Research Institute (DD), Dehra Dun, indicate distinct differences between *D. garhwalensis* sp. nov. and *D. elegans* DC.

1740. **Dangwal, L.R. & Rawat, D.S. 1996a.** "A new species of *Pueraria* DC. (Fabaceae) from Garhwal Hirnalaya, U.P., India". *J. Bombay Nat. Hist. Soc.* 93(3): 570–572.

Abstract: A new species of *Pueraria* DC., viz., *P. garhwalensis* allied to *P. ferruginea* Kurz has been described and illustrated from Tehri district, Garhwal Himalaya, Uttar Pradesh.

1741. **Dangwal, L.R. & Rawat, D.S. 1996b.** "A new species of *Ranunculus* L. (Ranunculaceae) from north west Himalaya, U.P., India". *J. Econ. Taxon. Bot.* 20(3): 703–705.

Abstract: A new species of *Ranunculus* L., viz., *R. gaurii* allied to *R. lingua* L. has been described and illustrated from Tapovan, Uttarkashi district, Uttar Pradesh.

1742. **Dangwal, L.R., Gaur, R.D. & Nautiyal, D.C. 1997.** "Some rare and uncommon legumes from Garhwal Himalaya". *J. Econ. Taxon. Bot.* 21(1): 47–51.

Abstract: Some uncommon and rare legumes viz., *Astragalus ladakensis* Balakr., *Cicer microphyllum* Benth., *Lathyrus pratensis* L. and *Pueraria phaseolaodes* (Roxb.) Benth. have been reported from the remote localities of Garhwal Himalaya.

1743. **Dangwal, L.R., Rawat, D.S. & Gaur, R.D. 1993.** "Some interesting and rare plants of Fabaceae from Garhwal Himalaya". *J. Indian Bot. Soc.* 72: 317–318.

Abstract: Some interesting plants of Fabaceae viz., *Astragalus bakeri* Ali, *Cajanus crassus* (Prain & King) van der Maesen, *Crotalaria medicaginea* var. *neglecta* (Wight & Arn.) Baker and *Oxytropis lapponica* (Wahl) Gay has been recorded from Garhwal Himalaya.

1744. **Dangwal, L.R., Rawat, D.S. & Gaur, R.D. 1994a.** "New records of Fabaceae from Garhwal Himalaya". *J. Bombay Nat. Hist. Soc.* 91(3): 470–471.

Abstract: Four rare and interesting specimens of the family Fabaceae viz., *Desmodium laxum* DC., *D. neomexicanum* A. Gray, *Lotus corniculatus* L. and *Trigonella fimbriata* Royle ex Benth. have been recorded from Garhwal Himalaya along with short notes on the distribution, localities, approximate elevation, collector's herbarium number and their line drawing.

1745. **Dangwal, L.R., Rawat, D.S. & Gaur, R.D. 1994b.** "Some rare and less known Legumes from Garhwal Himalaya". *J. Indian Bot. Soc.* 73: 311–313.

1746. **Dangwal, L.R., Rawat, D.S. & Gaur, R.D. 1995.** "Some rare and interesting plants of Fabaceae from Garhwal Himalaya". *Indian J. Forest.* 18(3): 255–257.

Abstract: Some rare and interesting plants belong to the family Fabaceae viz., *Lathyrus erectus* Lagasca, *L. laevigatus* (Waldst. & Kit.) Grenier subsp. *emodi* (Wall. ex Fritsch.) Ohashi, *Rhynchosia capitata* (Heyne ex Roth) DC. and *Trigonella incisa* Benth. have been reported for the first time from Garhwal Himalaya.

1747. **Dangwal, L.R., Rawat, D.S. & Gaur, R.D. 1996.** "Some new records of Legumes from Garhwal Himalaya". *J. Bombay Nat. Hist. Soc.* 93(1): 113–115.

Abstract: Six species of the family Fabaceae viz., *Astragalus cashmiriansis* Bunge, *Crotalaria burhia* Buch.-Ham. ex Benth., *Dalbergia latifolia* Roxb., *Desmodium tortuosum* (Swartz) DC., *Dolichos tenuicaulis* (Baker) Craib and *Dumasia villosa* DC. have been recorded for the first time from the remote localities of Garhwal Himalaya along with flowering and fruiting period, habitat, occurrence, approximate distributional range and availability and collector's herbarium number.

1748. **Das, D.S., Dash, S.S., Thakur, R.K., Rawat, D.S. & Sinha, B.K. 2019.** "First record of *Rhododendron arboretum* var. *roseum* (Ericaceae) from the western Himalaya, India". *Indian J. Forest.* 42(3): 243–246.

Abstract: *Rhododendron arboretum* var. *roseum* Lindl. is known only from the eastern part of the Indian Himalaya so far. The present communication is a documentation of this taxon from Bhyundar Valley (Chamoli, Uttarakhand), extending its distributional range to the western Himalaya. Detailed morphological description with its phenological, ecological and distributional information is presented. Its conservation status and a note are also provided.

1749. **Dash, S.S., Dutta Pramanick, D., Kumar, S., Singh, P. & Mao, A.A. 2018.** "New additions to the Indian flora in 2016". *Phytotaxonomy* 18: 1–12.

Abstract: The present communication enumerates the new discoveries of plants (excluding microbes) during 2016 from India. A total number of 7 new genera, 186 new species, 4 subspecies and 9 new varieties were discovered as new to science, while 1 family, 4 genera, 75 species, 27 subspecies, 4 varieties and 2 forma were reported as new distributional records for Indian flora. Some of these newly discovered plants are potentially important for agricultural, pharmaceutical, food supplements, dye and tanning industries in future.

1750. **Datt, B. & Kapoor, S.L. 1994.** "*Pegia nitida* Colebr.– A new record for Western Himalaya". *J. Bombay Nat. Hist. Soc.* 91(1): 160.

Abstract: *Pegia nitida* Colebr. has been recorded for the first time for Western Himalaya from Paritibba forest near Woodstock school, Mussoorie. Earlier this species was reported from Assam, Manipur, Sikkim and Tripura, Nepal, Bhutan, Myanmar, Bangladesh, China and Philippines.

1751. **Deva, Som. 1969.** "Two new records of orchids from Dehra Dun". *Indian Forester* 95(4): 268–269.

Abstract: Two terrestrial orchids, *Nervilia infundibulifolia* Blatt. & McC. and *N. monantha* Blatt. & McC., reported to be occurring only in Western India, have now been recorded from Dehra Dun in North India.

1752. **Deva, Som. 1978a.** "New or little known plants from Garhwal Himalaya". *Indian J. Forest.* 1(2): 163–165.

Abstract: Sixty species has been collected for the first time from Garhwal Himalaya.

1753. **Deva, Som. 1978b.** "New or little known plants from Garhwal Himalaya- II". *Indian J. Forest.* 1(4): 345–348.

Abstract: In the present communication, sixty seven species has been recorded for the first time for Garhwal Himalaya.

1754. **Deva, Som. 1980.** "New or little known plants from Garhwal Himalaya- III". *Indian J. Forest.* 3(2): 148–153.

Abstract: In the present communication 105 plants have been reported from Garhwal Himalaya.

1755. **Deva, Som. 1982.** "*Malaxis biaurita* (Lindl.) O. Ktze.– A new record for North Western Himalaya". *Indian J. Forest.* 5(3): 242–244.

Abstract: *Malaxis biaurita* (Lindl.) O. Ktze. has been recorded for the first time for North Western Himalaya from Laxman Sidh, Dehra Dun.

1756. **Deva, Som & Arora C.M. 1971.** "On the occurrence of *Tropidia curculigoides* Lindl. at Golatappar, Dehra Dun". *Indian Forester* 97(12): 699–700.

Abstract: *Tropidia curculigoides* Lindl. a terrestrial orchid reported previously from Sikkim, Assam and Burma, has now been recorded from Golatappar Swamp forest, Dehra Dun.

1757. **Deva, Som & Naithani, H.B. 1974.** "Addition to the Cyperaceae of Dehradun valley and the adjacent Shiwalik". *Indian Forester* 101(3): 205.

Abstract: *Cyperus cyperinus* (Retz.) Sar. var. *maximus* (Cl.) Kukenthal, *C. elatus* Linn. var. *macronux* C.B. Clarke, *C. sanguinolentus* Vahl subsp. *cyrtostachys* (Miq.) Kern and *C. sanguinolentus* Vahl. var. *micronux* (Cl.) Kukenthal has been recorded for the first time for Northern India from Dehra Dun and adjacent Siwaliks and *Cyperus haspan* Linn. subsp. *juncoides* (Lam.) Kukenthal has been reported for the first time for India from Knasro.

1758. **Deva, Som & Naithani, H.B. 1984.** "*Ranunculus trilobus* Desf.– A new record for India from Kumaon". *Indian J. Forest.* 7(4): 337–338.

Abstract: *Ranunculus trilobus* Desf. has been reported for the first time for Indian flora from Baijnath, Almora district, Kumaun (Uttar Pradesh).

1759. **Deva, Som & Naithani, H.B. 1985.** "Genus *Colocasia* Schott (Araceae) in Garhwal Himalaya". *Indian J. Forest.* 8(1): 75–78.

Abstract: Three species of the genus *Colocasia* Schott, viz., *C. esculenta* (Linn.) Schott, *C. esculenta* var. *antiquorum* (Schott) Hubb. and *C. affinis* Schott of the family Araceae has been reported from Garhwal Himalaya.

1760. **Deva, Som & Naithani, H.B. 1989.** "*Paspalum longifolium* Roxb.: A grass new to Uttar Pradesh, India". *J. Bombay Nat. Hist. Soc.* 86(2): 279.

Abstract: *Paspalum longifolium* Roxb. has been recorded for the first time for the grass flora of Uttar Pradesh from Nakraunda, Dehra Dun. Earlier reported from Northeast India, Kerala, Gujarat and Madhya Pradesh.

1761. **Deva, Som & Naithani, H.B. 1990.** "*Ipomoea triloba* Linn.– A new record for Uttar Pradesh from Dehra Dun". *Indian Forester* 116(9): 755–756.

Abstract: *Ipomoea triloba* Linn. a native of tropical America is now reported for the first time for Uttar Pradesh from Dehra Dun.

1762. **Dhasmana, V. 1978.** "A new record for Dehra Dun". *Indian J. Forest.* 1(3): 246.

Abstract: *Ephorbia peplus* Linn. has been recorded for the first time for Dehra Dun from Rajpur road.

1763. **Dhawan, M. & Gupta, B.K. 1987.** "A note on the occurrence of a rare Indian species of *Eremostachys* at Mohand (Dehra Dun)". *Indian J. Forest.* 10(1): 73–74.

Abstract: A rare Indian species of *Eremostachys* viz., *E. Superba* Royle ex Benth. (Lamiaceae) has been recollected from Mohand area- 20 km from Dehra Dun on Dehra Dun-Saharanpur road after a gap of a century from its type locality.

1764. **Dixit, R.D. & Vaish, U.S. 1986.** "*Hibiscus heterophyllus* Vent.– A newly introduced ornamental shrub from Australia". *Bull. Bot. Surv. India* 29(1-4): 174–176.

Abstract: *Hibiscus heterophyllus* Vent., native of Australia has been introduced for the first time in India and is well established in the Experimental Garden of Central Circle, BSI, Allahabad.

1765. **Dixit, S.K. & Dutt, B. 1985.** "Additions to the flora of Fatehpur district (U.P.)". *J. Econ. Taxon. Bot.* 6(3): 647–651.

Abstract: The present paper is an enumerated account of 33 species of angiosperms which are additions to the flora of Fatehpur district.

1766. **Dixit, S.K. & Dutt, B. 1990.** "On the recollection of some rare taxa from Upper Gangetic plain". *J. Econ. Taxon. Bot.* 14(2): 405–407.

Abstract: Six rare taxa, viz., *Ctenolepis garcinii* (Burm.f.) Clarke (Cucurbitaceae), *Pluchea tomentosa* DC. (Asteraceae), *Cyperus meeboldii* Kuk. (Cyperaceae), *Cenchrus pennisetiformis* Hochst. & Steud., *Sporobolus helvolus* (Trin.) Dur. & Schinz and *Tetrapogon tenellus* (Koen. & Roxb.) Chiov. (Poaceae) has been collected after a long period from Fatehpur district of Uttar Pradesh.

1767. **Dixit, S.N. & Siddiqui, M.O. 1966.** "*Cardenthera pinnatifida* Benth.– A new record for Northern India". *Indian Forester* 92(12): 739–741.

Abstract: *Cardenthera pinnatifida* Benth., an aromatic herb of the family Acanthaceae, has been recorded only from south Konkan and Deviman Ghats (North Kanara). However, recently the authors have observed a very rich and luxuriant growth of this plant in Pokharbhinda, a village about 20 km east of Gorakhpur city. The plant is believed to be an effective blood purifier, and, therefore, a detailed pharmaceutical study is suggested.

1768. **Dixit, S.N. & Singh, A.K. 1968.** "*Synnema triflorum* (Roxb. *ex* Nees) O. Kuntze– A new record for Upper Gangetic Plain". *Indian Forester* 94(10): 769–771.

Abstract: This note presents *Synnema triflorum* (Roxb. ex Nees) O. Kuntze, a a new record for Upper Gangetic plain from Tura Nala, Ramgarh forest, Gorakhpur and furnishes important informations regarding its habit, habitat, exact localities of occurrence and frequency in the area.

1769. **Dixit, S.N., Verma, S.D. & Srivastava, T.N. 1966.** "Additions to the rainy season weeds of Gorakhpur". *Proc. Natl. Acad. Sci., India B* 36(2): 149–156.

1770. **Dubey, H.S. 1985.** "An additional taxon in tribe Triticeae in India". *J. Econ. Taxon. Bot.* 7(3): 566–567.

Abstract: A single specimen of *Elymus* L., viz., *E. tschimganicus* (Drob.) Tzvelev under tribe Triticeae has been reported from Mussoorie, north-west Himalaya. Thorough scrutiny of literature revealed its no record from adjacent territory.

1771. **Gamble, J.S. & Prain, D. 1901.** "Description of a new genus of Orobanchaceae". *J. Asiat. Soc. Bengal,* Pt. H, 69: 489.

1772. **Garg, A. & Joshi, B. 2015.** "New record of *Emilia javanica* (Burm.f.) C.B. Rob. and *Inula falconeri* Hook.f. (Asteraceae) in Uttar Pradesh, India". *Indian J. Forest.* 38(4): 351–352.

Abstract: *Emilia javanica* (Burm.f.) C.B. Rob. and *Inula falconeri* Hook.f. of family Asteraceae are reported for the first time for Uttar Pradesh from Upper Ganga Ramsar site.

1773. **Gaur, R.C. & Dayal, R. 1989.** "*Rubia cordifolia* L. var. *cordifolia* forma *strigosa* Deb & Malick– A new record for western Himalaya". *Van Vigyan* 7: 314.

1774. **Gaur, R.D. 1981.** "*Arceuthobium minutissimum* Hook.f.– A new record from Upper Gangetic Plain". *Geobios* 8: 41.

1775. **Gaur, R.D. 1992.** "A new *Sagina* L. (Caryophyllaceae) from North West Himalaya". *J. Bombay Nat. Hist. Soc.* 89(2): 236–238.

Abstract: A new species of *Sagina* L. viz., *S. purii* allied to *S. saginoides* (L.) Karsten has been described and illustrated from Sanana, Almora district of Uttar Pradesh.

1776. **Gaur, R.D. & Dangwal, L.R. 1997.** "A new species of *Macrotyloma* (Wight and Am.) Verdc. (Fabaceae) from Garhwal Himalaya, U.P., India". *J. Bombay Nat. Hist. Soc.* 94(2): 381–383.

Abstract: A new species of *Macrotyloma* (Wight and Am.) Verdc. viz., *M. sar-garhwalensis* has been described and illustrated from Sara village, Pauri district, Uttar Pradesh.

1777. **Gaur, R.D. & Nautiyal, D.C. 1995.** "*Poa kanaii* Rajb. and *Poa mustagenensis* Rajb., new record to India from Garhwal Himalaya". *J. Econ. Taxon. Bot.* 19(2): 469–471.

Abstract: Two interesting species of *Poa* viz., *Poa kanaii* Rajb. and *Poa mustagenensis* Rajb. has been recorded for the first time for Indian flora from Uttarkashi district of Garhwal Himalaya. Both these species are earlier reported from alpine zones of central Nepal.

1778. **Gaur, R.D. & Nautiyal, D.C. 1996a.** "Some little known and rare high altitude species of *Poa* from Garhwal Himalaya". *J. Bombay Nat. Hist. Soc.* 93(2): 324–327.

Abstract: Ten little known and rare high altitude species of *Poa* viz., *Poa aitchisonii* Boiss., *P. bacteriana* Roshev., *P. bulbosa* L., *P. himalayana* Nees ex Steud., *P. khasiana* Stapf, *P. koelzii* Bor, *P. pratensis* L., *P. pratensis* subsp. *alpigena* (Blytt.) Hitt., *P. pratensis* subsp. *anguistifolia* (L.) Gaud. and *P. sterlis* M. Bieb. has been reported from Garhwal Himalaya. A key to these little known species of *Poa* together with brief description along with their habitat, occurrence, approximate elevation and collector's herbarium number is given.

1779. **Gaur, R.D. & Nautiyal, D.C. 1996b.** "*Calamagrostis stolizkai* Hook.f. and *Glyceria thomsoni* Stapf– Little known grasses to India". *J. Econ. Taxon. Bot.* 20(2): 266–268.

Abstract: Two interesting plants from Poaceae viz., *Calamagrostis stolizkai* Hook.f. and *Glyceria thomsoni* Stapf have been reported for the first time for India from Leptal (Pithoragarh) and Yamnotri (Uttarkashi), respectively.

1780. **Gaur, R.D. & Nautiyal, D.C. 1997.** "*Poa nephelophila* Bor– A new record to India from Garhwal Himalaya". *J Bombay Nat. Hist. Soc.* 94(3): 601.

Abstract: *Poa nephelophila* Bor has been reported for the first time for Garhwal Himalaya from Yamnotri, Uttarkashi.

1781. **Gaur, R.D. & Silas, R.A. 1988.** "*Bidens cernua* L. (Asteraceae)– A rare species of North-west Himalaya". *Indian J. Forest.* 11(1): 93–94.

1782. **Gaur, R.D., Dangwal, L.R. & Rawat, D.S. 1993.** "Some rare and little known plants of Fabaceae from Garhwal Himalaya". *J. Indian Bot. Soc.* 72: 21–23.

Abstract: Rare species of Fabaceae viz., *Argyrolobium roseum, Astragalus psilocentros* var. *pilosus, Desmodium benthamii* and *D. renifolium* has been reporded from Garhwal Himalaya.

1783. **Gaur, R.D., Dangwal, L.R. & Rawat, D.S. 1994.** "Some rare plants of Fabaceae from Garhwal Himalaya". *Indian J. Forest.* 17(1): 80–83.

Abstract: Some interesting legumes viz., *Astragalus hosackioides* (Royle ex Benth.) Benth., *Rhynchosia rothii* Benth. ex Aitch., *Sophora mollis* (Royle) Baker subsp. *griffithii* Stocks, *Trifolium tomentosum* L., and *Uraria picta* (Jacq.) Desv. ex DC. have been reported from the remote localities of Garhwal Himalaya.

1784. **Ghildiyal, J.C. 1984.** "Some important grasses of Rishikesh, U.P.". *J. UP Govt. College Acad. Soc.* 1(1): 32–35.

1785. **Ghildyal, N. 1985.** "*Carex desponsa* Boott (Cyperaceae)– A new record for North Western Himalaya". *J. Econ. Taxon. Bot.* 6(2): 431–432.

Abstract: *Carex desponsa* Boott has been recorded for the first time for North-Western Himalaya from Nainital, Kumaon. Earlier this species was reported from Eastern Himalaya.

1786. **Ghildyal, N. & Malhotra, C.L. 1985.** "*Carex winterbottomii* Clarke (Cyperaceae)– An overlooked Himalayan species". *J. Econ. Taxon. Bot.* 7(3): 559–560.

Abstract: *Carex winterbottomii* Clarke has been rediscovered after a gap of over 14 decades from Madhkot amongst the unidentified materials in BSD herbarium.

1787. **Ghildyal, N., Bhattacharyya, U.C. & Hajra, P.K. 1986.** "*Carex nandadeviensis* Ghildyal, Bhattacharyya et Hajra, a new species of Cyperaceae from Garhwal Himalaya". *Indian J. Forest.* 9(1): 90–92.

Abstract: A new species of Cyperaceae namely, *Carex nandadeviensis* Ghildyal, Bhattacharyya et Hajra allied to *C. setosa* Boott has been described and illustrated for Garhwal Himalaya from Bhojgara-Ramni, nanda Devi National Park, Chamoli district.

1788. **Ghora, C. & Panigrahi, G. 1985.** "Three new taxa *in Prunus cornuta* (Wall. ex Royle) Steudel complex (Rosaceae-Prunoideae) in India". *J. Econ. Taxon. Bot.* 7(1): 227–232.

Abstract: Three new taxa segregated from within *Prunus cornuta* (Wall. ex Rotle) Steudel are described: *P. cornuta* var. *integrifolia*, var. nov., *P. glauciphylla,* sp. nov. and *P. wattii,* sp. nov. Illustrations involving the diagnostic characters of the three new taxa, together with a key are provided and specimens held in CAL are cited.

1789. **Ghosh, R.B. 1980.** "*Primula hookeri* Watt– A new record from N.W. Himalaya". *Geobios* 7: 174–176.

Abstract: *Primula hookeri* Watt has been recorded for the first time for N.W. Himalaya from Hartoli Bugyals, Kumaon district. The present finding of the taxon from the region of N.W. Himalaya records its extended distribution range from E. Himalayas to N.W. Himalayas suggesting thereby phytogeographic affinity.

1790. **Gibbons, M., Spanner, T.W. & Kholia, B.S. 2008.** "*Trachycarpus takil* Becc. in Kumaun". *Curr. Sci.* 94: 444–446.

1791. **Goel, A.K. 1983.** "Three rare and threatened orchids from Garhwal Himalayas". *Geobios, New Rep.* 2: 143–144.

Abstract: Three rare and threatened orchids, viz., *Aphyllorchis gollani* Duthie, *Neottia microglottis* (Duthie) Beauv. and *Gastrodia orobanchioides* (Falc.) Benth. has been recorded from Garhwal Himalayas after a gap of over 80 years or more.

1792. **Goel, A.K. 1985.** "Nomenclature and distribution of *Juncus albescens* Satake (Juncaceae)". *J. Econ. Taxon. Bot.* 7(1): 208–209.

Abstract: A new name *Juncus yoskisukei* has been attributed to *Juncus albescens* Satake and is being reported for the first time in India from Garhwal, Kumaon and Sikkim Himalaya.

1793. **Goel, A.K. & Bhattacharyya, U.C. 1982.** "Rediscovery of three rarely collected plants from North-western Himalaya". *Indian J. Forest.* 5(1): 17–20.

Abstract: The present communication deals with three plants, viz., *Galium cryptanthum* Hemsley (Rubiaceae), *Ajuga brachystemon* Maxim. (Lamiaceae) and *Saccolabium distichum* Lindl. (Orchidaceae) collected more than 50 years from Himachal Pradesh & Uttar Pradesh, North-Western Himalaya.

1794. **Goel, A.K. & Bhattacharyya, U.C. 1985.** "*Pimpinella diversifolia* DC. var. *sarmentifera* Goel et Bhattacharyya (Apiaceae) - A new variety from Garhwal Himalaya". *J. Econ. Taxon. Bot.* 6(1): 213–215.

Abstract: A new variety *Pimpinella diversifolia* DC. var. *sarmentifera* Goel et Bhattacharyya (Apiaceae) has been described from Gangi, Tehri Garhwal Himalaya.

1795. **Goel, A.K. & Bhattacharyya, U.C. 1986.** "Additions of Primulaceae to the Indian flora from Tehri Garhwal". *Indian J. Forest.* 9(2): 97–99.

Abstract: The present communication deals with two taxa of family Primulaceae namely *Anagallis minima* (L.) E.H.L. Krause and *A. pumila* Swartz var. *ovalis* (Ruiz. & Pav.) R. Kunth which have been recorded for the first time from the Indian subcontinent in Tehri district.

1796. **Goel, A.K. & Mehrotra, B.N. 1985.** "Occurrence of *Luzula plumosa* E. Mey. (Juncacee) in the Garhwal Himalaya". *J. Econ Taxon. Bot.* 6: 439–441.

Abstract: *Luzula plumosa* E. Mey. (Juncacee) is being reported for the first time in the Garhwal Himalaya from Govanmanda (Tehri dist.) and Sonprayag (Chamoli dist.).This species is so far known only from Kumaon eastwards to Khasia and Jaintia hills, Meghalaya.

1797. **Gornall, R.J., Rawat, D.S. & Zhang, Z. 2012.** "*Saxifraga minutissima,* a new species from the Garhwal Himalaya, and its implications for the taxonomy of the genus *Saxifraga* (Saxifragaceae)". *Edinburgh J. Bot.* 69(2): 211–217.

Abstract: *axifraga minutissima* D.S. Rawat, a new and extremely small species of *Saxifraga* (Saxifragaceae), is described from the Garhwal Himalaya, India. It differs from all other species of *Saxifraga*, except *Saxifraga bicuspidata*, in having five stamens and lacking petals. It can be distinguished from *Saxifraga bicuspidata* in having leaves and sepals entire. The finely striate pollen exine pattern of *Saxifraga minutissima* indicates that the species belongs to *Saxifraga* section *Ciliatae*. Its prostrate, axillary leafy shoots and lack of crisped, rufous hairs strongly suggests a place in *Saxifraga* subsection *Serpyllifoliae*, where one of its closest relatives may be *Saxifraga stella-aurea.*

1798. **Gupta, A.K. & Murty, Y.S. 1986.** "New plant records for Upper Gangetic Plain". *Indian J. Forest.* 9(3): 281–282.

Abstract: Seven species viz., *Lepidium ruderale* Linn., *Astragalus prolixus* Sieber, *Lotus corniculatus* var. *minor* Baker, *Merremia quinquefolia* Hall.f., *Lycopus europaeus* Linn., *Alternanthera philoxeroides* Ginseb. and *Eleocharis capitata* R. Br. are reported as new records for the Upper Gangetic Plain from Ghaziabad district.

1799. **Hajra, P.K. 1983a.** "A new species of *Listera* from Nanda Devi National Park, Chamoli district, Uttar Pradesh". *Bull. Bot. Surv. India* 25(1-4): 181–182.

Abstract: A new species of *Listera* viz., *L. nandadeviensis* allied to *L. nepalensis* Balak. has been described and illustrated from Himtoli, Nanda Devi National Park, Chamoli district, Uttar Pradesh.

1800. **Hajra P.K. 1983b.** "A new species of *Saussurea* from Nanda Devi National Park, Chamoli district, Uttar Pradesh". *Indian Forester* 109(2): 77–79.

Abstract: A new species of *Saussurea* viz., *S. sudhanshui* allied to *S. subulata* Clarke (in part) has been described and illustrated from Nanda Devi National Park, Chamoli district, Uttar Pradesh.

1801. **Hajra, P.K. 1983c.** "A new species of *Festuca* (Poaceae) from Nanda Devi National Park, Chamoli district, Uttar Pradesh". *Indian J. Forest.* 6(1): 79–80.

Abstract: A new species of *Festuca* viz., *F. nandadevica* allied to *F. leptopogon* has been described and illustrated from Deodi-Ramani, Nanda Devi National Park, Chamoli, Uttar Pradesh.

1802. **Hajra, P.K. 1984.** "Leopard orchid from Pithoragarh distict, Uttar Pradesh". *Indian Forester* 110(7): 686–687.

Abstract: Leopard orchid, *Bulbophyllum leopardinum* (Wall.) Lindl. ex Wall. has been collected on the branches of *Myrica esculenta* from Pithoragarh distict, Uttar Pradesh. This species was earlier known from Nepal, Sikkim, Arunachal Pradesh and Meghalaya.

1803. **Hajra, P.K. & Daniel, P. 1984.** "*Listera tenuis* Lindl.– A rare and interesting orchid from the north western Himalaya". *Bull. Bot. Surv. India* 26(3-4): 204–207.

Abstract: *Listera tenuis* Lindl., so far known from Sikkim Himalaya, Nepal and Chumbi valley (Tibet) has been reported here for the first time for the north western Himalaya from Deodi to Ramani camp, Nanda Devi National Park, Chamoli district of Uttar Pradesh.

1804. **Hajra, P.K. & Dixit, R.D. 1984.** "*Woodsia cycloloba* Hand.-Mazz. (Woodsiaceae)– A rare fern from Nanda Devi National Park, Chamoli district, Uttar Pradesh". *Bull. Bot. Surv. India* 26(3-4): 202.

Abstract: A rare fern *Woodsia cycloloba* Hand.-Mazz. (Woodsiaceae) has been reported for the first time for Uttar Pradesh from Nanda Devi National Park, Chamoli district. This species was originally described from China (Yunnan) and has been reported from Sikkim and Nepal.

1805. **Hajra, P.K. & Kothari, M.J. 1983.** "On the occurrence of *Acampe rigida* (Buch.-Ham. ex Smith) P.F. Hunt and *Vandopsis undulata* (Lindl.) Smith (Orchidaceae) in Pithoragarh district, Uttar Pradesh". *Indian J. Forest.* 6(2): 160–161.

Abstract: *Acampe rigida* (Buch.-Ham. ex Smith) P.F. Hunt and *Vandopsis undulata* (Lindl.) Smith (Orchidaceae) in Pithoragarh district, Uttar Pradesh has been reported from Jauljibi-Baram road, Pithoragarh district of Uttar Pradesh. The species *Acampe rigida* earlier known from Nepal, Sikkim, Arunachal Pradesh, Thailand and Malay Paninsula and *Vandopsis undulata* from Nepal, Bhutan, Sikkim and Meghalaya.

1806. **Husain, T. & Agnihotri, P. 2009.** "*Berberis glaucocarpa* Stapf. (Berberidaceae) reported for the first time from Nainital hills of Kumaon Himalaya". *Fl. & Fauna* 15(2): 357–358.

1807. **Husain, S.I. & Kapoor, S.L. 1971.** "Some interesting plants from Lucknow and its neighbourhood". *J. Bombay Nat. Hist. Soc.* 67(3): 618–620.

Abstract: Twelve interesting plants viz., *Acanthospermum australe* (Linn.) O. Kuntze, *Ambrosia artemisifolia* Linn., *Dichrocephala latifolia* DC., *Glossosyne bidens* (Retz.) Alst. (Asteraceae), *Amaranthus hybridus* Linn. subsp. *cruentus* (L.) Thell. var. *paniculatus* (L.) Thell. (Amaranthaceae), *Atylosia platycarpa* Benth., *Trifolium alexandrinum* Linn. (Fabaceae), *Centaurium roxburghii* (G. Don) Druce (Gentianaceae), *Clerodendrum inerme* Gaertn. (Verbenaceae), *Leucas urticaefolia* R. Br. (Labiatae), *Lindernia anagallis* (Burm.) Penn. (Scrophulariaceae) and *Swietenia mahagoni* Jacq. (Meliaceae) have been reported from Lucknow and its surrounding areas.

1808. **Hussain, W. 1967.** "Some new records for plants in the Upper Gangetic Plain". *Indian Forester* 93(8): 582–585.

Abstract: Seven species of plants viz., *Cerastium glomeratum* Thuill. (Caryophyllaceae), *Oenanthe benghalensis* Benth. (Apiaceae), *Wedelia chinensis* (Osbeck) Merr., *Elephantopus spicatus* Aubl., *Mikania cordata* (Burm.f.) Robinson (Asteraceae) and *Limnophila chinensis* (Osbeck) Merr., *Lindernia hyssopioides* (Benth.) Haines (Scrophulariaceae) have been recorted for the first time for Upper Gangetic Plain from Aligarh.

1809. **Issar, R.K. 1966.** "A note on the occurrence of *Gleadovia ruborum*– A rare Himalayan genus". *Indian Forester* 92(2): 132.

Abstract: Earlier *Gleadovia ruborum* Gamble & Prain (Orobanchaceae) has been reported from Jaunsar (1989), Deoban (1900) and Balate valley, East Almora Division (1951). Recently this species was reported from Yamuna Forest Division, Hardwar in 1964. A detailed description along with distribution has been given in this paper.

1810. **Jaffer, R. & Gupta, B.K. 1982.** "New or little known aromatic grass from Kotdwara Siwalik". *Indian J. Forest.* 5(4): 329.

Abstract: New or little known aromatic grass *Bothriochloa bladhii* (Retz.) S.T. Blake has been recorded from Siwalik foot-hills at Chandi Devi near Haridwar (U.P.) and forms the first record of its occurrence from Kotdwara Siwalik.

1811. **Jalal, J.S. 2012a.** "*Androcorys pugioniformis* (Lindl. ex Hook.f.) K.Y. Lang (Orchidaceae): New distributional record from Garhwal Himalaya, Western Himalaya, India". *Check List* 8(3): 595–596.

Abstract: *Androcorys pugioniformis* (Lindl. ex Hook.f.) K.Y. Lang is a critically endangered terrestrial herb distributed along the Indian Subcontinent. Here we provide a new record of this rare species from Garwal Himalaya, India. After a gap of about a century this species is rediscovered from Ralam valley of Pithoragarh district. This species is assessed as Critically Endangered by IUCN.

1812. **Jalal, J.S. 2012b.** "The Snow Orchid [*Diplomeris hirsuta* (Lindl.) Lindl.] is in distress in the Western Himalaya of India". *McAllen Int. Orchid Soc. J.* 13(6): 11–15.

1813. **Jalal, J.S. & Pangtey, Y.P.S. 2011a.** "*Gastrodia falconeri* recollected from Western Himalaya, India". *Richardiana* 11(2): 53–60.

Abstract: *Gastrodia falconeri* D.L. Jones & M.A. Clements has been recollected from Kumaon after a gap of 100 years. It was originally collected and reported by Nainital by S.W. Seers without date and year of collection. Detailed diagnostic characters, description and illustration are given in the present paper along with habitat study and assessment of threat.

1814. **Jalal, J.S. & Pangtey, Y.P.S. 2011b.** "Rediscovery of *Vanda alpina,* a rare epiphytic orchid in Western Himalaya, India". *Richardiana* 11(4): 173–178.

Abstract: *Vanda alpina* (Lindley) Lindley was rediscovered in the Western Himalaya from Dunapani, Pithoragarh district after a gap of 105 years. The present paper gives a brief description with an illustration and discusses the present status of this species.

1815. **Jalal, J.S., Kumar, P. & Rawat, G.S. 2012.** "*Nervilia pangteyana* sp. nov., a terrestrial orchid from western Himalaya, India". *Nordic J. Bot.* 30: 407–411.

Abstract: *Nervilia pangteyana* J.S. Jalal, Kumar & G.S. Rawat (Orchidaceae), a new species from western Himalaya (Uttarakhand), India is described, illustrated and compared with its closest relative. In addition, a key is given to distinguish between species of *Nervilia* in the western Himalayas.

1816. **Jalal, J.S., Rawat, G.S. & Pangtey, Y.P.S. 2006a.** "A note on the identity of *Bulbophyllum secundum* Hook.f. (Orchidaceae) in the orchid flora of Uttaranchal". *J. Econ. Taxon. Bot.* 30(2): 211–212.

Abstract: The present paper confirms the occurrence of *Bulbophyllum secundum* Hook.f. in Uttaranchal from Kumaun Himalaya.

1817. **Jalal, J.S., Rawat, G.S. & Pangtey, Y.P.S. 2006b.** "*Peristylus affinis* (D. Don) Seidenf. (Orchidaceae): A new record for Kumaun Himalaya (Uttaranchal)". *J. Econ. Taxon. Bot.* 30(2): 401–402.

Abstract: Present paper deals with the collection of *Peristylus affinis* (D. Don) Seidenf. From Kumaun Himalaya after a long gap of one hundred years from Uttaranchal.

1818. **Jalal, J.S., Rawat, G.S. & Pangtey, Y.P.S. 2006c.** "Recollection of *Eulophia hormusjii* Duthie (Orchidaceae) from the foot-hills of the Kumaun Himalaya". *J. Econ. Taxon. Bot.* 30(2): 424–426.

Abstract: The present paper deals with recollection of an orchid *Eulophia hormusjii* Duthie after a century from Uttaranchal.

1819. **Jalal, J.S., Rawat, G.S. & Pangtey, Y.P.S. 2007a.** "Rediscovery of a rare orchid, *Androcorys pugioniformis* (Lindl. ex Hook. f.) K.Y. Lang., Orchidaceae in Uttarakhand from Kumaon hills". *Indian J. Forest.* 30(3): 337–338.

Abstract: *Androcorys pugioniformis* (Lindl. ex Hook. f.) K.Y Lang. has been rediscovered after a gap of about one century from Ralam valley, Pithoragarh district in Eastern Uttarakhand, earlier reported from Srikanta near Dudhu glacier (Bhagirathi valley in Uttarkashi district between 4200-4500 m. It also forms a new record for Kumaon Himalaya.

1820. **Jalal, J.S., Rawat, G.S. & Pangtey, Y.P.S. 2007b.** "A note on the occurrence of *Ornithochilus difformis* (Wall. ex Lindl.) Schltr. in Kumaon Himalaya". *Indian J. Forest.* 30(4): 523–524.

Abstract: *Ornithochilus difformis* (Wall. ex Lindl.) Schltr. has been reported for the first time for Nainital and reported as an addition to the orchid flora of Nainital.

1821. **Jalal, J.S., Rawat, G.S. & Pangtey, Y.P.S. 2008a.** "*Ponerorchis nana* (King & Pantling) Soo (Orchidaceae)– A new record from Uttarakhand". *J. Bombay Nat. Hist. Soc.* 104(2): 249–250.

Abstract: *Ponerorchis nana* (King & Pantling) Soo has been recorded for the first time for the flora of Uttarakhand from Chuli Bugyal of Uttarkashi district, Garhwal Himalaya. Earlier this species was reported from Himachal Pradesh and Sikkim.

1822. **Jalal, J.S., Rawat, G.S. & Pangtey, Y.P.S. 2008b.** "Note on the occurrence of *Listera tenuis* Lindl. (Orchidaceae) in Kumaon Himalaya". *J. Bombay Nat. Hist. Soc.* 104(2): 250.

Abstract: *Listera tenuis* Lindl. has been recorded for the first time for Kumaon Himalaya from upper Gori valley, Pithoragarh district.

1823. **Jalal, J.S., Tewari, L.M. & Pangtey, Y.P.S. 2009a.** "*Pholidata articulata* Lindl., an orchid used in bone jointing in Kumaun region, Western Himalaya". *Ethnobot. Leafl.* 13: 1047–1050.

Abstract: *Pholidata articulata* Lindl., known locally as 'Harjojan' or bone jointer, is distributed commonly in moist ravines and river valleys up to 1600 m in the Kumaun Himalaya. It is an epiphytic or lithophytic plant. The whole plant is used in traditional medicine.

1824. **Jalal, J.S., Tewari, L.M. & Pangtey, Y.P.S. 2009b.** "*Nervilia gammieana* (Hook.f.) Pfitzer (Orchidaceae)– A new record for Kumaun Himalaya, India". *J. Amererican Sci.* 5(3) 91–94.

Abstract: Kumaun Himalayas are placed in the central sector of the Indian Himalayas and lies between 28°44'- 30°49' N Lat. and 78°45'- 81°01' E long. The orchid flora of the Kumaun Himalayas is well studied and explored by the several workers in the past. The present paper confirms the occurrence of *Nervilia gammieana* (Hook.f.) Pfitzer in the Kumaun Himalayas. In 2008, during the course of orchid explorations in Nainital district (as a part of the project sponsored by the Department of Science and Technology, Government of India), some orchids were collected from Nainital district. On critical examination of these specimens, they were identified as *Nervilia gammieana* (Hook.f.) Pfitzer. The present paper deals with the description and distribution of *Nervilia gammieana* (Hook.f.) Pfitzer from the Nainital region of Kumaun Himalayas.

1825. **Jalal, J.S., Kumar, P., Kotia, A. & Rawat, G.S. 2012.** "On the occurrence of *Pelatentheria insectifera* (Orchidaceae) in Jim Corbett National Park, India". *Richardiana* 12(3): 108–115.

Abstract: *Pelatantheria insectifera* (Reichenbach f.) Ridley (Orchidaceae) was rediscovered in the Jim Corbett National Park area in Western Himalaya (India) after a gap of more than 100 years. The present paper deals with its description, distribution and ecology.

1826. **Jalal, J.S., Kumar, P., Rawat, G.S. & Pangtey, Y.P.S. 2009.** "*Habenaria pubescens* Lindley: An interesting orchid from Western Himalaya". *Richardiana* 9(2): 76–84.

Abstract: *Habenaria pubescens* Lindley has been reported from only two localities in the world, Garhwal Himalaya (J.F. Duthie, 1906) and Nepal. In the current work, the species is recorded for the first time from Chopara village, Nainital, Kumaun Himalaya.

1827. **Jalal, J.S., Kumar, P., Rawat, G.S. & Pangtey, Y.P.S. 2010a.** "*Bulbophyllum hirtum* (Sm.) Lindley (Orchidaceae)– New record from western Himalaya, India". *Indian J. Forest.* 33(3): 445–446.

Abstract: *Bulbophyllum hirtum* (Sm.) Lindley, so far known from the North-East part of India is being first time reported for Western Himalay from Pithoragarh district of Uttarakhand.

1828. **Jalal, J.S., Kumar, P., Rawat, G.S. & Pangtey, Y.P.S. 2010b.** "*Goodyera vittata* (Lindl.) Benth. ex Hook.f.: A new record of jewel orchid for Western Himalaya, India". *J. Non-Timber Forest Prod.* 17(3): 333–334.

Abstract: An interesting Jewel Orchid, *Goodyera vittata* Benth. ex Hook.f. is being reported for the first time for Western Himalaya from Bageshwar (on way to Pindari glacier), Uttarakhand. Brief description of the species along with illustration, phenology and notes on microhabitat has been provided.

1829. **Jalal, J.S., Rai, I.D., Kumar, P., Rawat, G.S. & Pangtey, Y.P.S. 2010.** "*Platanthera leptocaulon* (Hooker f.) Soo: An addition to the orchid flora of western Himalayas, India". *Richardiana* 10(2): 85–93.

Abstract: *Platanthera leptocaulon* (Hooker f.) Soo, an interesting ground orchid, is being reported here for the first time for the western Himalayas, India from Tunganath

and Bedini meadows in Chamoli district of Uttarakhand. This species was hitherto known to occur only in eastern Himalayas and Southeast China. For the ease of identification in the field a brief description and illustration are given.

1830. **Jana, B. 2012.** "A new species of *Kobresia* Willd. (Cyperaceae) from Western Himalaya". *Indian J. Fundamental & Appl. Life Sci.* 2(2): 256–260.

Abstract: A new species of *Kobresia* Willd. viz., *K. rcsrivastavae* allied to *K. woodii* Noltie and *K. cerostachys* (Frnch.) C.B. Clarke has been described and illustrated from Sarsaupathar, Nanda Devi National Park, Uttarakhand, Western Himalaya.

1831. **Janardhanan, K.P. & Prasad, R. 1971.** "*Ludwigia hyssopifolia* (G. Don) Exell.– A new record for the Upper Gangetic plain and Rajasthan". *Bull. Bot. Surv. India* 13(1&2): 160.

Abstract: The present report of *Ludwigia hyssopifolia* (G. Don) Exell. From Chitrakut (Uttar Pradesh) and Lohargal (Rajasthan) is its first record from Upper Gangetic Plain and Rajsthan respectively. Earlier this plant was reported from Bihar, Orissa, Assam, Nagaland, West Bengal, Tamil Nadu, Kerala and Maharashtra.

1832. **Joshi, A.P. & Agrawal, A.K. 1984.** "A new report of a grass for Garhwal (valley between Khoh and Ganga)". *Indian J. Forest.* 7(3): 245.

Abstract: *Themeda strigosa* (Ham. ex Hook.f.) A. Camus has been reported first time from Garhwal (valley between Khoh and Ganga).

1833. **Joshi, A.P. & Chandra, S. 1983.** "New distribution record of grasses from Garhwal". *J. Econ. Taxon. Bot.* 4: 313–314.

Abstract: Three grass species viz., *Chloris barbata* Sw., *Eragrostiella brachyphylla* (Stapf.) Bor and *Eragrostis ciliaris* (L.) R. Br. has been recorded for the first time for the flora of Garhwal.

1834. **Joshi, A.P., Agrawal, A.K., Chandra, S. & Gupta, S.K. 1984.** "Some new reports of Fabaceae from Khoh valley of outer Garhwal Himalayas". *J. Econ. Taxon. Bot.* 5(4): 839–840.

Abstract: *Atylosia scarabaeoides* (L.) Benth., *Crotalaria bialata* Schrank., *C. calycina* Schrank., *Desmodium motorium* (Houtt.) Merr. and *Flemingia macrophylla* (Willd.) Merr. have been recorded for the first time from Khoh valley of outer Garhwal Himalayas.

1835. **Joshi, B., Ansari, A.A. & Tiwari, A.P. 2014.** "*Crotalaria epunctata* Dalz. (Fabaceae)– A new angiospermic record for Uttar Pradesh". *Indian J. Forest.* 37(3): 359–360.

Abstract: *Crotalaria epunctata* Dalz. (Fabaceae), an endemic species known only from South India, Madhya Pradesh and Chhattisgarh is reported for the first time from Uttar Pradesh.

1836. **Joshi, D.N. 1978.** "*Trisetum scitulum* Bor - A new record for Western Himalaya". *Indian J. Forest.* 1(2): 165.

Abstract: *Trisetum scitulum* Bor has been recorded for the first time for Western Himalaya from Rudranath, Chamoli district.

1837. **Joshi, G.C., Tiwari, R.N. & Uniyal, M.R. (1991) 1992.** "Records of plants after a century from western Himalaya– *Wallichia densiflora* Mart. and *Phrynium placentarum* (Lour.) Merr.". *J. Econ. Taxon. Bot.* 15(3): 719–720.

Abstract: Two interesting plants viz., *Wallichia densiflora* Mart. and *Phrynium placentarum* (Lour.) Merr. has been collected after a gap of a century from Kalagarh forest division of district Pauri, U.P.

1838. **Joshi, S.K. & Gairola, S. 2003.** "*Cuscuta europaea* Linn. (Dodder plant): An emerging threat to plant diversity of Valley of Flowers". *Curr. Sci.* 84(10): 1285–1286.

1839. **Joshi, Y., Tripathi, M. & Upreti, D.K. 2013.** "First report of *Hyperphyscia adglutinata* var. *pyrithrocardia* Mull.Arg. (Physciaceae) from Himalaya". *Phytotaxonomy* 13: 166.

Abstract: *Hyperphyscia adglutinata* var. *pyrithrocardia* Mull.Arg., is reported for the first time for Himalayan lichen flora for India from Chaubatiya garden, Ranikhet (western Himalayan range). Previously the species was reported from Palni hills, Tamil Nadu.

1840. **Joshi, Y., Bisht, K., Upadhyay, Shashi & Chandra, K. 2018.** "Three new records of lichens from India". *Nelumbo* 60(1): 90–94.

Abstract: Three lichen species, viz., *Clauzadea immersa, Crocynia gossypina* and *Dermatocarpon reticulatum* are reported new to Indian lichen flora from Himachal Pradesh, Kerala and Uttarakhand, respectively. All the species are appended here with diagnostic characteristics, ecology and the details of specimens examined.

1841. **Juyal, N. & Bhattacharyya, U.C. 1983.** "On a recollection of seven rare Carices from North-Western Himalaya". *J. Econ. Taxon. Bot.* 4: 298–302.

Abstract: Notes are given for five species of *Carex* viz., *C. fusiformis* Nees, *C. lehmannii* Drejer, *C. supina* Wahl., *C. tristis* Bieb., *C. microglochin* Wahl. and two varieties *C. myosurus* Nees var. *praetans* (Clarke) Kukenth. and *C. myosusrus* Nees var. *eminens* Boeck. which have been recollected after many decades.

1842. **Juyal, N. & Bhattacharyya, U.C. 1986.** "Four species of *Carex* L. (Cyperaceae): New for North Western Himalaya". *Indian J. Forest.* 9(3): 279–280.

Abstract: Four species of *Carex* L. viz., *C. capillacea* Boott, *C. continua* Clarke, *C. doniana* Spreng. and *C. munda* Broott not recorded so far from North Western Himalaya, which are reported here as a new plant records for this area.

1843. **Juyal, N. & Goel, A.K. 1982.** "Some rarely known sedges from N.W. Himalaya". *J. Econ. Taxon. Bot.* 3: 313–314.

Abstract: The present communication deals with four rarely known sedges from N.W. Himalaya viz., *Carex atrata* L. subsp. *pullata* (Boott) Kukenthal and *Microschoenus duthiei* C.B. Clarke from Garhwal, *C. kumaonensis* Kukenthal from Kumaon and *C. stracheyi* C.B. Clarke from Kumaon and Garhwal.

1844. **Kalakoti, B.S. & Pangtey, Y.P.S. 1982a.** "*Breynia rhamnoides* (Willd.) Muell.-Arg. reported from the foot hills of Nainital". *Indian J. Forest.* 5(2): 161.

Abstract: *Breynia rhamnoides* (Willd.) Muell.-Arg. has been reported for the first time from Kumaon area from the foot hills of Nainital. So far this species has been reported from Tropical India from Oudh to Assam extending to Trivandrum and Sri Lanka, Burma, Nepal, China, Malaya and the Philippines.

1845. **Kalakoti, B.S. & Pangtey, Y.P.S. 1982b.** "*Crassocephalum crepidioides* (Benth.) S. Moore– A new record for Kumaun Himalaya". *Indian J. Forest.* 5(4): 324.

Abstract: *Crassocephalum crepidioides* (Benth.) S. Moore has been freported for the first time for Kumaun Himalaya from Jeolikote, Bageshwar, Didihat and Baram in Gori valley. Previously this species was reported from Assam, West Bengal, Madhya Pradesh, Orissa, Karnataka and Dehra Dun.

1846. **Kalakoti, B.S. & Pangtey, Y.P.S. 1983.** "Additions to the flora of Nainital". *J. Econ. Taxon. Bot.* 4: 193–195.

Abstract: Twenty species of flowering plants have been reported as additions to the Flora of Nainital in this communication.

1847. **Kalakoti, B.S. & Pangtey, Y.P.S. 1984.** "Additions to the flora of Nainital- II". *J. Econ. Taxon. Bot.* 5(3): 663–667.

Abstract: Thirty five more species of flowering plants have been reported as additions to the flora of Nainital in this paper.

1848. **Kalakoti, B.S., Pangtey, Y.P.S. & Rawat, G.S. 1983.** "*Oxalis tetraphylla* Cav.– A new record for North-Western Himalaya". *Indian J. Forest.* 6(2): 168.

Abstract: *Oxalis tetraphylla* Cav. has been reported for the first time for North-Western Himalaya from Ranikhet and Nainital, Kumaon. Earlier this species was reported from Shillong, Nilgi Hills and Palni Hills.

1849. **Kalakoti, B.S., Rawat, G.S. & Pangtey, Y.P.S. 1985.** "Some recently introduced or newly recorded plants from Kumaun hills". *Indian Forester* 111(3): 164–166.

Abstract: The present paper describes 13 recently introduced plants which have become naturalised in various parts of Kumaun. These plants have not been reported earlier from this region.

1850. **Kandwal, M.K. & Gupta, B.K. 2005a.** "*Cyathopus sikkimensis* Stapf (Poaceae) in North West Himalaya". *Bull. Bot. Surv. India* 47(1-4): 169–172.

Abstract: *Cyathopus sikkimensis* Stapf has been recorded for the first time for North West Himalaya from Munsyari, Pithoragarh district. Earlier this species is reported from Sikkim and eastern Bhutan region of Eastern Himalaya.

1851. **Kandwal, M.K. & Gupta, B.K. 2005b.** "*Calamagrostis nagarum* (Bor) G. Singh (Poaceae)– Rediscovery of a rare and endemic species". *Indian J. Forest.* 28(1): 83–84.

Abstract: *Calamagrostis nagarum* (Bor) G. Singh a rare and endemic species of Naga Hills (North-east India) that had never been collected earlier after its type, has now been rediscovered from Bhagwanpur, near Dhakuri in Bageshwar district, Uttaranchal Himalaya.

1852. **Kandwal, M.K. & Gupta, B.K. 2005c.** "*Sporobolus africanus* (Poir.) Robyns et Tourn. (Poaceae)– A new record for India". *Indian J. Forest.* 28(3): 319–320.

Abstract: *Sporobolus africanus* (Poir.) Robyns et Tourn. has been recorded for the first time for India on the way from Munsyari to Madkot, Pithoragarh district, Uttaranchal.

1853. **Kandwal, M.K. & Gupta, B.K. 2006a.** "A note on the occurrence of *Zoysia pacifica* (Gouds.) Hotta & Kukori in Uttaranchal". *Ann. Forest.* 14(1): 92–94.

Abstract: *Zoysia pacifica* (Gouds.) Hotta & Kukori has been reported for the first time for Uttaranchal from Almora. This is the first record of occurring/growing in the lawn as far North as Almora and Dehra Dun in North West India.

1854. **Kandwal, M.K. & Gupta, B.K. 2006b.** "New distributional records of some grasses from North West Himalaya". *Indian J. Forest.* 29(2): 201–202.

Abstract: Some interesting specimens belonging to the family Poaceae, viz., *Eragrostis papposa* (Roem. & Schult.) Steud., *Oropetium roxburghianum* (Steud.) S.M. Philips, *Festuca polycolea* Stapf var. *Brevis* Stapf and *Arundinella setose* Trin., collected from different localities in Uttaranchal are recorded for the first time in North-West Himalaya. These are described below for their easy identification.

1855. **Kandwal, M.K. & Gupta, B.K. 2006c.** "A note on *Pennisetum clandestinum* Hochst. ex Chiov.". *J. Econ. Taxon. Bot.* 30(2): 207–209.

Abstract: *Pennisetum clandestinum* Hochst. ex Chiov., a valuable fodder grass introduced from Africa is found naturalised in the forests of Uttaranchal.

1856. **Kandwal, M.K. & Gupta, B.K. 2006d.** "*Calamagrostis nagarum* (Bor) G. Singh (Poaceae) rediscovery of an endemic taxon". *J. Econ. Taxon. Bot.* 30(2): 274–276.

Abstract: *Calamagrostis nagarum* (Bor) G. Singh, a rare and endemic taxa of Naga Hills (North-East India) never been collected after its type, is rediscovered from Bhagwanpur near Dhakuri in Bageshwar district of Uttaranchal Himalaya.

1857. **Kandwal, M.K. & Gupta, B.K. 2006e.** "A note on the occurrence of Genus *Arrhenatherum* P. Beauv in West Himalaya". *Phytotaxonomy* 6: 133–134.

Abstract: *Arrhenatherum* P. Beauv., a common grass (Poaceae), of Europe, Mediterranean region and western Asia is of rare occurrence in India, is being recorded for the first time from Uttranchal in West Himalaya.

1858. **Kandwal, M.K. & Gupta, B.K. 2009.** "A new variety of *Microstegium vimineum* (Trin.) A. Camus from Uttarakhand (India)". *Indian J. Forest.* 32(1): 171–173.

Abstract: A new variety of *Microstegium vimineum* (Trin.) A. Camus viz., *M. vimineum* var. *loharkhetianum* has been described from Bageshwar district in Uttarakhand along with its illustration.

1859. **Kandwal, M.K. & Gupta, B.K. 2010.** "A note on the occurrence of *Agrostis triaristata* (Poaceae: Tribe Agrostideae) in western Himalaya". *Ann. Forest.* 18(1): 78–80.

Abstract: *Agrostis triaristata* (Hook.f.) Bor (Poaceae) is reported as new record for the flora of the Western Himalaya near Parvati Kund (Lake), Pithoragarh district of Uttarakhand. The details of description and illustration of the species is provided here.

1860. **Kandwal, M.K., Gupta, B.K. & Srivastava, S.K. 2007.** "A new species of *Eulalia* (Poaceae) from India". *Kew Bull.* 62(3): 519–521.

Abstract: A new species of *Eulalia* Kunth, *E. madkotiensis* Manish K. Kandwal, B. K. Gupta & S. K. Srivast., is described and illustrated from the Gori valley in Pithoragarh district of Uttaranchal, India. The species is closely allied to *E. slaintonii* Bor.

1861. **Kandwal, M.K., Pal, R. & Gupta, B.K. 2003.** "*Poa arnoldii* Melderis– A new record from India". *Indian J. Forest.* 26(3): 327–329.

Abstract: *Poa arnoldii* Melderis, endemic to Nepal has been recorded for the first time for India from Kedar Tal (Gangotri), Uttarkashi district, Uttaranchal.

1862. **Kandwal, M.K., Pal, R., Uniyal, B.P. & Gupta, B.K. 2003.** "Some additions to the grasses of Uttaranchal state". *Indian J. Forest.* 26(4): 434–437.

Abstract: In the present paper eight species grasses has been recorded first time for Uttarachal state as well as erstwhile state of Uttar Pradesh.

1863. **Kant, R., Kharkwal, K., Sinha, B.K. & Ambrish, K. 2018.** "*Humulus lupulus* L. (Cannabaceae): A new record for Uttarakhand". *J. Non-Timber Forest Prod.* 25(4): 243–244.

Abstract: *Humulus lupulus* L. (Cannabaceae), an economic plant species, so far reported from Himachal Pradesh and Jammu & Kashmir, in India is now being reported for the first time from the Valley of Flowers National Park as a new distributional record for Uttarakhand. Detailed description and photoplate of the taxon are provided for identification in the field.

1864. **Kapoor, S.L. & Kapoor, L.D. 1970.** "A note on the occurrence of *Asparagus acerosus* Roxb. (Liliaceae) in the region of Upper Gangetic Plain and Assam". *Bull. Bot. Surv. India* 12(1-4): 273.

Abstract: *Asparagus acerosus* Roxb. was reported by Raizada from Bankatwa, Bahraich district. Recently this species was reported from 2.5 km east of Tehri Ghat, Gorakhpur district with a detailed description along with field notes. Some of the salient features supplementing the available description in general are also included.

1865. **Kapoor, S.L. & Srivastava, G.S. 1960.** "*Cleome monophylla* Linn. Anew record from Upper Gangetic Plain". *Sci. & Cult.* 26: 352.

1866. **Kaur, J. & Narain, S. 2018.** "*Ipomoea littoralis* and *Ipomoea capitellata* var. *multilobata*: New records for Upper Gangetic Plains of India". *Fl. & Fauna* 24(1): 3–7.

Abstract: The floristic exploration and critical examination of specimens collected of family Convolvulaceae from Upper Gangetic Plain of India, resulted in addition of 2 new records for the flora viz., *Ipomoea littoralis* Blume and *Ipomoea capitellata* Choisy var. *multilobata* Bhellum. Detailed description, phenology, ecology, distribution, locality, field number, type specimens examined, illustrations and other relevant notes are provided.

1867. **Kaur, J., Singh, K. & Narain, S. 2018.** "Additions to the flora of Banda district Uttar Pradesh". *Fl. & Fauna* 24(2): 275–279.

Abstract: Three species of angiosperm belonging to two families have been recorded in Banda district, which are new additions to the flora of Banda viz., *Flueggea virosa* (Roxb. ex Willd.) Royle, *Prosopis cineraria* (L.) Druce and *Albizia amara* (Roxb.) Bovin.

1868. **Kaur, J., Narain, S. & Kumar, S. 2018.** "Novelties in Convolvulaceae to the flora of Allahabad district, Uttar Pradesh, India". *Bionature* 38(4): 259–265.

Abstract: Floristic exploration for the family Convolvulaceae in Upper Gangetic Plains of India resulted in the addition of five species (*Cuscuta campestris* Yunck., *Ipomoea quamoclit* L., *Ipomoea triloba* L., *Ipomoea capitellata* Choisy var. *multilobata* Bhellum and *Ipomoea laxiflora* Chowdhery and Debta) to the flora of Allahabad district. The details including photographs, scientific names, vernacular names, distinguishing

characters, associated plants, phenology, habitat, locality of collection, field number are mentioned in the present paper.

1869. **Kaur, S. & Punetha, N. 1984a.** "*Arthromeris lungtauensis* Ching: A new record for India". *J. Bombay Nat. Hist. Soc.* 81(3): 737–739.

Abstract: *Arthromeris lungtauensis* Ching, earlier known from China and Darjeeling in India has been recorded for the first time for Kumaon Himalaya from Pithoragarh district.

1870. **Kaur, S. & Punetha, N. 1984b.** "Some new records of frens from Kumaun Himalaya". *New Botanist* 12(2-4): 166–168.

1871. **Kazmi, S.M.A. 1975.** "*Ivanjohnstonia jaunsarensis*– A new genus and species of Boraginaceae from North-west Himalayas". *Sultania* 1: 1–4.

1872. **Khan, A.A., Agrawal, S. & Khan, A. 2006.** "*Hypericum japonicum* Thunb. ex Murr.– A new record for Uttar Pradesh from Hastinapur Wildlife Sanctuary". *J. Econ. Taxon. Bot.* 30(3): 697–698.

Abstract: Present communication on occurrence of *Hypericum japonicum* Thunb. ex Murr. In Hastinapur Wildlife Sanctuary is a new record for present territory of Uttar Pradesh state and also from lowest altitude recorded so far.

1873. **Khanna, K.K. & Kumar, A. 2000.** "Extended distribution of an endemic plant– *Ficus cupulata* Haines". *J. Econ. Taxon. Bot.* 33(4): 832–833.

Abstract: *Ficus cupulata* Haines, an endemic plant in Madhya Pradesh, has been reported as a new record for Uttar Pradesh from Orcha forest division, Jhansi district, it is an extended distribution from the type locality.

1874. **Khanna, K.K. & Shukla, A.N. 2017.** "*Eclipta prostrata* (L.) L. var. *dixitii* Anand Kumar & K.K. Khanna– A new distributional record for Uttar Pradesh". *Phytotaxonomy* 17: 128.

Abstract: *Eclipta prostrata* (L.) L. var. *dixitii* Anand Kumar & K.K. Khanna has been reported as a new distributional record for the flora of Uttar Pradesh from Parvati Arga area, Gonda district.

1875. **Khanna, K.K. & Shukla, A.N. 2019.** "Some angiosperms as new record for Uttar Pradesh, India". *J. New Biol. Rep.* 8(1): 22–26.

Abstract: The paper deals with an account of eleven species of angiosperms viz., *Coelachne simpliciuscula* (Wight & Arn. ex Steud.) Munro ex Benth., *Cyperus cephalotes* Vahl, *Cyperus pulcherrimus* Willd. ex Kunth, *Echinochloa picta* (J.König) P.W. Michael, *Eragrostis patula* (Kunth) Steud., *Fimbristylis aphylla* Steud., *Flemingia praecox* C.B. Clarke ex Prain, *Illicium griffithii* Hook.f. & Thomson, *Oryza minuta* J. Presl, *Scleria annularis* Steud. and *Scleria terrestris* (L.) Fassett which are reported as new record for the state of Uttar Pradesh.

1876. **Kishor, K. & Pangtey, Y.P.S. 2015a.** "*Lathraea squamaria* L. (Orobanchaceae): A new record for Kumaun Himalaya". *Indian J. Forest.* 38(3): 253–254.

Abstract: *Lathraea squamaria* L. is reported as new record for Kumaun Himalaya from Munsyari, Pithoragah district with brief description, ecology and distribution.

1877. **Kishor, K. & Pangtey, Y.P.S. 2015b.** "*Eulophia bicallosa* (D. Don) P.F. Hunt & Summerh. (Orchidaceae): A new record for Kumaun Himalaya". *Indian J. Forest.* 38(4): 371–372.

Abstract: *Eulophia bicallosa* (D. Don) P.F. Hunt & Summerh. is reported as new to Kumaun Himalaya from Nainital near Ramnagar.

1878. **Kishor, K. & Pangtey, Y.P.S. 2015c.** "*Tithonia diversifolia* (Hemsl.) A. Gray (Family: Asteraceae): An exotic in the process of naturalization in Nainital (Kumaun Himalaya)". *J. Econ. Taxon. Bot.* 39(3-4): 542–543.

Abstract: The flora of Nainital is well explored and studied by several workers (Hooker 1872-1897; Duthie 1906; Jain 1956; Gupta 1968 and others); but no published record of *Tithonia diversifolia* (Hemsl.) A. Gray is available from Kumaun so far. However, *T. diversifolia* has been reported from Garhwal region especially from Mussoorie and Dehra Dun, Uttarakhand by Raizada (1976); Babu (1977); Raizada and Saxena (1978); Gaur (1999); Uniyal *et al.* (2007).

1879. **Kishor, K. & Pangtey, Y.P.S. 2015d.** "Two species of *Ceropegia* L. (Family: Asclepiadaceae): recollected after a century from Kumaun Himalaya". *J. Econ. Taxon. Bot.* 39(3-4): 539–541.

Abstract: Genus *Ceropegia* L. belonging to Asclepiadaceae is a pantropical old world genus having over 200 species distributed in the South-East Asia, Indian subcontinent, Madagascar, Arabian Peninsula, Canary Islands, most of Africa except Mediterranean region, New Guinea and northern parts of Australia. Ansari (1984) and Jagpat & Singh (1999) have revised the Indian *Ceropegia* L. and reported 44 species in the mountains of southern and western India with a few in the Himalaya, of which 28 species are said to be endemic to India. Recently Yadav and Kamble (2008) have estimated that this genus represents about 50 species out of which about 38 species occur in Western Ghats. According to Nautiyal *et al.* (2009) there are nine species of this genus known from the Indian Himalayan (both eastern and Western Himalayan region). However, from the Uttarakhand Himalaya, about five species have been collected and reported. They are: *C. angustifolia* Wight, *C. bulbosa* Roxb., *C. longifolia* Wall. (syn. *C. borii* Raizada), *C. macrantha* Wight (syn. *C. raizadiana* Babu) and *C. wallichii* Wight (Uniyal *et al.* 2007). These species are known to occur either in the sub-Himalayan tracts or in the lower valleys of Uttarakhand.

1880. **Kishor, K. & Pangtey, Y.P.S. 2016a.** "Two additional orchids for the flora of Nanital". *Indian J. Forest.* 39(2): 201–202.

Abstract: *Calanthe tricarinata* Lindl. and *Habenaria frucifera* Lindl. are being reported as additions to the flora of Nainital.

1881. **Kishor, K. & Pangtey, Y.P.S. 2016b.** "*Onosma pyramidale* Hook. f. (Family: Boraginaceae) recollected after over a Century from Kumaun Himalaya". *Indian J. Forest.* 39(3): 285–286.

Abstract: *Onosma pyramidale* Hook.f. (Boraginaceae) has been recollected after a century from Kumaun Himalaya near Kalamuni Pass, Johar valley, Pithoragarh district.

1882. **Kishor, K. & Pangtey, Y.P.S. 2016c.** "Two species of orchids recollected after over a Cntury from Nainital in Kumaun Himalaya". *J. Non-Timber Forest Prod.* 23(1): 35–36.

Abstract: *Eulophia herbacea* Lindl. and *Habenaria stenopetala* Lindl. have been recollected from Nainital after over a century.

1883. **Kishor, K. & Pangtey, Y.P.S. 2017.** "*Cynanchum arnottianum* Wight (Asclepiadaceae): A rare species recollected from Kumaun Himalaya (Uttarakhand)". *Indian J. Forest.* 40(1): 99–100.

Abstract: *Cynanchum arnottianum* Wight (Asclepiadaceae), a long lost species, is being recollected after over a century near Ratapani and Hanuman Mandir Betulidhar, Pithoragarh district in Kumaun Himalaya.

1884. **Kumar, A. 1985.** "*Thespesia lampas* (Cav.) Dalz. & Gibs. var. *longisepala* Borssum (Malvaceae)– A new record for India". *J. Econ. Taxon. Bot.* 7(3): 665–666.

Abstract: *Thespesia lampas* (Cav.) Dalz. & Gibs. var. *longisepala* Borssum known so far from Java and Borneo is reported for the first time for India from Madhya Pradesh and Uttar Pradesh.

1885. **Kumar, A. & Panigrahi, G. 1983.** "Two new species of *Cotoneaster* Medic. (Rosaceae) from the Himalaya". *Bull. Bot. Surv. India* 31(1-4): 108–113.

Abstract: Two new species of *Cotoneaster* Medic. viz., *C. confuses* allied to *C. affinis* Lindl. from Himachal Pradesh, Kashmir, Uttar Pradesh & Sikkim and *C. parkinsonii* allied to *C. schlechitendalii* Klotz from Dwali, Pindow valley, Almora district, Uttar Pradesh have been described and illustrated.

1886. **Kumar, A. & Srivastava, S.K. 2016.** "*Girardinia diversifolia* (Link) Friis subsp. *suborbiculata* (C.J. Chen) C.J. Chen & Friis (Urticaceae): A new record for India". *Indian J. Forest.* 39(2): 151–153.

Abstract: *Girardinia diversifolia* (Link) Friis subsp. *suborbiculata* (C.J. Chen) C.J. Chen & Friis, so far known from China and South Korea is reported for the first time from Pauri, Garhwal region, Uttarakhand, as a new record to Indian flora.

1887. **Kumar, A., Adhikari, B.S. & Rawat, G.S. 2016.** "New phytogeographically noteworthy plant records from Uttarakhand, western Himalaya, India". *J. Threatened Taxa* 8(6): 8943–8947.

Abstract: In the present paper, the authors recorded three species of angiosperms viz., *Dontostemon glandulosus, Potentilla pamirica* and *Carex sagaensis* for the first time from Nanda Devi Biosphere Reserve in Uttarakhand, Western Himalaya. These species had not been reported from the state of Uttarakhand, Western Himalaya till date. Since these species are restricted in distribution and very little is known about them, we provide diagnostic features of these species along with photographs to aid field identification, phytogeographic and ecological notes.

1888. **Kumar, A., Mitra, M., Adhikari, B.S. & Rawat, G.S. 2013a.** "Additions to the plant wealth of Nanda Devi Biosphere Reserve, Western Himalaya". *Indian Forester* 139(10): 959–961.

Abstract: Sixteen plant species has been reported as additions to the plant wealth of Nanda Devi Biosphere Reserve, Western Himalaya. These species are recorded from Upper Dhauli Valley (*ca* 727.71 km^2) which falls under the Trans-Himalayan region in Chamoli district of Uttarakhand from 3000 to > 6000 m.

1889. **Kumar, P., Mishra, S. & Narain, S. 2008a.** "*Alternanthera philoxeroidesa* (Mart.) Griseb.– An addition to Uttar Pradesh". *J. Indian Bot. Soc.* 87(3&4): 285–286.

Abstract: *Alternanthera philoxeroides* (Mart.) Griseb. belong to family Amaranthaceae, so far not reported from Uttar Pradesh. This species is first time collected from Ghazipur district. The detail description, up to date nomenclature and illustration of the species is provided for easy identification.

1890. **Kumar, P., Mishra, S. & Narain, S. 2008b.** "Extended distribution of rare and less known *Ranunculus cantoniensis* DC. in Uttar Pradesh". *J. Phytol. Res.* 21(1): 147–148.

Abstract: *Ranunculus cantoniensis* DC. of family Ranunculaceae, a rare and less known taxon so far reported only from terai region of Uttar Pradesh, is now reported for the first time from Gangetic plain of the state showing its extended distribution. Brief description along with citation and illustration are provided for easy identification.

1891. **Kumar, S. & Kumar, P. 2018.** "Notes on occurrence and status of *Acronychia pedunculate* (L.) Miq. (Rutaceae) in Golatappar fresh water swamp of Doon valley, Uttarakhand". *Indian J. Forest.* 41(1): 53–55.

Abstract: The paper confirms the presence of *Acronychia pedunculate* in Golatappar swamp. The species was earlier reported to be absent during studies conducted in 1992 and 2002.

1892. **Kumar, S. & Mishra, A.K. 2010.** "Rediscovery of *Festuca debilis* (Stapf) Alexeev (Poaceae), a little known endemic species of western Himalaya". *Phytotaxonomy* 10: 5–8.

Abstract: *Festuca debilis* (Stapf) Alexeev is an endemic fescue grass of North West Himalayas. It was first collected by J.F. Duthie in c. 1890 from Kashmir. After a lapse of about 87 years, it was recollected from Chakrata (Jaunsar Bawar), Uttarakhand. Detailed description and analytical drawing along with map of the area are provided.

1893. **Kumar, S. & Rao, A.S. 1984.** "*Pulicaria petiolaris* Jaub. & Spach (Asteraceae)– A naturalized rare species in the Western Himalaya". *Indian J. Forest.* 7(1): 65–67.

Abstract: *Pulicaria petiolaris* Jaub. & Spach has been reported from Chakrata hills (U.P.) after a gap of over ninety years back. Earlier it was reported from lower Tons valley near Tiuni.

1894. **Kumar, S., Narain, S., Rawat, A., Renu, Kaur, J. & Fatima, N. 2018.** "*Diospyros montana* Roxb. (Ebenaceae): New addition to the flora of Allahabad district, Uttar Pradesh, India". *Environm. & Ecol.* 36(4A): 1097–1099.

Abstract: Regular investigations were carried out in the study area and the results have shown that *Diospyros montana* Roxb. is reported for the first time as an addition to the flora of Allahabad district, Uttar Pradesh. The paper discusses the major identification characters of the genus and gives information about current scenario of *Diospyros* L. in Allahabad region. Important characters were recorded for speedy identification.

1895. **Kumar, V., Chowdhey, H.J. & Murthy, K.R.K. 2012.** "*Neottia chandrae* Raskoti *et al.* (Orchidaceae): A new addition to the orchid flora of India". *Indian J. Forest.* 35(3): 375–376.

Abstract: *Neottia chandrae* Raskoti *et al.* described from Nepal is reported as an addition to the orchid flora of India from the Valley of Flowers National Park, Uttarakhand. A detailed description, ecology, phenology, distribution and photo-plate for the species is provided.

1896. **Kumar, V., Lawkush, Chowdhey, H.J. & Bankoti, N.S. 2014.** "On the occurrence of *Eulophia spectabilis* (Dennst.) Suresh [Orchidaceae] in Uttarakhand". *Indian J. Forest.* 37(2): 185–188.

Abstract: In the present communication reports the first authentic specimens of *Eulophia spectabilis* (Dennst.) Suresh from Ghansyali, Tehri Garhwal district of Uttarakhand.

1897. **Kumari, B. 2015.** "Some new records of Poaceae in Moradabad district of Rohilkhand region of Uttar Pradesh, India". *J. Pl. Develop. Sci.* 7(7): 573–577.

Abstract: The extensive survey of grasses growing throughout the Moradabad district was carried out during 2011-2013. A total number of 62 species under 47 genera of grasses were collected and identified. In the present investigation nine genera namely *Arachne racemosa* (Heyne) Ohwi. *Arundo donax* L., *Bambusa arundinacea* Willd., *Cymbopogon citratus* (DC) Stapf., *Hygroryza aristata* (Retz.) Nees., *Iseilema laxum* Hack, *Leersia hexandra* Sw., *Thysanolaena maxima* (Roxb) O. Kuntz and *Urochloa panicoides* P. Beauv., three species of *Eragrostis* namely *E. diarrhea* (Schult.) Steud., *E. japonica* (Thumb) Trin., *E. tenella* L., one species of *Digitaria*, (*D. setigera* Roth ex Roem. et Schult.), one species of *Saccharum* (*S. bengalense* Retz.) and one species of *Sporobolus* (*S. marginatus* Hochst. ex A. Rich.) have been recorded for the first time from the study area which have not been listed by Paliwal and Singh (1982).

1898. **Lal, J., Rauf, A., Alam, M., Khair, S. & Ahmad, I. 2002.** "*Indigofera nummularifolia* (L.) Livera ex Alston– A new record for Uttar Pradesh". *J. Econ. Taxon. Bot.* 26(3): 607–608.

Abstract: *Indigofera nummularifolia* (L.) Livera ex Alston, collected from Chitrakoot forest, is represented here as a new record for Uttar Pradesh, India.

1899. **Lata, K. & Narain, S. 2008.** "Additions to the family Asteraceae in flora of Allahabad". *J. Phytol. Res.* 21(2): 277–279.

Abstract: This paper gives an enumerative account of 12 species belonging to 10 genera of family Asteraceae which are new addition to the flora of Allahabad (U.P.). The paper provides nomenclature, description, locality and field number of each species collection from the Allahabd district.

1900. **Lata, K., Mishra, S. & Narain, S. 2008.** "Notes on occurrence of *Synedrella vialis* (Less.) A. Gray in Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 32(3): 610–612.

Abstract: *Synedrella vialis* (Less.) A Gray was collected from Gorakhpur and Kushinagar districts of Easter Uttar Pradesh. This species is so far reported only from Maharashtra, Uttaranchal (Dehra Dun) and Karnataka. Thus, it constitutes a new distributional record for Uttar Pradesh.

1901. **Lawkush & Debta, M.R. 2014.** "Notes on an rare species of the genus *Androcorys* (Orchidaceae)– *A. josephi* (Rchb.f.) Agrawala & H.J. Chowdhery in India". *Indian J. Forest.* 37(4): 473–476.

Abstract: Observations on the morphological variations in *Androcorys josephi* (Rchb.f.) Agrawala & H.J. Chowdhery (Orchidaceae), collected from Pithoragarh district of Uttarakhand along with notes on its rare status are discussed.

1902. **Mahapatra, S., Ghorai, A. & Mondal, M.S. 1992.** "*Cypripedium tibeticum* King ex Rolfe– A new distributional record from Valley of Flowers (Garhwal Himalaya)". *J. Econ. Taxon. Bot.* 16(3): 575–576.

Abstract: *Cypripedium tibeticum* King ex Rolfe has been recorded for the first time for Garhwal Himalaya from Valley of Flowers. Earlier this species is known only from Sikkim.

1903. **Maiti, G.G. 1982.** "Recollection of *Saussurea neglecta* Ludlow (Asteraceae) from North-West Himalaya". *J. Econ. Taxon. Bot.* 3: 669–671.

Abstract: After a lapse of about 90 years the present author collect *Saussurea neglecta* Ludlow in 1976 from Kutti valley region of Kumaon wherefrom Duthie has collected this plant first in 1886. So, this collection is no doubt noteworthy due to its rare occurrence.

1904. **Maiti, G.G. 1986.** "On the recollection of *Campanula wattiana* Nayar & Babu from Uttar Pradesh, India". *Indian Forester* 112(5): 456–457.

Abstract: *Campanula wittiana* Nayar & Babu is described in 1970 based on the old collections from Jammu & Kashmir, Uttar Pradesh and Himachal Pradesh during 1864-1900. After a lapse of about 75 years this plant again been collected from one of the type localities of Uttar Pradesh.

1905. **Maiti, G.G., Dutta, R.M. & Babu, C.R. 1980.** "*Aconogonum kuttiense* (Polygonaceae)– A new species from N.W. Himalaya". *J. Bombay Nat. Hist. Soc.* 77(2): 303–305.

Abstract: *Aconogonum kuttiense* allied to *A. tortuosum* (D. Don) Hara has been described and illustrated from Kutti valley, Kumaon in N. W. Himalaya.

1906. **Malhotra, C.L. 1966.** "New distributional records of plants from the upper Gangetic plain". *Bull. Bot. Surv. India* 8(1): 77–78.

Abstract: Two species, viz., *Eulophia graminea* Lindl. and *Cyperus silletensis* Nees has been recorded as new for the Upper Gangetic Plain from district of Lakhimpur-Kheri.

1907. **Malhotra, C.L. 1969.** "*Nervilia crispata* (Bl.) Schltr.– A new record for the Upper Gangetic plain". *Bull. Bot. Surv. India* 11(1&2): 208.

Abstract: An interesting orchid *Nervilia crispata* (Bl.) Schltr. has been reported from for the first time for Upper Gangetic plain and North-western India from Bibiwala forest, Rishikesh, Uttar Pradesh. Earlier this species was reported from Sikkim and south-western India.

1908. **Malhotra, C.L. & Balodi, B. 1984a.** "A new species of *Eulophia* R. Br. (Orchidaceae) from Gori valley". *Bull. Bot. Surv. India* 26(1&2): 92–94.

Abstract: A new species of *Eulophia* R. Br. viz., *E. ucbii* allied to *E. graminea* Lindl. has een described and illustrated from Garjia, Gori valley, Pithoragarh.

1909. **Malhotra, C.L. & Balodi, B. 1984b.** "A new species of *Corallorhiza* Gagnep. from Gori valley". *Bull. Bot. Surv. India* 26(1&2): 108–109.

Abstract: A new species of *Corallorhiza* Gagnep. viz., C. *trifida* Chatel has been desbribed and illustrated from Gori valley.

1910. **Malhotra, C.L. & Balodi, B. 1984c.** "A new variety of *Bulbophyllum reptans* (Lindl.) Lindl. from Gori valley". *Bull. Bot. Surv. India* 26(1&2): 110–111.

Abstract: A new variety of *Bulbophyllum reptans* (Lindl.) Lindl. viz., *B. reptans* var. *acuta* Malhotra & Balodi has been described and illustrated from Gorpatta, Gori valley, Pithoragarh.

1911. **Malhotra, C.L. & Balodi, B. 1984d.** "A new variety of *Elaeagnus kanaii* Momiyama (Elaeagnaceae) from Garhwal". *Bull. Bot. Surv. India* 26(1&2): 121–122.

Abstract: A new variety of *Elaeagnus kanaii* Momiyama viz., *E. kanaii* var. *osmastonii* (Elaeagnaceae) has been described and illustrated from Khatik Swami Reserve, Garhwal.

1912. **Malhotra, C.L. & Balodi, B. 1984e.** "*Salix lindleyana* Wallich *ex* Anderss. var. *microphylla* Anderss.– A new record for India". *Bull. Bot. Surv. India* 26(1&2): 132.

Abstract: Hitherto *Salix lindleyana* Wallich *ex* Anderss. var. *microphylla* Anderss. is known to occur in Nepal, the present report of its distribution extends to India from Gori valley, Kumaon.

1913. **Malhotra, C.L. & Balodi, B. 1984f.** "*Epilobium trilectorum* Raven- A new record for India". *J. Econ. Taxon. Bot.* 5(4): 983–984.

Abstract: *Epilobium trilectorum* Raven has been reported for the first time for the Indian flora from Pindari bugyals, Kumaon Himalaya. Hitherto this species is known to occur from Nepal, Tibet and Bhutan. With the present report the distributional range of this species extends to Kumaon Himalaya in the west.

1914. **Malhotra, C.L. & Balodi, B. 1985a.** "*Elatostema sessile* J.R. & G. Forst. var. *pubescens* Hook.f.– A new record for North Western India". *J. Econ. Taxon. Bot.* 6(2): 461–462.

Abstract: *Elatostema sessile* J.R. & G. Forst. var. *pubescens* Hook.f. has been reported first time from Gori valley, Kumaon, earlier reported from Nilgiri, Naga Hills and Penang.

1915. **Malhotra, C.L. & Balodi, B. 1985b.** "*Phyllanthus scabrifolius* Hook.f.– A poorly known species from Kurnaon". *J. Econ. Taxon. Bot.* 6(2): 463–464.

Abstract: *Phyllanthus scabrifolius* Hook.f. hitherto known to occur only from Konkan in India and supposed to be endemic to this region. With the present record the distributional range of this species extends in the north to Kumaon far from its type locality.

1916. **Malhotra, C.L. & Balodi, B. 1985c.** "*Herminium mackinnoni* Duthie– An overlooked species from Kumaon". *J. Econ. Taxon. Bot.* 6(2): 465–466.

Abstract: *Herminium mackinnoni* Duthie has been reported after a gap of over 72 years from Dafia Dhoora top, Kumaon.

1917. **Malhotra, C.L. & Balodi, B. 1985d.** "Three new records of *Epilobium* species from Kumaon". *J. Econ. Taxon. Bot.* 6(2): 472–473.

Abstract: Three new records of *Epilobium* viz., *E. brevifolium* D. Don subsp. *pannosum* (Hausskn.) Raven, *E. conspersum* Hausskn. and *E. sikkimense* Hausskn. subsp. *sikkimense*

Raven has reported for the first time from Kumaon, hitherto known to occur from Eastern Himalaya, Burma, Bhutan, Tibet and Nepal.

1918. **Malhotra, C.L. & Balodi, B. 1985e.** "Two new plant records for North western Himalaya". *J. Econ. Taxon. Bot.* 7(3): 585–587.

Abstract: *Arisaema leschenaultia* Bl. and *Rhaphidophora hookeri* Schott are reported here as new records for North western Himalaya from Gori valley, Pithoragarh.

1919. **Malhotra, C.L. & Basu, D. 1984a.** "A new variety of *Elaeagnus kanaii* Momiyama (Elaeagnaceae) from Garhwal". *Bull. Bot. Surv. India* 26(1&2): 121–122.

Abstract: A new variety of *Elaeagnus kanaii* Momiyama (Elaeagnaceae) viz. *E. kanaii* var. *osmastonii* has been described from Girgaon, Garhwal.

1920. **Malhotra, C.L. & Singh, S. 1983.** "*Oberonia prainiana* King and Pantl. (Orchidaceae)– A new record for North West Himalaya". *Indian J. Forest.* 6(4): 337–338.

Abstract: *Oberonia prainiana* King and Pantl. (Orchidaceae) has been recorded as new for North West Himalaya from Gori valley, Pithoragarh district of Kumaun, Uttar Pradesh.

1921. **Malhotra, C.L., Arora, C.M. & Balodi, B. 1985.** "New or little known plants from Kumaon". *Indian J. Forest.* 8(1): 72–73.

Abstract: Four species viz., *Crinum amoenum* Roxb. ex Ker-Gawl., *Heracleum canescens* Lindl., *Murdannia spirata* (L.) Bruckner and *Pleurospermum densiflorum* Benth. ex C.B. Clarke has been reported as new to Kumaon.

1922. **Malhotra, C.L., Arora, C.M. & Balodi, B. 1986.** "*Silene setisperma* Majumdar (Caryophyllaceae)– A rare species in Kumaon". *Indian J. Forest.* 9(1): 80–81.

Abstract: A rare species *Silene setisperma* Majumdar has been recorded from Tajam Haya after a gap of about 50 years. Previously this species reported from Kumaun in 1874 by Hooker and Duthie in 1886 and Champion in 1924 from Gori Valley.

1923. **Malhotra, C.L., Balodi, B. & Singh, S. 1988.** "Two little known plants from Western Himalaya". *J. Econ. Taxon. Bot.* 12(1): 237–240.

Abstract: *Clematis smilacifolia* Wall. has been collected after a lapse of 50 years from Pithoragarh district and *Dufrenoya granulata* Stauff from Kumaon in north-western Himalaya.

1924. **Malhotra, C.L., Singh, S. & Balodi, B. 1984.** "New plant records from Kumaon Himalaya". *J. Econ. Taxon. Bot.* 5: 397–398.

Abstract: *Hedyotis auriculata* L., *Osbeckia truncata* D. Don, *Saxifraga oppositifolia* L. and *Saxifraga poluniniana* H. Sm. var. *mucronata* Bhatt. et Viswan. are described here as new records from Kumaon Himalaya.

1925. **Malik, V. & Mohammad, I. 2012.** "*Oenothera stricta* Ledeb. ex Link, a new exotic plant report for North West Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 36(4): 848–850.

Abstract: The study reports the occurrence of a new exotic plant species *O. stricta* from Saharanpur district. It is characterised by presence of cross shaped stigma.

1926. **Mamgain, S.K. 1990.** *Cicerbita macrantha* (Hook.f. and Thoms. ex Cl.) Beauv.– A new record for North-West Himalaya. In: Gupta, B.K. (ed.), *Higher Plants of Indian*

Subcontinent (Indian J. Forest., Addl. Ser.) 1: 23-24. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: *Cicerbita macrantha* (Hook.f. and Thoms. *ex* Cl.) Beauv. has been recorded for the first time for North-West Himalaya from Dharansi, Nanda Devi National Park, Chamoli district. This species is earlier recorded only from Eastern Himalaya.

1927. **Mamgain, S.K. 1992.** "*Cicerbita filicina* (Duthie ex Stebbins) Mamgain & Rao (Asteraceae)– A rare endemic in the North Western Himalaya". *Indian J. Forest.* 15(2): 188.

Abstract: The present paper deals with *Cicerbita filicina* (Duthie ex Stebbins) Mamgain & Rao which is endemic to Kumaun, Uttar Pradesh is represented by only four collections including the Type collection, at Dehra Dun herbarium (DD) while at CAL it is represented barely by two specimens. A brief note on the species is provided alongwith its type photograph.

1928. **Manikandan, R., Srivastava, S.K. & Uniyal, B.P. 2013.** "A new name for *Sedum pedicellatum* (Crassulaceae)". *J. Jap. Bot.* 88(6): 389.

Abstract: A new species of *Sedum* L. was described from Western Himalaya and named as *Sedum pedicellatum* N. B. Singh & U. C. Bhattach. The name is a later homonym and illegitimate. Hence, as per Art. 53.1, Melbourne code, 2012, a new name *Sedum bhattacharyyae* is hereby proposed.

1929. **Maulik, M. 1971.** "*Tetrastigma indicum* M. Maulik, *spec. nov.*– A new and interesting Vitaceae from India and Sikkim Himalaya". *Bull. Bot. Surv. India* 13(3&4): 352–353.

Abstract: A new and interesting species of Vitaceae viz., *Tetrastigma indicum* M. Maulik allied to *T. serrulatum* (Roxb.) Pl. has been described and illustrated from G. Valley, on way to Hilam, Kumaon. This species is also reported from Sikkim, Assam and West Bengal.

1930. **Mehrotra, B.N. & Aswal, B.S. 1980.** "New or little known plants of Chamoli district (U.P.)". *Indian J. Forest.* 3(3): 277–278.

Abstract: Eight species of plants, hitherto not recorded in the litareture has been recorded for the first time from Chamoli district of Uttar Pradesh accompanied with locality, altitude, field numbers and phenology.

1931. **Mehrotra, B.N., Aswal, B.S. & Trivedi, B.S. 1979.** "New plant records from Garhwal Himalaya". *Indian J. Forest.* 2(1): 25–26.

Abstract: In the present paper twenty one species has been recorded for the first time from Garhwal Himalaya.

1932. **Mehrotra, B.N., Aswal, B.S. & Trivedi, B.S. 1980.** "New or little known plants of Chamoli district (U.P.)". *Indian J. Forest.* 3: 277–278.

1933. **Mishra, S. & Khanna, K.K. 2009.** "Three new records of angiosperms for Uttar Pradesh". *J. Econ. Taxon. Bot.* 33(2): 335–336.

Abstract: *Cucumis setosus* Cogn. (Cucurbitaceae), *Oropetium roxburghianum* (Steud.) S.M. Phillips (Poaceae) and *Tephrosia tinctoria* (L.) Pers. (Fabaceae) have been reported as new records for the flora of Uttar Pradesh.

1934. **Misra, B.K. & Verma, B.K. 1979.** "*Cyperus melanospermus* (Nees) Valck-Sur. subsp. *bifolius* (Miq.) Kern (Cyperaceae): A new record for Uttar Pradesh". *Indian J. Forest.* 2(2): 169–170.

Abstract: *Cyperus melanospermus* (Nees) Valck-Sur. subsp. *bifolius* (Miq.) Kern has been recorded for the first time for Uttar Pradesh from Garwa fort area of Allahabad district. Detailed description along with a key to differentiate it from the nearest species *C. brevifolius* has been provided.

1935. **Misra, B.K. & Verma, B.K. 1983.** "Further contribution to the flora of Upper Gangetic Plain". *Indian J. Forest.* 6(2): 165–167.

Abstract: Five species viz., *Achyranthes aspera* var. *pubescens* (Moq.) Townsend, *Amaranthus graecizens* subsp. *silvestris* (Vill.) Brenan, *Canscora decurrens* Dalzell, *Cuscuta australis* R. Br. and *Hemigraphis crenata* (Benth. ex Hohen.) Bremek. have been reported from Allahabd district.

1936. **Misra, B.K. & Verma, B.K. 1987.** "New additions to the flora of Allahabad district (Uttar Pradesh)". *J. Econ. Taxon. Bot.* 10(2): 367–370.

Abstract: The paper enumerates 42 plant species belonging to 36 genera and 18 families of angiosperms as new records for the flora of Allahabad district (U.P.).

1937. **Misra, O.P. 1992.** "New distribution records of plants from the Upper Gangetic plain". *J. Econ. Taxon. Bot.* 16(1): 107–108.

Abstract: *Trifolium dubium* Sibth. and *Scilla biflora* L. have been reported as new record for India from Bahraich district, U.P. Nine other speces have been reported as new record for Upper Gangetic plain from Bahraich and Mirzapur districts of Uttar Pradesh.

1938. **Mohammad, I., Tyagi, A., Saini, L. & Malik, V. 2018.** "*Solanum sisymbriifolium* Lam. (Solanaceae): A new exotic spiny beauty for North-West Uttar Pradesh". *Phytotaxonomy* 18: 100–103.

Abstract: While exploring the dendroids of North West Uttar Pradesh, the author collected *Solanum sisymbriifolium*, a South American spiny plant from Saharanpur division. After reviewing its distribution through flora and available literatures, it has been found that this species is a new record for the flora of north-west Uttar Pradesh. A detailed description of the species along with coloured illustration and specimen examined are presented in the paper.

1939. **Mukherjee, P.K. & Constance, L. 1986.** "Two new genera of Indian Umbelliferae (Apiaceae)". *Brittonia* 38(2): 145–149.

Abstract: Two new monotypic genera are proposed: **Karnataka,** based upon *Schultzia? benthamii* C. B. Clarke (= *K. benthamii*) from southern Peninsular India and **Kedarnatha,** based on **K. sanctuarii**, recently obtained from the Himalaya. Neither genus appears to be closely related to other apioid genera of our area.

1940. **Murti, S.K. 1976.** "*Fimbristylis narayanii* C.E.C. Fischer– A new record from North West Himalaya". *Bull. Bot. Surv. India* 18(1-4): 247.

Abstract: *Fimbristylis narayanii* C.E.C. Fischer, a species described from the south (Travancore and Madras) has reported here for the first time for North West Himalaya from Mondal area, Chamoli district.

1941. **Murti, S.K. 1987.** "A taxonomic study of some Cyperaceae of North west Himalayan and sub-Himalayan tract". *J. Econ. Taxon. Bot.* 9(2): 329–341.

Abstract: The paper deals with the sedge flora comprising 8 genera and 28 species of the northwest Himalayan and sub-Himalayan tracts. Keys to the genera and species are provided.

1942. **Murti, S.K. 2001.** *Flora of Cold Deserts of Western Himalaya,* Vol. 1 *(Monocotyledons)*. Botanical Survey of India, Calcutta.

1942a. **Murti, S.K., Singh, D.K. & Singh, S. 2000.** Plant Diversity in Lower Gori valley, Pithoragarh, U.P. (Hydro-Electric Project Area). In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.,* Addl. Ser.] 10: 1–284. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: A total of 706 species belonging to 483 genera and 138 families have been recorded from Lower Gori valley Hydro-electric project area, Pithoragarh district of Uttar Pradesh. Within 706 species, 651 species belongs to angiosperms, 2 gymnosperms and rest 53 are pteridophytes.

1943. **Murty, Y.S. & Singh, V. 1961a.** "Flora of Hastinapur". *Agra Univ. J Res. (Sci.)* 10(2): 193–242.

1944. **Murty, Y.S. & Singh, V. 1961b.** "New plant records for the Upper Gangetic Plain from Merrut and its neighbourhood". *Proc. Natl. Acad. Sci., India* 27B: 13–17.

1945. **Murty, Y.S. & Singh, V. 1964.** "Two new plant records for the Upper Gangetic Plain". *Sci. & Cult.* 30: 150–151.

1946. **Murty, Y.S. & Singh, V. 1966.** "Some little known plants from Upper Gangetic Plain". *Sci. & Cult.* 32: 597–598.

1947. **Nageswara Rao, A. 1992.** "A new species of *Nervilia* Gaud. (Orchidaceae) from Garhwal Himalaya (India)". *Indian Forester* 118(11): 846–847.

Abstract: A new species of *Nervilia* Gaud. viz., *N. gleadowii* Nageswara Rao from ehri Garhwal, U.P. is described. This species is allied to *Nervilia scottii* (Rchb.f.) Schltr. but differs in having the flowers erect and close together, the bracts erect and the lip with glabrous disc and oblong-elliptic midlobe. The specific epithet is named after Mr. F. Gleadow who collected the plant for the first time from Tehri Garhwal in 1900.

1948. **Nair, N.C. 1968.** "A new species of *Aristolochia* from Kumaon Himalaya". *Bull. Bot. Surv. India* 10(3&4): 332–333.

Abstract: A new species of *Aristolochia* viz., *Aristolochia gourigangaica* allied to *A. griffithii* Hook.f. et Thoms. has been described and illustrated from Gauriganga valley at Radgadi (near Munshiari), Kumaon Himalaya.

1949. **Naithani, B.D. 1971.** "A report on occurrence of *Hydrobryum griffithii* (Wall.) Tulasne (Podostemaceae) in Garhwal Himalaya". *Bull. Bot. Surv. India* 13(1&2): 156.

Abstract: *Hydrobryum griffithii* (Wall.) Tulasne has been reported for the first time for Western Himalaya from Nigoli valley near Jakhmolla, south of Tungnath. Earlier reported from N. Assam, Meghalaya, Manipur, N. Thailand, Tonkin and Nepal.

1950. **Naithani, B.D. 1972.** "Two interesting records from Western Himalaya". *Bull. Bot. Surv. India* 14(1-4): 171–172.

Abstract: *Leontopodium fimbrilligerum* J.R. Drumm. and *Rhododendron nivale* Hook.f. have been proved to be new records for Western Himalaya from Tapovan (Tehri-Garhwal) and Sivaling Base (Tehri Garhwal), respectively.

1951. **Naithani, H.B. 1974.** "*Psilotrichum* (Roxb.) Moq.– A overlooked record for Northern India". *Indian Forester* 100(1): 79–80.

Abstract: *Psilotrichum ferrugineum* (Roxb.) Moq. has been reported for the first time for Northern India from Kumaon. Previously this species was reported from West Bengal, Assam, Bihar, Orissa and Madhya Pradesh.

1952. **Naithani, H.B. 1978.** "New plants record for Northern India from Garhwal Himalayas". *Indian J. Forest.* 1(3): 244–246.

Abstract: The present paper records for the first time, the occurrence of two plants viz., *Abelmoschus moschatus* Medicus subsp. *rugosus* (Wall. ex Wight & Arn.) Steud. (Malavaceae) and *Pueraria lobata* (Willd.) Ohwi (Papilionaceae) for Northern India i.e. Garhwal Himalaya from Uttarkashi and Pauri Garhwal respectively.

1953. **Naithani, H.B. 1981.** "*Ruellia ciliatiflora* Hook. (Acanthaceae)– New to Indian flora". *Indian J. Forest.* 4(3): 235.

Abstract: *Ruellia ciliatiflora* Hook. has been recorded for the first time for Indian flora from New Forest, Dehra Dun district of Uttar Pradesh.

1954. **Naithani, H.B. 1983.** "*Sedum lineare* Thunb. (Crassulaceae)– A new record for India". *Indian J. Forest.* 6(2): 169.

Abstract: *Sedum lineare* Thunb. has been reported for the first time for Indian flora from Doon Valley.

1955. **Naithani, H.B. 1991.** "Occurrence of the bamboo *Dendrocalamus patellaris* in Kumaon hills, Uttar Pradesh". *J. Bombay Nat. Hist. Soc.* 88(1): 141.

Abstract: *Dendrocalamus patellaris* Gamble has been reported for the first time for in Kumaon hills, Uttar Pradesh from Kalona, Nainital Forest Division. This species was earlier known from Arunachal Pradesh, Assam, north Bengal and Sikkim.

1956. **Naithani, H.B. 1993.** "*Dendrocalamus somdevai*: A new species of bamboo from Uttar Pradesh, India". *Indian Forester* 119(6): 504–506.

Abstract: A species of bamboo *Dendrocalamus* Nees, new to science, *Dendrocalamus somdevai* Naithani from Dehra Dun, Uttar Pradesh, India is described. This species is allied to *Dendrocalamus hamiltonii* Nees et Arn. ex Munro but differs in having culm wall 2.5-3.0 cm thick; ligule of culm sheaths dentate; anther tip apiculate, glabrous and single stigma. This taxon is described by Prof. Som Deva, ex Head, Department of Botany, D.A.V. (P.G.) College, Dehra Dun for his valuable contribution to the flora of North-Western India.

1957. **Naithani, H.B. 2013.** "Occurrence of Ginseng *(Panax pseudoginseng)* in Western Himalaya". *Indian Forester* 139(5): 473–475.

Abstract: In the present paper *Panax pseudoginseng* Wall. has been reported from Khulia Medicinal Plant Conservation Area, Munshyari, Pithoragarh district, Uttarakhand.

1958. **Naithani, H.B. & Chandra, S. 1989.** "*Synedrella vialis* (Less) A. Gray– A new record for Uttar Pradesh, India". *J. Bombay Nat. Hist. Soc.* 86(2): 272–273.

Abstract: *Synedrella vialis* (Less) A. Gray, a native of South America has been recorded for the first time for Uttar Pradesh from New Forest, Dehra Dun. This species is so far reported from Poona, Maharashtra.

1959. **Naithani, H.B. & Chandra, S. 1997.** "On the rediscovery of a rare endemic grass *Pseudodanthonia himalaica*". *Indian Forester* 123(2): 171–174.

Abstract: *Pseudodanthonia himalaica* (Hook.f.) Bor and Hubbard, a rare grass endemic to in small section on North-Western Himalaya has now been discovered after a lapse of about one hundred years.

1960. **Naithani, H.B. & Chandra, S. 1999b.** "Note on the occurrence of genus *Wigandia* Kunth in India". *Indian Forester* 125(4): 431–433.

Abstract: This paper records the wild occurrence of *Wigandia kunthii* from a large area of barren hill slopes between Rishikesh and Shivpuri in Tehri Garhwal. A description together with an illustration, for its identification is also provided.

1961. **Naithani, H.B. & Gaur, R.C. 1969.** "*Silybum marianum* (L.) Gaertn., a new record for Dehradun". *Indian Forester* 95(10): 695–696.

Abstract: Within the limits of the Flora of British India *Silybum marianum* (L.) Gaertn. (Compositae) has been recorded from West Punjab, Hazara, Peshawar, Jammu & Kashmir. Afterwards, it has occasionally been collected from Chamba and Kulu. Recently it has been found to be naturalising in the Doon valley on few localised spots. Its sporadic occurrence abruptly in Dehra Dun has been attributed to the possibility of its seeds having accompanied the immigrants from West Punjab etc., who have settled around the place where it is now spreading.

1962. **Naithani, H.B. & Raizada, M.B. 1977.** "New record of some Cyperaceae taxa in India". *Indian Forester* 103(6): 411–424.

Abstract: The paper presents a new combination i.e. *Fimbristylis falcate* (Vahl) Kunth var. *latifolia* (Kunth) Naithani et Raizada and new records of 13 taxa of sedges (Cyperaceae) in India, viz., *Cyperus sanguinolentus* Vahl subsp. *melanocephalus* (Miq.) Kern, *Fimbristylis falcata* var. *latifolia* (Kunth) Naithani et Raizada comb. Nov., *Scleria corymbosa* Roxb. from North India, *Cyperus unioloides* R. Br., *Fimbristylis salbundia* (Nees) Kunth, *F. stolonifera* C.B. Clarke for Central India; *Scleria biflora* Roxb. for Madhya Pradesh; *Cyperus melanospermus* (Nees) Valk-Sur, *Fimbristylis pierotii* Miq., *Scleria rugosa* R. Br. for Orissa; *Cyperus pulchellus* R. Br. for Orissa and Gujarat; *Fimbristylis sieberiana* Kunth for North and South India and *Fimbristylis velata* R. Br. for Karnataka. Notes on synonymy, short description, distribution and distinction from allied species are provided, species are arranged alphabetically. All specimens quoted are deposited in Dehra Dun Herbarium (DD).

1963. **Naithani, H.B. & Raizada, M.B. 1978.** "A note on the occurrence of *Fimbristylis merguensis* C.B. Clarke in India". *Indian J. Forest.* 1(2): 128–131.

1964. **Naithani, H.B. & Uniyal, B.P. 1985.** "*Sorghum arundinaceum* (Desv.) Stapf– An addition to flora of Uttar Pradesh". *Indian J. Forest.* 8(2): 158.

Abstract: *Sorghum arundinaceum* (Desv.) Stapf has been reported for the first time for the flora of Upper Gangetic Plain from Doiwala, Dehra Dun district, Uttar Pradesh.

1965. **Naithani, H.B., Chandola, S. & Chandran, M. 2009.** "On the wild occurrence of the orchid *Phaius tankervilliae* in north India". *Indian Forester* 135(4): 578–579.

Abstract: The present paper deals with the wild occurrence of *Phaius tankervilliae* from Gujars near Sultan, Corbett National Park, Uttarakhand, North India. It is growing along with a rare palm *Wallichia densiflora* in moist shady places. To facilitate identification, a description with photograph is provided.

1966. **Naithani, H.B., Dayal, R. & Bennet, S.S.R. 1978.** "Occurrence of the genus *Myagrum* Linn. (Cruciferae) in Northern India". *Indian Forester* 104(3): 171–173.

Abstract: Genus *Myagrum* Linn. (Cruciferae), viz., *M. perfoliatum* Linn. is reported from Ballupur, Dehra Dun district, Uttar Pradesh, Northern India. To facilitate the identification of this plant in India a description and an illustration is provided.

1967. **Naithani, N. 1980.** "Occurrence of *Alternanthera paronychioides* St. Hill. in Garhwal Himalaya". *Indian J. Forest.* 3(1): 23.

Abstract: *Alternanthera paronychioides* St. Hill. Has been reported from Gopeshwar, Chamoli distrct of Garhwal Himalaya.

1968. **Narain, S. & Kumar, S. 2018.** "*Trichodesma zeylanicum* (Burm. f.) R. Br.: An unwelcome addition to flora of Allahabad". *Int. J. Res.* 5(4): 731–734.

Abstract: Existence of *Trichodesma zeylanicum* (Burm. f.) R. Br. reported for the first time as an addition to the flora of Allahabad district, Uttar Pradesh. Description of the plant, habitat, phenology, distribution, ecology and socio-economic importance of the species are highlighted in this paper.

1969. **Narain, S. & Mishra, S. 2006**. "First report of *Ceratophyllum submersum* from Gangetic Plain, India". *Rheedea* 16(2): 115.

Abstract: *Ceratophyllum submersum* L. (Ceratophyllaceae), collected from Ballia district in Uttar Pradesh is the first report of this species for Gangetic Plain. Three or four times forked leaves and nutlets with a single apical spine distinguish this species from the closely allied *Ceratophyllum demersum* L.

1970. **Narain, S. & Renu, S. 2017.** "*Euphorbia clarkeana* Hook.f.: New Addition to the flora of Allahabad district, Uttar Pradesh, India". *Int. J. Theoretical & Appl. Sci.* 9(2): 161–163.

Abstract: The present paper deals with addition of genus *Euphorbia clarkeana* Hook. f. to the flora of Allahabad district, Uttar Pradesh from Shankergarh. A detailed description, updated citation, phenology, habit, distribution & photographs are provided.

1971. **Narain, S., Lata, K. & Singh, J. 2008.** "A new species of *Blumea* DC. (Asteraceae) from Uttar Pradesh, India". *Indian J. Forest.* 31(3): 443–446.

Abstract: A new species of *Blumea sonbhadrensis* (Asteraceae) is collected from the Sonbhadra of Uttar Pradesh in India, is described and illustrated.

1972. **Narain, S., Rawat, A., Kaur, J., Renu & Kumar, S. 2016.** "New addition to flora of Allahabad". *Imperial J. Interdisciplinary Res.* 2(10): 46–50.

Abstract: The author conducted floristic exploration of family Tiliaceae in Uttar Pradesh resulted in addition of three species of genus *Triumfetta* to the flora of Allahabad (U.P.) viz. *T. annua, T. rhomboidea, T. rotundifolia*. A detailed description, updated citation, phenology, habit, distribution and photographs are provided.

1973. **Nautiyal, D.C. & Gaur, R.D. 1999a.** "A new species of *Poa* L., family Poaceae from Garhwal Himalaya, India". *J. Bombay Nat. Hist. Soc.* 96(2): 285–287.

Abstract: Plant explorations in the Garhwal Himalaya yielded a new species *Poa garhwalensis* Nautiyal et Gaur sp. nov. This was collected at the Indo-Tibetan border of Chamoli district. It comes close to *Poa gammieana* Hook.f.

1974. **Nautiyal, D.C. & Gaur, R.D. 1999b.** "*Poa harae* Rajb. (Poaceae): A new record for India". *J. Bombay Nat. Hist. Soc.* 96(2): 359–361.

Abstract: A new species of *Poa* L., viz., *Poa harae* Rajb. has been recorded for the first time for Indian flora from moist alpine glacier zones of Gaumukh (Uttarkashi) at 4600-4800 m.

1975. **Nautiyal, K.N. & Murty, Y.S. 1986.** "New distributional records from Chamoli dist. in N.W. Himalayas". *J. Bombay Nat. Hist. Soc.* 83(3): 686-687.

Abstract: Ten species of plants has been reporded for the first time for N.W. Himalaya from Chamoli district.

1976. **Nautiyal, S. 1981.** "Some medicinal plants of Garhwal hills– A traditional use". *J. Sci. Res. Pl. Med.* 2: 12–18.

1977. **Nayar, M.P. & Malick, K.C. 1969.** "A new variety of *Galium confertum* Royle ex Hook.f. from N.W. Himalaya". *Bull. Bot. Surv. India* 11(3&4): 429.

Abstract: A new variety of *Galium confertum* Royle ex Hook.f. viz. *G. confertum* var. *laceanum* has been described and illustrated from Rogi cliffs, Bashahr.

1978. **Negi, K.S. & Muneem, K.C. 1997.** Ädzukibean [*Vigna angularis* (Willd.) Ohwi & Ohashi]– A new crop for Uttarakhand Himalaya". *Indian J. Forest.* 20(2): 144–146.

Abstract: Adzukibean has recently been introduced in the Uttar Pradesh Himalaya through the co-ordinated Research project on Under-utilized and Under-exploited plants. Because of its dwarfness, early maturing and relatively high degree of resistence to certain storage pests, it may prove popular to other legume crops with the farmers of Uttarakhand Himalaya. Sixty accession of adzukibean built up from Himachal Pradesh (H.P.), Uttar Pradesh Himalaya (U.P.) and 6 countries abroad, were evaluated during Kharif seasons of 1989-1994. Some of the promising accessions have been identified for different agro-botanical traits. These accessions may be tried in the farmers field for its acceptance as a grain legume.

1979. **Negi, K.S. & Pant, K.C. 1998.** "Willd species of *Abelmoschus* Medic. (Malvaceae) from central Himalayan regions of India". *J. Bombay Nat. Hist. Soc.* 95(1): 148–150.

Abstract: Three species of wild Okra, viz., *Abelmoschus moschatus* Medic., *A. ficulneus* (L.) Wight & Arn. ex Wight and *A. manihot* subsp. *tetraphyllus* (Roxb.) ex Hornem. Borss. var. *pungens* (Roxb.) Hochr. has been collected from eight hill districts of Uttar Pradesh.

1980. **Negi, K.S., Koppar, M.N. & Pant, K.C. 1989.** "*Eriophyton wallichii* Benth. (Lamiaceae)– An addition to the flora of Chamoli". *J. Econ. Taxon. Bot.* 13(1): 83–84.

Abstract: *Eriophyton wallichii* Benth. (Lamiaceae) has been reported for the first time to the flora of Chamoli from Braham mathya. This species is so far known from North-Western to central Himalaya, West Nepal to South-West China, Sikkim.

1981. **Negi, K.S., Pant, K.C. & Gaur, R.D. 1988.** "Sea-buckthorn, Hippophae– a pickle plant from Central Himalaya". *Acta Bot. Ind.* 18: 274–275.

1982. **Negi, K.S., Rathoure, S.S., Sharma, A.K., Pant, Y.K. & Muneem, K.C. 2006.** "Addition to the rare and economically useful plant germplasm *Allium clarkei* Hook.f. from Uttarakhand". *Indian J. Pl. Genet. Resour.* 19(1): 128–129.

1983. **Pande, H.C., Datt, B., Rana, T.S., Husain, T. & Rao, R.R. 2002.** "An addition to the flora of Corbett Tiger reserve, Uttaranchal". *J. Econ. Taxon. Bot.* 26(2): 396–406.

Abstract: The present paper deals with 146 species, which are addition to the flora of Corbett Tiger reserve in Uttaranchal. Each species is provided wirh correct botanical name and important synonym(s), if any. Nomenclature has been made up-to-date. Precise information on occurrence, phenology and locality with collection number is also given for each species.

1984. **Pande, P.C. 1982.** "New distributional records of plants from Kumaun (Uttar Pradesh)". *Indian J. Forest.* 5(2): 154–155.

1985. **Pande, P.C. 2001.** "*Calandrinia ciliata* (Ruiz & Pavon) DC. (Portulacaceae): A new record for India". *J. Econ. Taxon. Bot.* 25(2): 269–270.

Abstract: *Calandrinia ciliata* (Ruiz & Pavon) DC. hitherto reported from South America has been reported for the first time for India from Someshwar, Almora district, Kumaon.

1986. **Pande, P.C. & Joshi, G.C. 1989.** "New or little known plants from Kumaun Himalaya". *J. Econ. Taxon. Bot.* 13(2): 347–349.

Abstract: Nine species belonging to six families turned out to be new to Kumaun Himalaya.

1987. **Pande, P.C. & Pangtey, Y.P.S. 1985.** "New or little known plants from Kumaon– II". *J. Econ. Taxon. Bot.* 7(3): 639–641.

Abstract: *Callitriche syagnalis* Scop. (Callitrichaceae), *Goodyera biflora* (Lindl.) Hook.f. (Orchidaceae), *Herminium mackinnonii* Duthie (Orchidaceae), *Narcissus tezetta* Linn. (Amaryllidaceae), *Oryza rufipogon* Griff. (Poaceae), *Phalaris arundinacea* Linn. (Poaceae), *Plantago exigua* Murr. (Plantaginaceae), *Tribulus terrestris* Linn. (Zygophyllaceae), *Vulpia myros* (Linn.) Gmel. (Poaceae), *Yucca gloriosa* Linn. ((Agavaceae) and *Zeuxine strateumatica* (Linn.) Schitr. (Orchidaceae) has been reported from Almora district of Kumaun region.

1988. **Pande, P.C. & Pangtey, Y.P.S. 1987.** "*Caldesia parnassifolia* (Linn.) Parl. (Alismataceae)– A new record for Western Himalaya". *J. Bombay Nat. Hist. Soc.* 84(1): 257.

Abstract: *Caldesia parnassifolia* (Linn.) Parl. (Alismataceae) has been recorded for the first time for Western Himalaya from Naijnath, Almora district of Kumaun region.

1989. **Pandey, H.C. 1980.** "On the collection of *Parnassia wightiana* Wall. from Kumaon". *Indian J. Forest.* 3(1): 14.

Abstract: *Parnassia wightiana* Wall. has been recorded aound Bugyal Thala enroute to Namik Glacier from Namik village in Pithoragarh distrct of Uttar Pradesh.

1990. **Pandey, H.C. 1982.** "New distribution record of plants from Kumaon (Uttar Pradesh)". *Indian J. Forest.* 5(2): 154–155.

Abstract: *Cymbidium mackinnoni* Duthie (Orchidaceae) and *Monotropa uniflora* L. (Monotropaceae) have been reported from Ranikhet in Almora district (Kumaon Division), previously recorded from Garhwal.

1991. **Pandey, H.C., Tewari, R.N. & Joshi, P. 1980.** "*Diplomeris hirsuta* Lindl. (Orchidaceae)– A new record from Western Himalaya". *Indian Forester* 106(12): 869.

Abstract: *Diplomeris hirsuta* Lindl. (Orchidaceae) a terrestrial orchid reported previously from Nepal, Western Bhutan and Eastern India has now been recorded from Dogaon forest, district Nainital, Uttar Pradesh, where a characteristically localised distribution of the plant has been noticed.

1992. **Pandey, N.K. 1986.** "On the occurrence of a "New Formae"– Genus *Capsicum* sp.". *Indian Forester* 112(6): 473.

1993. **Pangtey, Y.P.S. 1978.** "On the occurrence of *Ischnochloa falconeri* Hook.f. at Nainital". *Indian J. Forest.* 1(2): 165.

Abstract: *Ischnochloa falconeri* Hook.f. (Poaceae) has been reported for the first time for Nainital, earlier known from Mussoorie to Simla.

1994. **Pangtey, Y.P.S. & Kalakoti, B.S. 1982.** "New or little known plants of Kumaon Himalaya". *Indian J. Forest.* 5(1): 76–77.

Abstract: Eighteen species belonging to 11 families turned out to be new record for Kumaon Himalaya.

1995. **Pangtey, Y.P.S. & Kalakoti, B.S. 1983.** "A note on the occurrence of *Cheirostylis griffithii* Lindl. (Orchidaceae) from Western Himalaya". *Indian J. Forest.* 6(2): 170.

Abstract: *Cheirostylis griffithii* Lindl. (Orchidaceae) has been reported for the first time for Western Himalaya from Nainital district of Kumaon. Earlier this species was reported from Meghalaya, Nagaland, Sikkim, Nepal, Bhutan, Burma and Thailand.

1996. **Pangtey, Y.P.S. & Kishor, K. 2015.** "A note on the occurrence of *Aconogonum molle* (D. Don) Hara var. *frondosum* (Meissn.) Hara (Polygonaceae) in Nainital". *J. Non-Timber Forest Prod.* 22(2): 107–108.

Abstract: *Aconogonum molle* (D.Don) Hara var. *frondosum* (Meissn.) Hara has been collected from Nainital after a long gap.

1997. **Pangtey, Y.P.S. & Rawat, G.S. 1984.** "On the recollection of two imperfectly known plants from Kumaun Himalaya". *J. Econ. Taxon. Bot.* 5: 241–243.

Abstract: *Senecio scandens* Don (Asteraceae) has been reported after more than a century from Kumaum (Munsiari and Panch Chuli basin) and *Daphne retusa* Hemsl. (Thymelaeaceae) from Sipu village, on way to Badang, Darma valley of Kumaun Himalaya.

1998. **Pangtey, Y.P.S. & Samant, S.S. 1986.** "A note on recollection and rarity of *Alectra sessiliflora* (Vahl) O. Kuntze (Scrophulariaceae) from Nainital (Western Himalaya)". *J. Econ. Taxon. Bot.* 8(2): 483–484.

Abstract: *Alectra sessiliflora* (Vahl) O. Kuntze has been recollected from Nainital (Kumaun Himalaya) after a gap of over 100 years.

1999. **Pangtey, Y.P.S. & Samant, S.S. 1988.** "Rediscovery of three rare plants from Kumaun Himalaya". *J. Bombay Nat. Hist. Soc.* 85(2): 456–457.

Abstract: The present paper reports the rediscovery of three rare species, viz., *Psilotum nudum* (Linn.) Beauv. (Pislotaceae), *Asplenium nidus* Linn. (Aspleniaceae) and *Wallichia densiflora* Mart. (Palmaceae) from Kumaun Himalaya. Earlier literature and records reveal that these species have been collected after a lapse of a considerable period from the Kumaun Himalaya. These species appear to be extremely rare because they were collected only once from one particular locality and are almost on the verge of extinction.

2000. **Pangtey, Y.P.S. & Samant, S.S. 1989.** "*Alternanthera philoxeroides* (Mart.) Griseb.– A new record for North-Western Himalaya". *J. Bombay Nat. Hist. Soc.* 86(1): 119–120.

Abstract: The collection of *Alternanthera philoxeroides* (Mart.) Griseb. from Champawat in Pithoragarh distrct of Kumaun is an important addition for the flora of Kumaun Himalaya in particular and the flora of North-Western Himalaya in general.

2001. **Pangtey, Y.P.S., Kalakoti, B.S. & Samant, S.S. 1987.** "Additions to the flora of Nainital-III. *J. Econ. Taxon. Bot.* 9(2): 471–475.

Abstract: Forty species of flowering plants have been reported as additions to the flora of Nainital in this paper.

2002. **Pangtey, Y.P.S., Pande, P.C. & Deva, Som. 1984.** "New plant records for Garhwal and Kumaun Himalaya from Almora" *J. Econ. Taxon. Bot.* 5. 827–830.

Abstract: Ten species belonging to 9 families are reported for the first time for Garhwal and Kumaon Himalaya from Almora district. The species are *Ammi majus* L. (Apiaceae), *Blyxa auberti* Rich. (Hydrocharitaceae), *Elaeocharis atropurpurea* (Retz.) Kunth (Cyperaceae), *Eriocaulon quinquangulare* L. (Eriocaulaceae), *Ludwigia perennial* L. (Onagraceae), *Orobanche aegyptiaca* Pers. (Orobanchaceae), *Oenothera speciosa* Nutt. (Onagraceae), *Panicum walense* Nutt. (Poaceae), *Plantago lanceolata* L. (Plantaginaceae) and *Papaver roheas* L. (Papaveraceae).

2003. **Pangtey, Y.P.S., Samant, S.S. & Kalakoti, B.S. 1987.** "*Oxalis lasiandra* Zucc. (Oxalidaceae)– A new record for India". *J. Econ. Taxon. Bot.* 9(2): 411–412.

Abstract: *Oxalis lasiandra* Zucc. , a native of Mexico has been recorded for the first time for the Indian flora from Chaubattia garden, Ranikhet, Kumaun.

2004. **Pangtey, Y.P.S., Samant, S.S. & Rawat, G.S. 1985.** "A note on the occurrence of *Blechnum orientale* Linn. in Kumaon Hills". *J. Econ. Taxon. Bot.* 6(3): 747–748.

Abstract: The present note records the occurrence of this rare fern *Blechnum orientale* Linn. in Nolara, Pithoragarh district, Kumaon hills for the first time.

2005. **Pangtey, Y.P.S., Tewari, L.M. & Upreti, K. 2012.** "A note on the collection of *Alternanthera pheloxeroides* (Mart.) Griseb. from the foothills of Kumaun (Uttarakhad)". *J. Econ. Taxon. Bot.* 36(2): 399–400.

Abstract: This note reports *Alternanthera pheloxeroides* (Mart.) Griseb. (Family: Amaranthaceae) from the foothills of Kumaun (Haldawani, Nainital district) in Uttarakhand for the first time.

2006. **Pangtey, Y.P.S., Kalakoti, B.S., Rawat, G.S. & Bankoti, T.N.S. 1987.** "On the occurrence *Rumex crispus* Linn. (Polygonaceae) in North India". *Indian J. Forest.* 10(1): 58–59.

Abstract: *Rumex crispus* Linn. (Polygonaceae) has been reported for the first time for North India from Nainital. Earlier this species was reported from Mount Abu, Rajasthan.

2007 **Pangtey, Y.P.S., Pande P.C., Kalakoti, B.S. & Rawat, G.S. 1984.** "New records of species from the Kumaun Himalaya". *Indian J. Forest.* 7(2): 156–157.

Abstract: Three species namely *Homonoia riparia* Lour. (Euphorbiaceae), *Hydrobryum griffithii* (Wall. ex Griff.) Tulasne (Podostemaceae) and *Hypochoeris radicata* L. (Asteraceae) has been reported for the first time from Kumaun Himalaya from Haldwani (Nainital district), below Hawalbag and Mornaula, respectively.

2008. **Pangtey, Y.P.S., Rawat, G.S., Kalakoti, B.S. & Bankoti, T.N.S. 1984.** "New distributional records of three orchids from Kumaun Himalaya". *Indian J. Forest.* 7(3): 251–252.

Abstract: Three orchids viz., *Cypripedium elegans* Rehb.f., *Diphylax griffithii* (Hook.f.) Krzl. and *Goodeyera biflora* (Lindl.) Hook.f. has reported for the first time from Kumaun Himalaya.

2009. **Pangtey, Y.P.S., Tewari, L.M., Upreti, K. & Jalal, J.S. 2008.** "On the occurrence of *Rubus niveus* Thunb. (Family Rosaceae) in the Tarai Region of Kumaon in Uttarakhand". *Indian J. Forest.* 31(1): 117–118.

Abstract: *Rubus niveus* Thunb. has been reported for the first time for Terai region of Kumaun in Uttarakhand in the flora of Upper Gangetic plain from Pantnagar University campus, Pantnagar. This species is usually known from 1200-3000 m altitude of Uttarakhand and North West Himalaya.

2010. **Pant, P.C. 1972.** "Occurrence of *Chonemorpha giriffithii* Hook.f. and *Psilotrichum ferrugineum* (Roxb.) Moq. in the Kumaon region". *Bull. Bot. Surv. India* 14(1-4): 168–169.

Abstract: *Chonemorpha giriffithii* Hook.f. and *Psilotrichum ferrugineum* (Roxb.) Moq. has been recorded for the first time for Kumaon region from Nachni-Tejum road and Gargia and Sarpadull, Ramnagar Forest Division, Uttar Pradesh, rescpective. Earlier, the former species was reported from Khasia Hills, Sikkim & North-eastern region and later from Sunderban & Calcutta (West Bengal)

2011. **Pant, P.C. 1985.** "*Merremia vitifolia* (Burm. f.) Hallier. f.– A case for reappraisal of distribution status in India". *J. Econ. Taxon. Bot.* 7(2): 441–442.

Abstract: In the present paper *Merremia vitifolia* (Burm. f.) Hallier. f. has been reported for the first time for Upper Gangetic Plain from Mirzapur and Dehra Dun.

2012. **Pant, S. 2012.** "*Senna uniflora* (Mill.) H.S. Irwin & Barneby (Caesalpiniaceae) and *Sida tiagii* Bhandari (Malvaceae): New records for the flora of Uttar Pradesh". *J. Non-Timber Forest Prod.* 19(2): 157–158.

Abstract: *Senna uniflora* (Mill.) U.S. Irwin & Bameby (Cacsalpiniaccae) and *Sida tiagii* Bhandari (Malvaceae) are reported as new records for the flora of Uttar Pradesh from National Chambal Wildlife Sanctuary.

2013. **Paszko, B. 2012.** "*Calamagrostis gamblei sp. nov.* (Poaceae) from the Western Himalayas, NW India". *Polish Bot. J. 57*(2): 327–334.

Abstract: A new grass species of *Calamagrostis* Adans. from NW India, *Calamagrostis gamblei* B. Paszko, is described and illustrated. The new species is distributed mainly in the Garhwal Himalayas, and spikelet morphology shows that it is similar to *C. stolizkai* Hook. f. and *C. moupinensis* Franch. A key to *C. gamblei* and closely related species in NW India is presented.

2014. **Paul, S.R. & Aslam, Md. 1975.** "*Oxalis acetosella* Linn. new to Upper Gangetic Plain". *Geobios* 2: 125–126.

Abstract: *Oxalis acetosella* Linn. so far not known in the Upper Gangetic Plains has been collected at National Botanic Garden, Lucknow and is encroaching on the wastelands but is still restricted to the above mentioned area. The occurrence of this species at a much lower altitude as Lucknow and at the habitat mentioned only suggests its introduction along with the seeds of some garden ornaments.

2015. **Pradeep, S.V. 1990.** "On the re-collection of *Meizotropis pellita* (Hook.f. ex Prain) Sanjappa (Leguminosae-Phaseoleae)". *J. Econ. Taxon. Bot.* 14(1): 239–240.

Abstract: *Meizotropis pellita* (Hook.f. ex Prain) Sanjappa has been re-collected after more than 70 years from Patwa Dangarh, Kumaon.

2016. **Prakash, V. 1996.** "Taxonomic notes on the status of two taxa of *Valeriana* L. (Valerianaceae)". *J. Econ. Taxon. Bot.* 20(1): 245–250.

Abstract: As a result of revisionart study of the genus *Valeriana* L., evidences have accumulated to treat *Valeriana arnottiana* Wight and *V. brunoniana* Wight & Arn. as varieties of *V. hardwickii* Wall. and *V. leschenaultii* DC. respectively. The present study records the distribution of *V. hardwickii* Wall. var. *arnottiana* (Wight) C.B. Clarke from Himalaya for the first time.

2017. **Prakash, V., Aswal, B.S. & Mehrotra, B.N. 1989.** "A new species of *Valeriana* L. (Valerianaceae) from India– A possible substitute of Indian Valerian". *Ethnobotany* 1: 47–49.

Abstract: The paper gives an illustrated account of a new species of *Valeriana*, viz., *V. mussooriensis* allied to *V. jatamansi* Jones from Mussoorie, Uttar Pradesh, India which might be a substitute of Indian Valerian (*V. jatamansi* Jones), a well known medicinal plant.

2018. **Prasad, V.P. 2010.** "Extended distribution of *Kyllinga brevifolia* var. *stellulata* (J.V. Suringar) Ohwi (Cyperaceae) in India". *J. Econ. Taxon. Bot.* 34(3): 586–587.

Abstract: Information on the extended distribution of *Kyllinga brevifolia* var. *stellulata* (J.V. Suringar) Ohwi (Cyperaceae) in India is given here along with nomenclatural citations and details of the specimens in different herbaria.

2019. **Purohit, K.M. 1985.** "A new species of *Spiraea* L. (Rosaceae) from India". *J. Econ. Taxon. Bot.* 6(1): 205–206.

Abstract: A new species of *Spiraea* L. viz., *S. panigrahiana* allied to *S. arcuata* Hook.f. has been described and illustrated from Narayan Nagar, Pithoragarh district of Uttar Pradesh.

2020. **Purohit, K.M. & Panigrahi, G. 1979.** "A new species of *Geum* L. (Rosaceae)". *Bull. Bot. Surv. India* 21(1-4): 205–207.

Abstract: A new species of *Geum* L., viz., *G. aequilobatum* Purohit et Panigrahi allied to *G. roylei* Wall. ex Bolle has been described and illustrated from Tehri Garhwal, on the way to Ghuttu.

2021. **Pusalkar, P.K. 2011.** "New genus of Himalayan Caprifoliaceae". *Taiwania* 56(3): 210–217.

Abstract: A group of Sino-Himalayan species characterized by actinomorphic corolla, without (honey-storing) lateral saccate gibbosity, 5 nectaries, anthers as long as or longer than included filaments and flat or carinate leaf vernation, is separated from *Lonicera* L. and described here as a new genus, *Devendraea* Pusalkar under the family Caprifoliaceae.

2022. **Pusalkar, P.K. 2012.** "Distributional novelties in Uttarakhand flora". *Ann. Forest.* 20(2): 244–249.

Abstract: *Galium asperifolium* Wall. var. *lasiocarpum* W.C. Chen (Rubiaceae) is reported as a new record for Indian flora. *Ceratocephala falcata* (L.) Pers. (Ranunculaceae) and *Lindelofia longiflora* (Benth.) Baill var. *levingii* (C.B. Clarke) Brand (Boraginaceae) are new records for Uttarakhand flora and *Kailashia robusta* Pimenov & Kljuykov (Apiaceae), a point endemic is reported from two additional localities in Chamoli district of Uttarakhand.

2023. **Pusalkar, P.K 2013.** "*Sarcopyramis* Wall. (Melastomataceae)– A new generic record for western Himalaya". *BSI ENVIS Newsletter* 18(2): 2–3.

Abstract: Ten populations of *Sarcopyramis nepalensis* Wall., each consisting of 50-250 individuals were located in Birthi-Ruiger forest of Pithoragarh district in Kumaun region of Uttarakhand that constitutes the first record of this genus for the Western Himalaya.

2024. **Pusalkar, P.K 2014.** "*Picrorhiza tungnathii* sp. nov. from Western Himalaya, India". *Nordic J. Bot.* 32(3): 308–313.

Abstract: The new species *Picrorhiza tungnathii* Pusalkar is described and illustrated from the western Himalaya, India. It is distinguished from the allied *P. kurrooa* Royle ex Benth. by being 10–25 cm tall, having a moderately dense, (10–)15–25 flowered spike, a zygomorphic, 2 lipped, glandular ciliate corolla that is equaling or slightly exceeding the calyx and partly visible or sub exserted between the calyx lobes, a conspicuously long (longer than the corolla lobes), curved corolla tube (1/2–4/5 the length of the calyx), unequal corolla lobes that are ovate lanceolate to lanceolate, acute to sub acuminate and moderately ciliate, a mid lobe of the upper lip that is obliquely erect, galeate with retuse or emarginate apex, lateral corolla lobes that are slightly smaller than the mid lobe of the upper lip, a lower corolla lip that is slightly shorter than the lateral lobes, obliquely erect or spreading, didynamous, long exserted (2–3 times the corolla) stamens, pollen of the *Paederota* type and a style that is 2–3 times as long as the corolla.

2025. **Pusalkar, P.K. & Singh, D.K. 2004a.** "*Ranunculus uttaranchalensis* (Ranunculaceae): A new species from Western Himalaya, India". *Nordic J. Bot.* 24(4): 403–405.

Abstract: A new species of the genus *Ranunculus, R. uttaranchalensis*, is described from Gangotri National Park, Uttaranchal in Western Himalaya, India. It is distinguished from the closely allied *R. lobatus* in having radical leaves sub cordate with hairy lamina base and petiole hairy above; cauline leaves sessile, 3–7 lobed with linear to narrowly lanceolate lobes; sepals usually reddish brown, externally hairy; petals rounded obovate and oblong, receptacle glabrous except 1–3 hairs at the top.

2026. **Pusalkar, P.K. & Singh, D.K. 2004b.** "*Waldheimia huegelii* (Sch. Bip.) Tzvelev: A new record for India, with a note on the nomenclature of the genus". *Rheedea* 14(1): 51–54.

Abstract: *Waldheimia huegelii* (Sch. Bip.) Tzvelev (Asteraceae-Anthemideae) is reported first time from India. It occurs in gangotri *National* park in Uttarkashi district of Uttaranchal. The species differs from its closely allied *W. glabra* in having dense woolly tomentum on leaves and peduncles and very short pappus with dilated tips.

2027. **Pusalkar, P.K. & Singh, D.K. 2009a.** "*Impatiens harae* var. *micrantha* (Balsaminaceae)– A new record for Indian flora". *Ann. Forest.* 17(1): 113–116.

Abstract: *Impatiens harae* H. Ohba & S. Akiyama var. *micrantha* (Haea) H. Ohba & S. Akiyama (Balsaminaceae) is reported as a new record for Indian flora from Rungling forest, Pithoragarh, Uttarakhand.

2028. **Pusalkar, P.K. & Singh, D.K. 2009b.** "Newly recorded taxa in Uttarakhand flora". *Ann. Forest.* 17(2): 261–265.

Abstract: Five taxa, comprising four species and one sub-species of angiosperms, viz., *Cremathodium ellisii* (Hook.f.) Kitam. (Asteraceae), *Thlaspi kotschyanum* Boiss. & Hohen. (Brassicaceae), *Herniaria cachemiriana* Gay (Caryophyllaceae), *Asperula oppositifolia* Reg. & Schmalh. subsp. *grandiflora* Ehrenb. (Rubiaceae) and *Veronica stewartii* Pennell (Scrophulariaceae) are reported as new records for the flora of Uttarakhand.

2029. **Pusalkar, P.K. & Singh, D.K. (2008) 2009c.** "A new species of *Berchemia* Neck. ex DC. (Rhamnaceae) from India". *Bull. Bot. Surv. India* 50(1-4): 9–12.

Abstract: A new species of *Berchemia* Neck. ex DC. (Rhamnaceae) viz., *B. jainiana* allied to *B. floribunda* (Wall.) Brongn. is described and illustrated from Phata-Gaurikund, Garhwal, Uttarakhand, India.

2030. **Pusalkar, P.K. & Singh, D.K 2009d.** "*Saussurea foresttii* (Asteraceae)– A new record for Indian flora". *Rheedea* 19(1&2): 61–63.

Abstract: *Saussurea forrestii* Diels (Asteraceae) is reported as a new record for Indian flora from the Western (Uttarakhand) Himalaya. A detailed description, illustration and relevant notes are provided for easy identification.

2031. **Pusalkar, P.K. & Singh, D.K. 2009e.** "A new *Corydalis* (Fumariaceae) from Western Himalaya, India". *Taiwania* 54(4): 334–337.

Abstract: A new species of *Corydalis* (Fumariaceae), *C. kedarensis* Pusalkar & D. K. Singh is described and illustrated from Bhoj Kharak slopes, on way to Kedarkharak, Gangotri National Park, Uttarkashi district, Uttarakhand, Western Himalaya, India. Novelty is allied to *C. govaniana* Wall., but differs in many important morphological characters of habit, cauline leaves, bracteole, pedicel, petal, spur and capsule. A table to distinguish the novelty from allied species along with the comments on other allied species is provided.

2032. **Pusalkar, P.K. & Singh, D.K. 2010a.** "New plant records from western Himalaya". *Ann. Forest.* 18(1): 55–62.

Abstract: Five taxa, viz., *Cotinus coggygria* Scop. var. *glaucophylla* C.Y. Wu (Anacardiaceae), *Stellaria congestiflora* H. Hara (Caryophyllaceae), *Sinocrassula indica* (Decne.) A. Berger var. *viridiflora* K.T. Fu (Crassulaceae), *Thalictrum alpinum* L. var. *elatum* Ulbr. (Ranunculaceae) and *Lagotis kunawurensis* (Royle ex Benth.) Rupr. var. *sikkimensis* (Hook.f.) T. Yamaz. (Selaginaceae), are reported as new records for the flora of Indian Western Himalaya. Of these, *Cotinus coggygria* var. *glaucophylla* from Jammu & Kashmir, Himachal Pradesh & Uttarakhand and *Sinocrassula indica* var. *viridiflora* from Himachal Pradesh & Uttarakhand are new records for the flora of India as well.

2033. **Pusalkar, P.K. & Singh, D.K. 2010b.** "A new variety and a new record of *Corydalis* DC. (Fumariaceae) from Western Himalaya, India". *Indian J. Forest.* 33(2): 193–198.

Abstract: A new variety, *Corydalis vaginans* Royle var. *jadagangensis* Pusalkar & D.K. Singh is described and illustrated from the Gangotri National Park, Uttarkashi district of Uttarakhand, Western Himalaya along with the report of *Corydalis govaniana* Wall. var. *swatensis* (Kitam.) Jafri, as a new record for Indian flora from Pauri district, Uttarakhand.

2034. **Pusalkar, P.K. & Singh, D.K. 2010c.** "*Sageretia santapaui sp. novo* and *Sageretia devendrae sp. novo* (Rhamnaceae) from Western Himalaya, India". *Nordic J. Bot.* 28: 49–53.

Abstract: Two new species of *Sageretia* Brongn. (Rhamnaceae), *S. santapaui* Pusalkar & D. K. Singh and *S. devendrae* Pusalkar, are described and illustrated. Both species are allied to *S. thea* (Osbeck) M. C. Johnst., but differs in the pubescence of young branches, leaf shape, leaf margins, stipule shape, inflorescence type, length of the inflorescence, number and arrangement of flowers, bracteole number and shape.

2035. **Pusalkar, P.K. & Singh, D.K. 2010d.** "Three new species of *Impatiens* (Balsaminaceae) from Western Himalaya, India". *Taiwania 55*(1): 13–23.

Abstract: Three new species of *Impatiens* (Balsaminaceae), viz., *I. badrinathii* Pusalkar & D.K. Singh from Mana-Vasudhara, Upper Alkananda valley, Uttarakhand, *I. leggei* Pusalkar & D.K. Singh from Ghangaria, near Valley of Flowers National Park entrance, Chamoli district, Uttarakhand and *I. devendrae* Pusalkar from On way to Ghangaria, Chamoli district, Uttarakhand are described and illustrated for the Western Himalaya, India.

2036. **Pusalkar, P.K. & Singh, D.K. 2011a.** "A note on Western Himalayan endemic *Trisetum micans* (Hook.f.) Bor [Poaceae]". *Ann. Forest.* 19(1): 105–108.

Abstract: *Trisetum micans* (Hook.f.) Bor, a rare, endemic grass of the Western Himalaya, is reported from the Gangotri National Park, Uttarkashi district, Uttarakhand, after a span of more than a half century with a note on newly recorded extended western distribution of the species, up to Pakistan.

2037. **Pusalkar, P.K. & Singh, D.K. (2010) 2011b.** "Status of *Corydalis meifolia* var. *violacea* [Fumariaceae] and a new varietal record for India". *Nelumbo* 52(1-4): 138–143.

Abstract: A new variety of *Corydalis meifolia* viz., *C. meifolia* var. *ecristata* C.Y. Wu & Z.Y. Su, hitherto known from China, has recorded for the first time for India from Chamoli district, Uttarakhand. A detailed morpho-taxonomic study on the fresh collection from Gangotri National Park, Western Himalaya along with the type specimens of *Corydalis meifolia* var. *violacea* from different herbaria revealed that this varietyat the species rank, the same is raised here at the species rank.

2038. **Pusalkar, P.K. & Singh, D.K. 2011c.** "Naming common Himalayan *Paraquilegia* J.R. Drumm. & Hutch. (Ranunculaceae)". *Nelumbo* 53: 221–227.

Abstract: *Paraquilegia gangotriana* Pusalkar & D.K. Singh allied to *P. microphyllum* (Royle) J.R. Drumm. & Hutch. has been described and illustrated from Phulaldaru in Nila valley, Tehri Garhwal (presently Uttarkashi ditrict), Uttarakhand. Author citation, types, icons, distribution and notes of all 6 species of *Paraquilegia* is also given.

2039. **Pusalkar, P.K. & Singh, D.K. 2013a.** "*Saxifraga lepida* Harry Sm. (Saxifragaceae)– A new record for Indian flora". *Ann. Forest.* 21(1): 85–87.

Abstract: *Saxifraga lepida* Harry Sm. (Saxifragaceae) is described and illustrated from Furkia-Dwali, Pindar valley, Bageshwar district, Uttarakhand (Kumaon) Himalaya as new record for Indian flora.

2040. **Pusalkar, P.K. & Singh, D.K. 2013b.** "Noteworthy plant records from western Himalaya". *Ann. Forest.* 21(2): 213–218.

Abstract: *Leontopodium souliei* Beauv. (Asteraceae) is reported as a new record for Indian flora. *Aphragmus obscures* (Dunn) O.E. Schulz (Brassicaceae) and *Chenopodium karoi* (Murr) Aellen (Chenopodiaceae) are reported as new records for the flora of Uttarakhand. Two rare species, *Corydalis lathyroides* Prain (Fumariaceae) and *Sibbaldianthe adpressa* (Bunge) Juz. (Rosaceae) are recorded in India after a span of more than half a century with new locality reports.

2041. **Pusalkar, P.K. & Srivastava, S.K. 2014.** "*Carpesium cordatum* F.H. Chen & C.M. Hu (Asteraceae)– A new record for Indian flora". *Ann. Forest.* 22(2): 207–209.

Abstract: *Carpesium cordatum* F.H. Chen & C.M. Hu (Asteraceae) is reported here as a new record for Indian flora from new record for Indian flora from Uttarakhand.

2042. **Pusalkar, P.K. & Srivastava, S.K. 2015a.** "*Cirsium arvense* L. var. *alpestre* Nageli (Asteraceae)–A new record for Indian flora". *Indian J. Forest.* 38(1): 75–76.

Abstract: *Cirsium arvense* L. var. *alpestre* Nageli (Asteraceae) is reported here as a new record for Indian flora from Jammu & Kashmir, Haryana, Himachal Pradesh, Punjab, Uttarakhand and Uttar Pradesh.

2043. **Pusalkar, P.K. & Srivastava, S.K. 2015b.** "*Stellaria devendrae sp. nov.* (Caryophyllaceae) from Western Himalaya, India". *Nordic J. Bot.* 33(4): 385–388.

Abstract: *Stellaria devendrae* sp. nov. (Caryophyllaceae) is here described and illustrated from the Uttarakhand state of the Indian western Himalaya. It differs from the allied *S. monosperma* Buch. Ham. ex D. Don and *S. paniculata* Edgew. in having sub sessile, oblanceolate or obovate leaves with non amplexicaul, rounded to sub auricled leaf base; an inflorescence of a terminal, regularly and simply branched panicle of cymes; larger flowers (5–8 mm across); 5 lobed floral disc; relatively larger sepals (4–7 mm long); petal lamina lobed for more than 1/2 to 4/5 of the lamina; filaments opposite sepals with prominent nectar glands at base; adjoining filaments not fused at base, and an inconspicuously reticulate papillate seed surface.

2044. **Pusalkar, P.K. & Srivastava, S.K. (2014) 2015c.** "Two new records for Indian flora". *Phytotaxonomy* 14: 150–151.

Abstract: *Galium boreale* L. var. *ciliatum* Nakai and *Galium borealis* var. *intermedium* DC. (Rubiaceae) are reported here as new records for Indian flora from Tehri, Uttarakhand and Jammu & Kashmir, respectively. Key is appended for easy identification of different varieties of *G. Boreale* reported from India.

2045. **Pusalkar, P.K. & Srivastava, S.K. 2016.** "Breaking point endemism of *Ranunculus bikramii* Aswal & Mehrotra (Ranunculaceae)– New locality reports from Jammu & Kashmir, Himachal Pradesh and Uttarakhand". *Indian J. Forest.* 39(3): 263–265.

Abstract: *Ranunculus bikramii* Aswal & Mehrotra (Ranunculaceae), a point endemic species from Rohtang pass, Lahul-Spiti district, Himachal Pradesh is reported here as new record for the flora of Uttarakhand and Jammu & Kashmir. Furthermore, additional distributional localities in Himachal Pradesh are also provided recording wider distribution range with locally common occurrence for this Western Himalayan endemic species.

2046. **Pusalkar, P.K. & Srivastava, S.K. (2016) 2017.** "*Ranunculus hirtellus* var. *humilis* W.T. Wang– A new record for Indian flora". *Phytotaxonomy* 16: 21–22.

Abstract: *Ranunculus hirtellus* Royle var. *humilis* W.T. Wang (Ranunculaceae) is reported as a new record for Indian flora from Jammu & Kashmir and Uttarakhand, Western Himalaya.

2047. **Pusalkar, P.K., Singh, D.K. & Lakshminarasimhan, P. 2004.** "*Silene gangotriana* (Caryophyllaceae): A new species from Western Himalaya, India". *Kew Bull.* 59(4): 621–624.

Abstract: A new species of the genus *Silene* L., *S. gangotriana* Pusalkar, Singh & Lakshmin. from Gangotri National Park, Uttaranchal, India, is described and illustrated.

2048. **Pusalkar, P.K., Singh, D.K. & Srivastava, S.K. 2008.** "*Elymus gangotrianus* [Poaceae: Pooideae: Triticeae], a new species from Western Himalaya, India". *Kew Bull.* 63(3): 507–509.

Abstract: A new species of *Elymus* L., *E. gnngotrianus* Pusalkar, D. K. Singh & S. K. Srivast., is described from Gangotri National Park, Uttaranchal, India. The species differs from the closely allied *E. microlepis* (Melderis) Melderis in having longer spikelets, green or creamy-yellow lemma, with scabrid outer surface; palea ¾ the length of lemma; palea keels glabrous below, scabrous above and yellow or creamy anthers.

2049. **Pusalkar, P.K., Singh, D.K. & Srivastva, S.K. 2012.** "New plant records from Uttarakhand with a note on *Arenaria kumaonensis* Maxim. (Caryophyllaceae)". *Indian J. Forest.* 35(1): 107–114.

Abstract: Six taxa, viz., *Anemone obtusiloba* D. Don var. *potentilloides* Lauener, *Eriocapitella rupicola* (Cambess.) Pusalkar, D.K. Singh & S.K. Srivast. var. *glabriuscula* (Hook.f.) Pusalkar, D.K. Singh & S.K. Srivast. (Ranunculaceae), *Ilex excelsa* (Wall.) Hook.f. var. *hypotricha* (Loesener) S.Y. Hu (Aquifoliaceae), *Paeonia emodi* Wall. ex Royle var. *glabrata* Hook.f. & Thomson (Ranunculaceae), *Parrya nudicaulis* (L.) Regael (Brassicaceae) and *Ranunculus histellus* Royle var. *orientalis* W.T. Wang (Ranunculaceae) are reported as new records for Uttarakhand flora. Of these, *Ranunculus histellus* var. *orientalis* W.T. Wang is a new record for Indian flora and *Lex excelsa* var. *hypotricha* (Loesener) S.Y. Hu is a new record for the Western Himalayan flora as well. A new combination is proposed under the genus *Eriocapitella* Nakai (Ranunculaceae) and a note is appended on status, morpho-taxonomy and distribution of widely mis-understood species *Arenaria kumaonensis* Maxim. (Caryophyllaceae).

2050. **Pusalkar, P.K., Singh, D.K. & Srivastava, S.K. 2014.** "New and noteworthy plant records in Western Himalayan flora". *Ann. Forest.* 22(1): 49–56.

Abstract: *Solidago dahurica* (Kitag.) Kitag. ex Juz. (Asteraceae) is recorded as a new record for Indian flora from Himachal Pradesh. *Corydalis stracheyi* var. *ecristata* Prain (Papaveraceae-Fumarioideae), *Drymaria villosa* Cham. & Schlecht. Caryophyllaceae) and *Juncus allioides* Franch. (Juncaceae) are reported as new records for Western Himalayan flora. Eastward extension in distributional limit of *Corydalis stracheyi* Duthie ex Prain (Papaveraceae-Fumarioideae) is reported from Himachal Pradesh, forming a new record for the state flora. Similarly, *Juncus allioides* Franch. and *J. bufonius* L. var. *congestus* Wahlenb. (Juncaceae) are recorded as additions to the state flora of Himachal Pradesh and Uttarakhand. Additionally, the presence of hitherto believed Chinese endemic *Corydalis adunca* Maxim. (Papaveraceae-Fumarioideae) in Indian flora is also confirmed.

2051. **Pusalkar, P.K., Kukreti, P., Singh, D.K. & Gaur, R.D. 2004a.** "Some new plant records from Western Himalaya". *Ann. Forest.* 12(1): 116–118.

Abstract: Three dicotyledonous taxa, viz. *Epilobium brevifolium* D. Don subsp. *trichoneurum* (Hausskn.) Raven, *Potentilla eriocarpa* Wallich ex Lehm. var. *tsarongensis* Evans and *Pegaeophyton minutum* Hara have been reported for the first time in the flora of Uttaranchal. This also constitutes their first record from the Western Himalayan biogeographic zone of the country.

2052. **Pusalkar, P.K., Kukreti, P., Singh, D.K. & Gaur, R.D. 2004b.** "Additions to the flora of Uttaranchal". *Indian J. Forest.* 27(4): 404–406.

Abstract: Seven taxa of flowering plants, viz., *Ranunculus stewartii* H. Riedl. (Ranunculaceae), *Corydalis murreeana* Jafri (Fumariaceae), *Potentilla polychista* Boiss. & Hohen. (Rosaceae), *Cirsium wallichii* DC. var. *glabratum* (Hook.f.) Wendelbo, *Leontopodium alpinum* Cass. subsp. *alpinum* (Asteraceae), *Euphrasia foliosa* Pennell and *Veronica salina* Schur. (Scrophulariaceae) have been recorded for the first time from Uttaranchal.

2053. **Pusalkar, P.K., Kukreti, P., Uniyal, B.P. & Singh, D.K. 2002.** "Species hitherto unknown to Uttaranchal flora". *Indian J. Forest.* 25(4): 479–480.

Abstract: Four taxa of flowering plants, viz., *Aquilegia nivalis* (Baker) Bruehl, *Ranunculus palmatifidus* H. Riedl (Ranunculaceae), *Herniaria incana* Lam. (Caryophyllaceae) and *Polygonum polystachyum* Wallich ex Meissn. var. *griffithii* Hook.f. (Polygonaceae) have been recorded for the first time from Uttaranchal. Of these, *Polygonum polystachyum* Wallich ex Meissn. var. *griffithii* Hook.f. is a new record for Northwest Himalaya as well.

2054. **Pusalkar, P.K., Singh, D.K., Lakshminarasimhan, P. & Singh, S. 2005.** "*Salvia reflexa* Hornem. (Lamiaceae)– A new record for India". *Bull. Bot. Surv. India* 47(1-4): 153–154.

Abstract: A north and central American weed, *Salvia reflexa* Hornem., hitherto unknown in Indian flora has been recorded from Jageshwar-Almora road, Almora, Uttaranchal.

2055. **Rai, I.D. & Adhikari, B.S. 2012.** "*Rhododendron rawatii* (Ericaceae), a new species from the Western Himalaya, India". *Phytotaxa* 71(1): 10–16.

Abstract: A new species of *Rhododendron, R. rawatii* is illustrated and described from the Western Himalaya. The species is sporadically found in the subalpine–timberline zone of Uttarakhand state. Fascicled white cottony hairs on the abaxial surface in between lateral veins of leaves, bright pink and shine-less corolla and comparatively large calyx with hairy margins distinguish the new species from its nearest ally *R. fulgens*. The populations of the species were found in two geographically distinct localities in the Rudraprayag and Pithoragarh districts of Uttarakhand state. The distinguishing morphological characters, affinities with other species and various ecological aspects of the new species are discussed here.

2056. **Rai, I.D., Adhikari, B.S. & Rawat, G.S. 2014.** "A rare and endangered root parasite: *Balanophora inolucrata* Hook.f. & Thomson". *Indian Forester* 140(4): 435–436.

Abstract: A rare and endangered root parasite, *Balanophora inolucrata* Hook.f. & Thomson has been reported from Tungnath and Patyuri in Kedarnath Wildlife Sanctuary.

2057. **Rai, I.D., Singh, G. & Rawat, G.S. 2013.** "*Bistorta tenuifolia* var. *gidarensis* (Polygonaceae), a new variety from India". *Phytotaxa* 92(1): 13–19.

Abstract: During a botanical excursion of the alpine meadows in the state of Uttarakhand, we came across a viviparous species under the genus *Bistorta* (Polygonaceae). Subsequently, the taxon was also recorded from the Great Himalayan National Park, Himachal Pradesh. The gross morphology suggested this plant belong to *B. tenuifolia* but we found differences in the shape of perianth lobe and the size of stamens from those of the typical *B. tenuifolia*. On the basis of the acute perianth lobes, the minute stamens that are included in the perianth and the reniform anthers, we describe a new variety, *B. tenuifolia var. gidarensis* from Gidara alpine meadow, Uttarkashi district, Uttarakhand and compared it with the nominal variety and the related species *B. vivipara.*

2058. **Rai, I.D., Singh, G. & Rawat, G.S. 2015.** "Rediscovery, distribution and conservation status of *Leptodermis riparia* R. Parker (Rubiaceae) in Western Himalaya, India". *Telopea* 18: 79–83.

Abstract: *Leptodermis riparia* R. Parker (Rubiaceae) is rediscovered after a gap of 90 years from its type locality in the eastern part of Uttarakhand, Western Himalaya. Recent field studies have found two additional localities for this species in the state. All three populations were found in the riparian zone especially on rocky substrate rich in limestone. We observed that the type locality of this species has been severely eroded due to a major flash flood in Kali river during 2013. In this article, we present a description, habitat characteristics, known distribution, and conservation status of *L. riparia* in the Western Himalaya.

2059. **Rai, I.D., Singh, G. & Rawat, G.S. 2016.** "Noteworthy additions to the flora of Uttarakhand, western Himalaya, India". *J Threatened Taxa* 8(7): 9004–9008.

Abstract: During recent botanical explorations, we recorded three interesting plant species from the alpine regions (>3500m) of the Uttarakhand State in the western Himalaya. After a detailed scrutiny of the literature and herbarium specimens, we ascertain their identity and report them as additions to the flora of Uttarakhand. In this paper descriptions of these species along with their phenology, distribution, photographs, ecology and phytogeographical notes have been presented.

2060. **Rai, I.D., Jalal, J.S., Singh, G. & Kumar, P. 2015.** "A note on the occurrence of *Eulophia flava* (Lindl.) Hook.f. (Orchidaceae) in Kumaon Himalaya". *Indian J. Forest.* 38(3): 263–264.

Abstract: *Eulophia flava* (Lindl.) Hook.f. is collected after a gap of 150 yaers from Kathikhark, Champawat district of Kumaun Himalaya.

2061. **Rai, I.D., Jalal, J.S., Singh, G. & Rawat, G.S. 2014.** "*Platanthera pachycaulon* (Orchidaceae): An addition to the orchid flora of Western Himalaya, India". *Ricardiana* 14(9): 266–273.

Abstract: *Platanthera pachycaulon* (Hook.f.) Soó is reported for the first time from Western Himalaya. Its detailed description supplemented by a photograph, illustration and information about the habitat, as well as about the phenology and distribution of the species is provided. An artificial key to all taxa belonging to the genus *Platanthera* in western Himalaya is also provided.

2062. **Rai, I.D., Jalal, J.S., Singh, G. & Rawat, G.S. 2015.** "Extended distribution of *Platanthera cumminsiana* (King and Pantl.) J. Renz (Orchidaceae) in Western Himalaya, India". *Indian J. Forest.* 38(1): 95–98.

Abstract: *Platanthera cumminsiana* (King and Pantl.) J. Renz is reported here for the first time for Western Himalaya from Patyuri, Rudraprayag district (Kedarnath Wildlife Sanctuary), Uttarakhand. Previously this species was reported from Sikkim and Arunachal Pradesh.

2063. **Rai, I.D., Kumar, A., Singh, G., Adhikari, B.S. & Rawat, G.S. 2017.** "Three noteworthy additions to the flora of the western Himalaya, India". *J Threatened Taxa* 9(7):10421–10425.

Abstract: During recent botanical explorations in the western Himalaya, three interesting species viz., *Anemone demissa* Hook.f. & Thomson (Ranunculaceae), *Scrophularia pauciflora* Benth. (Scrophuriaceae) and *Anthoxanthum flexuosum* (Hook.f.) Veldkamp (Poaceae) were recorded from the subalpine-alpine areas, which were hitherto unknown from this region. Their occurrence in this region is phytogeographically significant and noteworthy. In this paper a brief description of these species along with phenology, distribution, ecology, photographs and phytogeographical notes are provided.

2064. **Rai, I.D., Kumar, P., Bharat, R.R., Adhikari, B.S. & Rawat, G.S. 2010.** "*Corallorhiza trifida* Chatel.: A little known partial myco-heterotrophic orchid from the Valley of Flowers National Park, Western Himalaya, India". *Taiwania* 55(4): 391–395.

Abstract: A small population of *Corallorhiza trifida* Chatel., a partial myco-heterotrophic orchid was recorded from the state of Uttarakhand after a gap of over 50 years. In this article we present an update on its systematics (nomenclature, morphology, phytogeography), ecology and aspects of conservation.

2065. **Raizada, M.B. 1934.** "New or little known plants from Kumaon". *Indian Forester* 60(3): 229–238.

2066. **Raizada, M.B. 1935.** "Recently introduced or otherwise imperfectly known plants from the upper Gangetic plain". *J. Indian Bot. Soc.* 14: 339–348.

2067. **Raizada, M.B. 1936.** "Recently introduced or otherwise imperfectly known plants from the Upper Gangetic plain". *J. Indian Bot. Soc.* 15: 149–167.

2068. **Raizada, M.B. 1939.** "Recently introduced or otherwise imperfectly known plants from the Upper Gangetic plain". *Indian Forest Res. (N.S.) Bot.* 1(5): 223–236 or 2: 223–235.

2069. **Raizada, M.B. 1941.** "New or little known plants from Kumaon". *Indian Forester* 67(1): 15–23.

Abstract: In the present paper seventeen species have been recorded for the first time for Kumaon.

2070. **Raizada, M.B. 1950.** "New or noteworthy plants from the Upper Gangetic plain". *Indian Forester* 76(11): 489–497.

Abstract: A number of new or noteworthy plants from the Upper Gangetic Plain are described. This part, together with three already published, forms a useful supplement of Duthie's Flora of Upper Gangetic Plain. For the benefit of those who may use this list, detailed descriptions are given on those plants which are not found in Hooker's Flora of Bristish India. 35 species belonging to 32 genera and 20 families are enumerated in the present paper.

2071. **Raizada, M.B. 1951.** "New or noteworthy plants from the Upper Gangetic plain". *Indian Forest Rec. (Bot.)* 4(3): 65–72.

2072. **Raizada, M.B. 1958.** "New or noteworthy plants from the Upper Gangetic plain". *Proc. Natl. Inst. Sci., India* 24: 198–204.

2073. **Raizada, M.B. & Saxena, H.O. 1962.** "New plant records for North and North West India". *Indian Forester* 88(9): 702–703.

Abstract: Some interesting plants viz., *Salomonia cantoniensis* Lour., *S. ciliata* (L.) DC., *Osbeckia truncata* D. Don, *Stylidium tenellum* Sw., *Swertia nervosa* Wall. ex Griseb., *Utricularia wallichiana* Wight var. *wallichiana* and *Scleria caricina* (R. Br.) Benth. has been collected from Mussoorie and Rajpur Hills, Dehra Dun. The occurrence of two genera, *Salomonia* and *Stylidium* is of particular interest as no species of these genera have so far been reported in literature to occur in North-West India.

2074. **Raizada, M.B., Arora, C.M. & Prasad, R. 1978.** "New or little known plants from Kumaon". *Indian J. Forest.* 1(1): 31–34.

Abstract: In the present paper 24 species belonging to 16 families turned out to be new records for Kumaon Himalaya.

2075. **Rajagopal, T. 1965.** "New records of species for 'Flora of Allahabad'". *Proc. Natl. Acad. Sci. India,* Sec. B. 35: 24–45.

2076. **Rajagopal, T. & Panigrahi, G. 1966.** "New records of species for 'Flora of Allahabad -II'. *Proc. Natl. Acad. Sci. India,* Sec. B. 36: 57–84.

2077. **Rajwar, G.S. 1978.** "*Cestrum aurantiacum* Lindl.– A new record for Garhwal". *Indian J. Forest.* 1(2): 165.

Abstract: *Cestrum aurantiacum* Lindl. has been recorded for the first time for Garhwal from Lansdowne, Pauri Garhwal.

2078. **Rajwar, G.S. 1983.** "New plant records for Garhwal Himalaya- II". *Indian J. Forest.* 6(3): 235. Abstract: Sixteen species has been reported for the Flora of Garhwal Himalaya from Pauri Garhwal district.

2079. **Rana, C.S. & Rawat, D.S. 2012.** "New floral distribution records of *Aquilegia nivalis* (Baker) Falc. ex B.D. Jacks. and *Doronicum falconeri* C.B. Clarke ex Hook. f. from the Valley of Flowers National Park, Uttarakhand, India". *J. Threatened Taxa* 4(9): 2911–2914.

Abstract: During our study of the high altitude threatened alpine plant species *Aquilegia nivalis* Falc. ex Baker and *Doronicum falconeri* Cl. ex Hk. f. of the north-west Himalaya, some specimens were obtained from Garhwal and Pantnagar University, Uttarakhand State. On comparison with authentic specimens at CAL, DD and BSD herbaria and literature survey revealed that the aforesaid plant species have never been recorded earlier from the Valley of Flowers National Park. In this communication, a detailed taxonomic description, with an up to date nomenclature, distribution and specimens examined is presented.

2080. **Rana, C.S., Rana, V. & Bisht, M.P.S. 2011.** "New distributional record of *Gentiana tetrasepala* Biswas (Gentianales: Gentianaceae) from the Valley of Flowers National Park, Garhwal Himalaya". *J. Threatened Taxa* 3: 2100–2103.

Abstract: *Gentiana tetrasepala* Biswas belonging to the family Gentianaceae was rediscovered by Rawat (2009) after a long gap of 123 years from Garhwal Himalaya. In our investigation of the climatic and glacial variation within Valley of Flowers National Park (VoFNP), *Gentiana tetrasepala* Biswas was recorded for the first time. The Valley of Flowers, a world Heritage site situated in the alpine meadows of district Chamoli in

the state Uttarakhand. Recording of *G. tetrasepala* Biswas an alpine herb from VoFNP is good indication although, due to recent climatic and glacial variation the habitat of the species might be replace cause overlapping and vegetational adjustment in the form of upward shifting. In the present communication the manuscript deals *G. tetrasepala* conservation and probability of being disappearance along with valid taxonomical description for future reference, which will be useful to the botanist and environmentalist.

2081. **Rana, C.S., Rawat, D.S., Tiwari, J.K. & Dangwal, L.R. 2018.** "*Aeginetia indica* L. var. *alba* Santapau (Orobanchaceae) and *Scutellaria discolor* Colebr. (Lamiaceae): New additions to the flora of Garhwal Himalaya, Uttarakhand". *J. Mountain Res.* 13: 15–19.

Abstract: Updation of the floristic inventories at the regional scale through new discoveries and new distributional records is a necessary prerequisite to assess the conservation status of plant species. The present account communicates new distributional record of *Aeginetia indica* L. var. *alba* Santapau (Orobanchaceae) and *Scutellaria discolor* Colebr. (Lamiaceae) from Garhwal Himalaya. A brief description based on field characters, phenology, local distribution and figures has been provided for easy identification.

2082. **Rana, T.S., Datt, B. & Nair, K.N. 2005.** "Himalayan Caper [*Capparis spinosa* L. var. *himalayensis* (Jafri) Jacobs]: A botanically curious plant". *Phytotaxonomy* 5: 73–75.

Abstract: The present paper highlights various aspects of the Himalayan Caper based on a study carried out by the authors during their field trips to various parts of the Himalayan region.

2083. **Rao, A.S. 1981.** "Taxonomic notes on *Mahonia Jaunsarensis* Ahrendt.". *Indian J. Forest.* 4(3): 243–244.

Abstract: In the present communication the detailed description of flower and fruits of *Mahonia Jaunsarensis* Ahrendt. has been given, along with other notes which was collected recently from the Chakrata. Ahrendt described this species (leaf, short reference of inflorescence, bracts and immature fruit) only on the basis of the material collected from Chakrata by Rich, Marshall and Nand.

2084. **Rao, A.S. & Murti, S.K. 1980.** "*Cyperus sulcinux* C.B. Clarke– A new record from Kumaon Himalaya". *Indian Forester* 106(10): 703.

Abstract: *Cyperus sulcinux* C.B. Clarke, a generally widespread species, but rare and confined to small pockets within this range of distribution, and hitherto unknown from the Kumaun Himalaya is here recorded for the first time and briefly described.

2085. **Rao, R.R. 1984.** "*Modiola caroliniana* (L.) G. Don (Malvaceae)– New record for India". *J. Econ. Taxon. Bot.* 5(4): 907–908.

Abstract: *Modiola caroliniana* (L.) G. Don is reported here as a new generic and species record for India from Chakrata, Western Himalaya.

2086. **Rao, T.A. 1961.** "An imperfectly known endemic taxon of Kumaon Himalayas– *Falconeria himalaica* Hook. f. = *Wulfenia himalaica* (Hook. f.) Pennell". *Bull. Bot. Surv. India* 3(1): 75–77.

Abstract: During a botanical exploration in the Kumaon Himalayas complete specimens of *Falconeria himalaica* Hook.f. were collected at Kalamuni pass at an altitude of 3000 m. The rediscovery of this taxon is of interest because of its incomplete description and dubious systematic position. The present paper gives a detailed taxonomic description of this taxon.

2087. **Rau, M.A. 1961.** "Occurrence of *Alectra parasitica* A. Rich. in India– A new variety from Banda district, U.P.". *Bull. Bot. Surv. India* 3(1): 25–27.

Abstract: *Alectra parasitica* A. Rich., with a wide distribution in Eastern & North-Eastern Africa but hitherto not recorded from this country has new been collected in the Banda district of Uttar Pradesh. Since the Indian plant differs from the African specimens in the strongly rhizomatous development of the underground parts of the stem, it has been described as a new variety and is named *A. parasitica* A. Rich. Var. *chitrakutensis* M.A. Rau, var. nov.

2088. **Rau, M.A. & Arora, C.M. 1973.** "On the occurrence of *Diplomeris hirsuta* Lindl. (Orchidaceae) in Western Himalaya". *Bull. Bot. Surv. India* 15(1&2): 138–139.

Abstract: *Diplomeris hirsuta* Lindl. has been reported for the first time for Western Himalaya from Kathgodam to Nainital road (79Ú33'E longitude & 29Ú18'N Latitude).

2089. **Rau, M.A. & Bhattacharyya, U.C. 1966.** "New records of three rare orchids for Western Himalaya". *Bull. Bot. Surv. India* 8(1): 93–94.

Abstract: The paper records the finding of *Bulbophyllum triste* Reichb.f. from Askot region of Kumaun Himalaya, *Listera longicaulis* King & Pantl. and *Didiciea cunninghamii* King & Prain from Gangharea forest in Garhwal Himalaya for the first time in the localities of Western Himalaya.

2090. **Rau, M.A. & Rao, T.A. 1959.** "Some plant records". *Bull. Bot. Surv. India* 1: 142–143.

Abstract: In the course of exploration of the Northern States of the country, the authors visited some parts of the Punjab, Garhwal and Kumaon Himalayas and also few places of the plains of Punjab and Uttar Pradesh. During this tour, the authors collected some plants which are new records for the state. These species are *Enhydra fluctuans* Lour from Rishikesh, Uttar Pradesh, *Primula pulchra* Watt from Kashmir, *Menyanthes trifoliata* L. from Chamba, Himachal Pradesh, *Alectra thomsonii* Hook.f. from Banda, Madhya Pradesh, *Elatostema cuneatum* Wight, *E. ficoides* Wedd., *E. rupestre* Wedd from Kumaon and *Corallorhiza trifida* Chatel. from Kumaon of Uttar Pradesh.

2091. **Rau, M.A. & Rao, T.A. 1960.** "Some plant records – III". *Bull. Bot. Surv. India* 2(3&4): 425–426.

Abstract: This paper records new localities for the occurrence of the following species of flowering plants: *Callianthemum rutaefolium* C.A. Mey. (Ranunculaceae) from Kashmir; *Onopordon acanthium* L. (Compositae) from Kashmir; *Flaveria australasica* Hook. (Compositae), an introduced weed now extending to Uttar Pradesh; *Cypripedium elegans* Reichb.f. (Orchidaceae) previously known only from Sikkim and East Tibet, recently recorded from Nepal and now collected in North Garhwal and *Merendera persica* Boiss. & Kotsch. (Liliaceae) from Kashmir. *Streptolirion cordifolium*

(Griff.) Kuntze, a climbing member of the Commelinaceae has been recorded from North Garhwal where it was only been infrequently collected in the past.

2092. **Rau, M.A. & Rao, T.A. 1961.** "Some plant records – IV". *Bull. Bot. Surv. India* 3(1): 29–30.

Abstract: Brief notes are given on three rare plants of the Western Himalayas, viz., *Stylophorum lactucoides* Baill. (Papaveraceae) from Garhwal Himalaya, *Triosteum hirsutum* Wall. (Caprifoliaceae) from Kumaon and Sikkim and *Epipogium tuberosum* Duthie (Orchidaceae) from Jammu & Kashmir and Himachal Pradesh (Kulu valley).

2093. **Rawat, D.S. 1997.** "*Corydalis peudo-juncea* Ludlow (Fumariaceae): A new record for India". *J. Bombay Nat. Hist. Soc.* 94(2): 434–436.

Abstract: *Corydalis peudo-juncea* Ludlow (Fumariaceae) has been reported for the first time for Indian Himalaya from Kuari Pass area, Garhwal Himalaya. Earlier this species was known only from Nepal. The recent collection is of phytogeographic interest and represents a new record from India.

2094. **Rawat, D.S. 2009.** "A presumed extinct endemic alpine herb *Gentiana tetrasepala* rediscovered after 123 years: Will it survive?'. *Natl. Acad. Sci. Letters* 32(5/6): 169–172.

Abstract: *Gentiana tetrasepala* Biswas (Gentianaceae) was collected by J.F. Duthie from Ralam valley, Kumaon in 1884 and described as new species by Biswas in 1938. After its only collection in 1884, the species has not been recollected from anywhere in the Himalaya or other parts of the world leading to the assumption that either it has become extinct or it does not hold as a valid taxonomic species. In 2007 this species was rediscovered by author from Garhwal Himalaya after a gap of 123 years, in this communication taxonomic characters of the species are described in detail with, hitherto, unknown capsules and seeds. This rediscovery establish it as an extant and valid taxonomic species. Possible threats to it are described here and it is assessed as critically endangered.

2095. **Rawat, D.S. 2015.** "New additions to the flora of Uttarakhand, India". *J. Threatened Taxa* 6(8): 6101–6107.

Abstract: Botanical explorations in different parts of Uttarakhand resulted in collection of seven angiosperm species which were not known previously from the state. These are described here with images of live plants and herbarium specimens.

2096. **Rawat, D.S. & Bhandari, B.S. 2017.** "A note on distribution of *Salvia reflexa* Hornem. (Lamiaceae) in Uttarakhand". *Phytotaxonomy* 17: 120–122.

Abstract: *Salvia reflexa* Hornem., is a weedy American annual known only from Kumaon in India and Asia. Three new populations of this species are reported from Nainital district of Uttarakhand. Being an invasive species, monitoring of its populations is suggested.

2097. **Rawat, D.S. & Chandra, S. 2014.** "Presumed extinct *Dipcadi reidii* (Asparagaceae) recollected after 127 years from Uttarakhand, India". *Rheedea* 24(1): 1–4.

Abstract: *Dipcadi reidii* Deb & S. Dasgupta was presumed extinct species in Red Data Book of Indian Plants and other literature that followed. A botanical exploration to

its type locality at Malipa, Kali valley, Eastern Kumaon (Uttarakhand) during July, 2013 resulted in its recollection after a lapse of 127 years.

2098. **Rawat, D.S. & Gaur, R.D. 1996.** "On the occurrence of *Gentiana infelix* Clarke (Gentianaceae) in Garhwal Himalayas". *J. Bombay Nat. Hist. Soc.* 93(1): 118–119.

Abstract: *Gentiana infelix* Clarke has been reported from Kedarnath area after about 150 years from the region of Kumaun and Garhwal and except the type specimens only two collections are known from India.

2099. **Rawat, D.S. & Gaur, R.D. 1997.** "Sun-tracking in *Ranunculus hirtellus* Royle ex D. Don". *J. Bombay Nat. Hist. Soc.* 94(1): 181–184.

Abstract: The first report of heliotropism in *Ranunculus hirtellus* Royle ex D. Don has been observed from glacial valley of Kedarnath (3560 m above msl), Garhwal Himalaya.

2100. **Rawat, D.S. & Gaur, R.D. 1999.** "On the occurrence of *Utricularia brachiata* Oliver (Lentibulariaceae) in Garhwal Himalaya". *J. Bombay Nat. Hist. Soc.* 96(3): 496–498.

Abstract: *Utricularia brachiata* Oliver, an endemic species of eastern Himalaya has been reported here for the first time for Garhwal Himalaya from Rudranath alpine zone, Chamoli district.

2101. **Rawat, D.S. & Rana, C.S. 2007.** "*Arenaria curvifolia* Majumdar (Caryophyllaceae): An endangered and endemic Himalayan herb rediscovered". *Curr. Sci.* 92: 1486–1488.

Abstract: *Arenaria curvifolia* Majumdar is one of the endemic species of the alpine zone of Garhwal Himalaya rediscovered from an alpine slope near Kuari Pass, Chamoli district after a gap of 121 years. The species was described in 1980 on the basis of three old specimens collected by J.F. Duthie in 1885.

2102. **Rawat, D.S., Dangwal, L.R & Gaur, R.D. 1992.** "Further additions to the aquatic flora of Chamoli district". *J. Econ. Taxon. Bot.* 16(3): 731–732.

Abstract: *Potamogeton nodosus* Poir. and *P. octandrus* Poir. Has been collected for the first time for Chamoli district from Beni Tal lake.

2103. **Rawat, D.S., Dangwal, L.R. & Gaur, R.D. 1994.** "Some interesting plant records from Garhwal Himalaya". *J. Bombay Nat. Hist. Soc.* 91(1): 168–169.

Abstract: Some interesting plants species, viz., *Corydalis elegans* Wall. ex Hook.f. & Thomson, *saussurea candolleana* Wall. ex Hook.f., *Thalictrum punduanum* Wall. var. *glaucum* Hook.f. et Thomson, *Tussilago farfara* L., *Thlaspi andersonii* (Hook.f. & Thomson) O.E. Schulz., *Pholidota imbricata* Lindl. and *Potamogeton octandrus* Poir. have been reported from the remote localities of Garhwal Himalaya which turned out to be either additions to the flora of Garhwal or collected after a long interval.

2104. **Rawat, D.S., Dangwal, L.R & Gaur, R.D. 1996a.** "*Pycnoplinthopsis bhutanica* (Hara) Jafri (Brassicaceae): New record from West Himalaya". *J. Bombay Nat. Hist. Soc.* 93(1): 109–111.

Abstract: *Pycnoplinthopsis bhutanica* (Hara) Jafri (Brassicaceae) has been reported forst time for Garhwal, West Himalaya from Shilla Samudra and Roopkund area, Chamoli district. Earlier this species was known from Bhutan, Sikkim and Nepal.

2105. **Rawat, D.S., Dangwal, L.R. & Gaur, R.D. 1996b.** "A new species of *Dilophila* Thorns. (Brassicaceae) from Garhwal Himalaya (India)". *J. Bombay Nat. Hist. Soc.* 93(2): 262–264.

Abstract: A new species of *Dilophila* Thorns. viz., *D. purii* allied *D. salsa* Thoms. has been described and illustrated from Roopkund, Garhwal Himalaya.

2106. **Rawat, D.S., Nautiyal, D.C. & Gaur, R.D. 1996.** "A note on *Corydalis lathyroides* Prain (Fumariaceae)". *J. Econ. Taxon. Bot.* 20(1): 119–121.

Abstract: *Corydalis lathyroides* Prain has been collected from Rambala, Garhwal with rootstock and radical leaves intact for the first time.

2107. **Rawat, D.S., Singh, H. & Rana, C.S. 2009.** "New distributional records of *Dicranostigma lactucoides* and *Dipcadi serotinum* from Uttaranchal". *J. Econ. Taxon. Bot.* 33(1): 32–34.

Abstract: *Dicranostigma lactucoides* Hook. f. & Thoms. (Papaveraceae) and *Dipcadi serotinum* (L.) Medik. (Liliaceae) two rare taxa are reported from Uttaranchal after a long period.

2108. **Rawat, D.S., Tiwari, J.K., Tiwari, P. & Nautiyal, M. 2017.** "*Lysionotus serratus* D. Don, a noteworthy plant species from Chamoli, Western Himalaya, Uttarakhand, India". *Ann. Pl. Sci.* 6 (1): 1492–1493.

Abstract: The present paper deals with the occurrence of *Lysionotus serratus* D. Don (Gesneriaceae) in Madwa-Gad, Gairsain block, district Chamoli of Uttarakhand. A detailed nomenclature, description, distribution, ecology and figures have been provided.

2109. **Rawat, G.S. 1987.** "On the occurrence of *Lalldhwojia cooperi* Farille (Apiaceae) in India". *J. Bombay Nat. Hist. Soc.* 84(3): 725–727.

Abstract: *Lalldhwojia cooperi* Farille (Apiaceae) has been reported for the first time for North-West Himalaya from Tungnath, Chamoli district. So far this species was reported from Sikkim-Bhutan border, Eastern Himalaya.

2110 **Rawat, G.S. & Pangtey, Y.P.S. 1983.** "*Herminium josephii* Rchb. f. (Orchidaceae), a new record for western Himalaya". *Indian J. Forest.* 6(2): 171.

Abstract: *Herminium josephii* Rchb. f. (Orchidaceae), a new record for western Himalaya from Pithoragarh district of Kumaun. Earlier this species was reported from Sikkim.

2111. **Rawat, G.S. & Pangtey, Y.P.S. 1984.** "*Petasites tricholobus* French. (Asteraceae): A new record for India". *Curr. Sci.* 53: 1260.

2112. **Rawat, G.S. & Pangtey, Y.P.S. 1985a.** "*Neottianthe calcicola* (W.W.Sm.) Schlt. (Orchidaceae): New to the flora of India". *Curr. Sci.* 54: 1005–1006.

2113. **Rawat, G.S. & Pangtey, Y.P.S. 1985b.** "Addition to the flora of U.P. Hills". *J. Econ. Taxon. Bot.* 6(3): 693–695.

Abstract: In the present paper ten flowering plants belonging to eight families are being reported new to the flora of U.P. hills.

2114. **Rawat, G.S. & Pangtey, Y.P.S. 1985c.** "Some interesting plant records from Kumaun Himalaya". *J. Econ. Taxon. Bot.* 6(3): 696–698.

Abstract: Nine plants spread over in five families are being reported in this communication new to the flora of Kumaun Himalaya.

2115. **Rawat, G.S. & Pangtey, Y.P.S. 1987a.** "A note on *Rosa osmastonii* Rawat et Pangtey *nom. nov.* from Kumaun Himalaya". *Indian Forester* 113(12): 823–824.

2116. **Rawat, G.S. & Pangtey, Y.P.S. 1987b.** "On the occurrence of *Morina betonicoides* Benth. (Dipsacaceae) in Western Himalaya". *Indian J. Forest.* 10(1): 118.

Abstract: The occurrence of *Morina betonicoides* Benth. (Dipsacaceae) in Western Himalaya is here being reported for the first time from Barjikang Pass, Pithoragarh district, Kumaun. This species is so far reported from Sikkim, Bhutan and Tibet.

2117. **Rawat, G.S. & Pangtey, Y.P.S. 1987c.** "New distribution record of plants from Kumaon Himalaya". *Indian J. Forest.* 10(2): 148–149.

Abstract: Four species viz., *Arctium lappa* Linn. (Asteraceae), *Hyoscyamus niger* Linn., *Physochlaina praealta* (D. Don) Hook.f. (Solanaceae) and *Mentha longifolia* (Linn.) Huds. turned out to be new for Kumaun from Kali valley. All the plants reported herein are confined to the high altitude regions above 3300 m.

2118. **Rawat, G.S., Chandola, S. & Naithani, H.B. 2007.** "A note on the occurrence of *Heimia myrtifolia* (Lythraceae) in India". *Indian Forester* 133(5): 697–699.

Abstract: *Heimia myrtifolia* Cham. & Schlechtd. (Lythraceae) has been reported for the first time for India in wild from Kakrighat on way to Almora. Systematic treatment, etymology and a brief description of the species along with an illustration has been provided to aid identification.

2119. **Renz, J. 1987.** "New species of *Peristylis* and *Platanthera* (Orchidaceae) from India and New Guinea". *J. Orchid Soc. India* 1(1, 2): 23–28.

Abstract: *Peristylis kumaonensis* Renz from North West Himalaya (Kumaon Himalaya) and *Platanthera afrakensis* Renz from Western New Guinea (Irian Jaya) are described and illustrated. A key is given for the Malesian *Platanthera* species.

2120. **Roy, G.P. 1982.** "New record of the grass genus *Phippsia* R. Br. from India". *Bull. Bot. Surv. India* 24(1-4): 229–230.

Abstract: *Phippsia algida* (Selander) R. Br. has been reported for the first time for the grass flora of India from Allahabad.

2121. **Roy, G.P. & Shukla, B.K. 1982.** "Some grasses new to the flora of Upper Gangetic Plain". *Indian J. Forest.* 5(1): 81–82.

Abstract: Four species of grasses viz., *Eragrostis namaquensis* var. *diplachnoides* (Steud.) Clayton, *E. tenuifolia* (A. Rich.) Steud., *Eragrostiella leioptera* (Stapf) Bor and *Eragrostiella brachyphylla* (Stapf) Bor have been found to be new reords for Upper Gangetic plain from hilly and remote localities of Damoh district and through checking of herbarium specimens.

2122. **Sah, B.C.L. & Joshi, D.N. 1981.** "Note on the occurrence of *Agrostis nervosa* Nees ex Trin. in Western Himalaya". *J. Bombay Nat. Hist. Soc.* 77(2): 360–361.

Abstract: An interesting grass, *Agrostis nervosa* Nees ex Trin. has been reported for the first time for North Western Himalaya from Rudranath bugyal, Chamoli district.

2123. **Saini, D.C. 1998.** "New phytogeographic record of *Allium hookeri* Thwait. from Upper Gangetic plain". *J. Econ. Taxon. Bot.* 22(2): 462–464.

Abstract: *Allium hookeri* Thwait. has been reported first time for Upper Gangetic plain from Lucknow district, Uttar Pradesh.

2124. **Saini, D.C. 2002a.** "New distributionl record of some plants for flora of Lucknow district in Uttar Pradesh". *J. Econ. Taxon. Bot.* 26(2): 371–384.

Abstract: The present communication comprises the enumeration of 71 species belonging to 56 genera and 33 families alongwith 20 plant species as new records for the flora of Upper gangetic Plain. The families in enumeration are arranged according to Bentham and Hooker's system of classification with some modifications at places, by introduction of some new split up families of Hutchinson. The plan species in each family are arranged alphabetically with their correct name, basionym, synonyms, habit, habitat, a short description, field note, phenology and locality.

2125. **Saini, D.C. 2002b.** "*Talinum portulacifolium* (Forsk.) Asch. ex Schw.– A useful vegetable and garden plant– hitherto unrecorded taxon from Upper Gangetic Plain". *J. Econ. Taxon. Bot.* 26(3): 579–582.

Abstract: The present paper comprises an additional distributional record of *Talinum portulacifolium* (Forsk.) Asch. ex Schw. from Lucknow district in Uttar Pradesh as new record for the flora of Upper Gangetic Plain. As the species is reported for the first time from Lucknow, this also forms the basis of new record for the flora of Lucknow district. A detailed description, ecology, phenology, taxonomy, phytogeography and uses have been provided along with illustrations.

2126. **Saini, D.C. 2003.** "*Chenopodium schraderianum* Roem. & Schult. (Chenopodiaceae)– A new record for Flora of India". *J. Econ. Taxon. Bot.* 27(Suppl.): 1024–1028.

Abstract: The present paper deals with an additional distributional record of *Chenopodium schraderianum* Roem. & Schult. for India from Maharajganj district, Uttar Pradesh, as well as a new record for Flora of India. A detailed description, ecology, phenology (only flowering and fruiting time), taxonomy and phytogeography have been provided along with illustrations.

2127. **Samant, S.S. & Pangtey, Y.P.S. 1987a.** "A note on the recollection of *Pecteilis triflora* (D. Don) Tang & Wang (Orchidaceae) from Kumaun (Western Himalaya)". *J. Econ. Taxon. Bot.* 10(2): 433–434.

Abstract: *Pecteilis triflora* (D. Don) Tang & Wang (Orchidaceae) has been recollected after more than 80 years from Pithoragarh district, Kumaun.

2128. **Samant, S.S. & Pangtey, Y.P.S. 1987b.** "New distribution records of two orchids from Kumaun Himalaya". *J. Econ. Taxon. Bot.* 11(2): 475–476.

Abstract: Two species of orchid viz., *Habenaria furcifera* Lindl. and *Peristylis lawii* Wight has been collected for the first time for Kumaun Himalaya from Pithoragarh district.

2129. **Samant, S.S. & Pangtey, Y.P.S. 1993.** "Rediscovery of some rare and endangered shrubs and climbers of Kumaon Himalaya (North-Western Himalaya)". *J. Econ. Taxon. Bot.* 17(3): 509–512.

Abstract: The present paper reports the recollection of 10 rare and threatened shrubs and climbers belonging to 8 genera and 7 families from Kumaon Himalaya (North-Western Himalaya).

2130. **Saxena, H.O. 1967.** "New records for North and North-west India – II". *Indian Forester* 93(9): 657.

Abstract: *Scleria biflora* Roxb. subsp. *biflora* and *Utricularia arenaria* A. DC. has been reported for the first time for Uttar Pradesh from Rajpur, Dehra Dun.

2131. **Sharma, J.P. & Singh, S. 1985.** "Two new additions to the flora of Upper Gangetic Plain". *J. Econ. Taxon. Bot.* 7(2): 449–450.

Abstract: *Lactuca dolichophylla* Kitamura (Asteraceae) and *Polygonum tubulosum* Boiss. (Polygonaceae) has been reported for the first time for Upper gangetic plain from Lakhimpur-Kheri and Bijnor of Uttar Pradesh, respectively.

2132. **Sharma, M. 1984.** "Two new plant reports for Nainital Hills". *Indian J. Forest.* 7(2): 163–164.

Abstract: Two speces namely, *Monotropa uniflora* L. (Monotropaceae) and *Rhynchoglossum obliquum* Blume (Gesneriaceae) have been reported for the first time from Nainital.

2133. **Sharma, M.P., Aswal, B.S. & Mehrotra, B.N. 1990.** "*Astragalus badrinathensis* (Fabaceae): A new species from Chamoli district, Uttar Pradesh (India)". *J. Econ. Taxon. Bot.* 14(1): 113–114.

Abstract: A new species of *astragalus* Linn., viz., *A. badrinathensis* allied to *P. pseudo-psilacanthus* Ali has been described and illustrated from Vasudhara near Badrinath, Chamoli district, Uttar Pradesh.

2134. **Sharma, S.C. & Goel, A.K. 2000.** "*Jacaranda cuspidifolia* (Bignoniaceae)– A new introduction for India". *Indian J. Forest.* 23(4): 438–439.

Abstract: *Jacaranda cuspidifolia* Mart., belonging to the family Bignoniaceae, has been introduced from Brazil (South America) for the first time in India in the Botanic Garden at NBRI, Lucknow. It is carching attraction of the landscapists and connoisseurs due to its beautiful leaves and blue-violet flowers.

2135. **Shukla, B.K., Tiwari, A.P. & Shukla, A.N. 2012.** "*Senna uniflora* (Mill.) H.S. Irwin & Barneby (Caesalpiniaceae) and *Sida tiagii* Bhandari (Malvaceae): New Records for the flora of Uttar Pradesh". J. *Non-Timber Forest Prod.* 19(2): 157–158.

Abstract: Two species namely, *Senna uniflora* (Mill.) H.S. Irwin & Barneby (Caesalpiniaceae) and *Sida tiagii* Bhandari (Malvaceae): have been recorded for the first time of the flora of Uttar Pradesh.

2136. **Siddique, M.O. & Dixit, S.N. 1969a.** "Some interesting Polygonums from Gorakhpur". *Bull. Bot. Surv. India* 11(3&4): 432–433.

Abstract: Three species of *Polygonum* viz., *P. minus* Huds., *P. persicaria* L. and *P. pulchrum* Bl. have been turned to be new records for Upper Gangetic plain from Gorakhpur.

2137. **Siddique, M.O. & Dixit, S.N. 1969b.** "Some noteworthy plant species from Gorakhpur". *J. Bombay Nat. Hist. Soc.* 72(2): 620–621.

Abstract: In the present paper ten species which are new records for the flora of Upper Gangetic Plain from Gorakhpur.

2138. **Silas, R.A. & Gaur, R.D. 1986.** "Notes on the distribution of rare and little known *Carex ligulata* Nees from North-West Himalaya". *J. Bombay Nat. Hist. Soc.* 83(2): 467–468.

Abstract: *Carex ligulata* Nees has been reported from North-West Himalaya after one and half centuries from Binsar valley (Sundergaon Gadhera) and Raath area (district Pauri) at the elevation of 2000 m.

2139. **Silas, R.A. & Gaur, R.D. 1987.** "On the occurrence of few little known plant species from Garhwal Himalaya". *J. Bombay Nat. Hist. Soc.* 84(2): 489–491.

Abstract: A few little known plant species namely *Galium cryptanthum* Hemsl. (Rubiaceae), *Euphorbia peoples* Linn. (Euphorbiaceae) and *Glyceria tonglensis* Clarke (Poaceae) are new additions to the flora of Garhwal from Dudhatoli region.

2140. **Silas, R.A. & Gaur, R.D. 1988.** "Notes on the occurrence of *Eusteralis cruciata* (Benth.) Panigrahi from Dudhatoli region (Garhwal Himalaya)". *J. Econ. Taxon. Bot.* 12(1): 243–245.

Abstract: *Eusteralis cruciata* (Benth.) Panigrahi has been recollected after a lapse of more than a century from Dudhatoli region (Garhwal Himalaya).

2141. **Silas, R.A. & Gaur, R.D. 1989.** "*Indocourtoisia cyperoides* (Roxb.) Bennet et Raizada: A new record for western Himalaya". *Indian J. Forest.* 12(2): 162.

2142. **Silas, R.A. & Gaur, R.D. 1990a.** "*Lecanthus peduncularis* (Royle) Wedd. var. *garhwalensis:* A new variety from Garhwal Himalaya". *J. Bombay Nat. Hist. Soc.* 87(2): 280–281.

Abstract: A new variety *Lecanthus peduncularis* (Royle) Wedd. viz., *L. peduncularis* var. *garhwalensis* has been described from Binsar-Dudhatoli trek, Pauri Garhwal district of Garhwal Himalaya.

2143. **Silas, R.A. & Gaur, R.D. 1990b.** "Distribution of some rare and less known species from Dudhatoli region (Garhwal Himalaya)". *J. Bombay Nat. Hist. Soc.* 87(2): 327–329.

Abstract: Some rare and less known species viz., *Berberis petiolaris* Wall. ex G. Don (Berberidaceae), *Brassaiopsis aculeate* (Buch.-Ham. ex D. Don) Seem. (Araliaceae) and *Gerbera maxima* (D. Don) Beauvered (Asteraceae) have been recorded from Dudhatoli hills of Pauri Garhwal district.

2144. **Silas, R.A. & Gaur, R.D. 1990c.** "*Polygonum binsarii* (Polygonaceae): A new species from Garhwal Himalaya, India". *J. Econ. Taxon. Bot.* 14(1): 111–112.

Abstract: A new secies of *Polygonum* viz., *P. binsarii* allied to *P. filicaule* Wall. ex Meissn. Has been described and illustrated from Binsar, Pauri Garhwal, Uttar Pradesh.

2145. **Singh, A.K. 2006.** "*Chrysopogon polyphyllus* (Hack. ex Hook.f.) Blatt. & McCann (Poaceae) from Chandauli district, new to Uttar Pradesh". *J. Econ. Taxon. Bot.* 30(2): 288–290.

Abstract: *Chrysopogon polyphyllus* (Hack. ex Hook.f.) Blatt. & McCann (Poaceae) is reported for the first time from Uttar Pradesh. Detailed description and illustration are provided.

2146. **Singh, A.K. 2007.** "*Sporobolus tetragonus* Bor and *Sporobolus wallichii* Munro & Trin. (Poaceae): Two new records for Uttar Pradesh from Varanasi division". *Indian J. Forest.* 30(2): 189–190.

Abstract: *Sporobolus tetragonus* Bor and *Sporobolus wallichii* Munro & Trin. were collected from Varanasi and Chandauli districts of Uttar Pradesh respectively. These two taxa are not reported earlier from the state of Uttar Pradesh. Complete description and other details are provided.

2147. **Singh, A.K. & Srivastava, M. 2006.** "*Zoysia* Willd. (Gramineae)– A new generic record for Uttar Pradesh". *J. Econ. Taxon. Bot.* 30(3): 501–503.

Abstract: The paper reports *Zoysia* Willd., represented by *Z. matrella* (L.) Merr., as an addition to the grass genera of Uttar Pradesh. Detailed description and illustrations are provided to facilitate easy identification.

2148. **Singh, A.K., Sahu, R.K. & Singh, S. 2010.** "First report of *Ruellia sivarajanii* Sreedevi, Remadevi & Binoj Kumar (Acanthaceae) from Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 34(3): 497–500.

Abstract: *Ruellia sivarajanii* Sreedevi, Remadevi & Binoj Kumar (Acanthaceae) collected from Varanasi district is reported for the first time from Uttar Pradesh. Detailed description and illustrations of the taxa alongwith seedling are provided to facilitate easy identification.

2149. **Singh, A.K., Sahu, R.K. & Srivastava, M. 2011.** "On the occurrence of *Ipomoea laxiflora* in Uttar Pradesh, India". *Indian J. Forest.* 34(3): 335–338.

Abstract: *Ipomoea laxiflora* H.J. Chowdhery & M.R. Debta collected from pigeon pea crop fields and mango orchards of Permanandpur village of Varanasi district is reported for the first time from Uttar Pradesh. Detailed description and illustrations are provided.

2150. **Singh, A.K., Srivastava, M. & Singh, P. 2007a.** "An addition to the grass flora of Uttar Pradesh (India)– *Heteropogon fischerianus* Bor". *J. Econ. Taxon. Bot.* 31(1): 13–15.

Abstract: *Heteropogon fischerianus* Bor (Poaceae) collected from Chakiya of Chandauli district is a new distributional record for the state of Uttar Pradesh.

2151. **Singh, A.K., Srivastava, M. & Singh, P. 2007b.** "*Fimbristylis eregrostris* (Nees & Mey. ex Nees) Hance– A new record for Uttar Pradesh (India)–". *J. Econ. Taxon. Bot.* 31(2): 348–350.

Abstract: This paper records the occurrence of *Fimbristylis eregrostris* (Nees & Mey. ex Nees) Hance as new plant record for Uttar Pradesh. Detailed description is provided with illustration, distribution and phonological data.

2152. **Singh, A.K., Srivastava, M. & Srivastava, S. 2007.** "*Brachiaria milliformis* (J. Presl ex C. Presl) A. Chase (Poaceae)– A new record for Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 31(2): 283–285.

Abstract: *Brachiaria milliformis* (J. Presl ex C. Presl) A. Chase (Poaceae) is reported for the first time from Varanasi division of Uttar Pradesh. Detailed description is provided with phenology, distribution and an illustration.

2153. **Singh, A.K., Devi, Y., Srivastava, M. & Singh, S. 2008.** "The genus *Alternanthera* Forssk. (Amaranthaceae) in south-eastern Uttar Pradesh". *J. Econ. Taxon. Bot.* 32(2): 393–402.

Abstract: The taxonomic account of the genus *Alternanthera* Forssk. In south-Eastern Uttar Pradesh (Chandauli, Ghazipur, Jaunpur, Mirzapur and Varanasi districts) is presented here. A key to the six species is provided along with detailed descriptions, flowering and fruiting period, distribution, ecology, critical notes and uses if any. Lines drawing of different floral parts are also given. Two species, viz., *A. bettzichiana* (Regel) Nicolson and *A. philoxeroides* (Mart.) Griseb. are found as new record for the Upper Gangetic Plain.

2154. **Singh, A.K., Sahu, R.K., Singh, Ayush K. & Dubey, S.N. 2013.** "*Exacum pumilum* Griseb. (Gentianaceae: Exaceae)– A new record for the state of Uttar Pradesh, India with a special focus on seedling morphology". *J. Econ. Taxon. Bot.* 37(3): 582–586.

Abstract: *Exacum pumilum* Griseb. is newly recorded from Mirzapur district of the state of Uttar Pradesh, India. Detailed description including seedlings, images, sketches and notes are provided.

2155. **Singh, D. & Goel, R. 1999.** "*Pittosporum eriocarpum* (Pittosporaceae)– An endangered species with its new distribution record from Tehri district". *Ann. Forest.* 7(2): 185–191.

Abstract: The present study reports the occurrence of an endangered species *Pittosporum eriocarpum* mostly on some rocky habitat around lower Mussoorie hills in Dehra Dun around Kempty falls; Dhaulagiri and Chamba hills at Nagli in Tehri and around Kurakhad and Jeullikot in Nainital district of Uttar Pradesh. It is a new record of distribution of this plant species from Tehri district, since this species was not known earlier from here.

2156. **Singh, H. & Singh, V. 1976.** "A new distributional record for *Cirrhopetalum viridiflorum* Hook.f.". *Geobios* 3: 107.

Abstract: *Cirrhopetalum viridiflorum* Hook.f. has been recorded for the first time for Western Himalaya from Daula hill (Mallagarkha, Pithoragarh), earlier reported from Eastern Himalaya.

2157. **Singh, H., Srivastava, A., Kumar, A., Sundaresan, V. & Husain, T. 2018.** "*Thalictrum nainitalense* (Ranunculaceae), a new species from the Uttarakhand Himalaya, India". *Folio Geobotanica* 53(4): 449–455.

Abstract: The genus Thalictrum (Ranunculaceae), commonly known as meadow rue, comprises 200 species throughout the world and there are 25 taxa growing in India. While revising the genus in India, we came across a new species collected in Nainital in the Uttarakhand Himalaya. The new species, *Thalictrum nainitalense*, is differentiated from its closely allied species *T. punduanum* in its habitat preference for moist shaded stands in *Rhododendron arboreum* and *Quercus oblongata* forests, creamy-white flowers, the size of the sepals and stamens, and fusiform, stipitate, hairy achenes. A line drawing, colour plates and a key to the species found in the Uttarakhand Himalaya are provided to aid identification. The status of *Thalictrum nainitalense* as a species new to science is supported by morphological and molecular data.

2158. **Singh, K.K. 1979.** "New Plant records from Kheri district (U.P.) for the Upper Gangetic Plain". *Indian J. Forest.* 2(2): 158–160.

Abstract: This paper records the occurrence of *Centrostachys aquatica* (R. Br.) Wall. ex Moq., *Cnidium monnieri* (Linn.) Cusson., *Curcuma amada* Roxb., *Eragrostis atrovirens* (Desf.) Trin. ex Steud., *Ipomoea quinata* R. Br., *Jasminum roxburghianum* Wall. ex DC. and *Lactuca dolichophylla* Kitamura as new plant records for Uttar Pradesh.

2159. **Singh, N.B. & Bhattacharyya, U.C. 1982.** "*Radiola humilis* Hook.f. et Thoms. (Crassulaceae)– A new record for Western Himalaya". *J. Econ. Taxon. Bot.* 3: 287–288.

Abstract: After critical examination of specimens, types, photographs in different Indian herbaria as well as from Kew and BM, the authors have been reported *Radiola humilis* Hook.f. et Thoms. for the first time for Western Himalaya from Shobala Darina valley, Kumaon, U.P., earlier reported from Sikkim, Nepal and Tibet (Eastern Himalaya). The present finding indicates that the distribution pattern of this species from eastern to western Himalaya through Nepal and Tibet. The detailed description along with its systematics to facilitate further collection and to know the present status of the species.

2160. **Singh, N.B. & Bhattacharyya, U.C. 1985.** "A new variety of *Sinocrassula indica* (Decne.) Berger (Crassulaceae) from India". *J. Econ. Taxon. Bot.* 6(1): 211–212.

Abstract: A new variety of *Sinocrassula indica* (Decne.) Berger viz. *S. indica* var. *paniculata* Singh et Bhattacharyya has been described and illustrated from Deolsari, Tehri-Garhwal, Uttar Pradesh.

2161. **Singh, N.P. 1963.** "*Vicia tetrasperma* (Linn.) Moench– A new record for the Upper Gangetic plain". *Bull. Bot. Surv. India* 5(3&4): 333–334.

Abstract: *Vicia tetrasperma* (Linn.) Moench has been recorded for the first time for the Upper Gangetic Plain from Niranjanpur about 5 km from Dehra Dun. Earlier it was reported from Nainital, Almora and Dinajpur.

2162. **Singh, N.P. 1964.** "Two new distributional records for U.P. plains". *Bull. Bot. Surv. India* 6(2-4): 305.

Abstract: *Cuscuta capitata* Roxb. and *Clinopodium umbrosum* (M. Bieb.) Koch have been recorded for the first time for plains of Uttar Pradesh from Bulandshahr district.

2163. **Singh, N.P. 1967.** "*Acalypha austrlis* Linn.– An addition to Indian flora". *Indian Forester* 93(3): 186–186.

Abstract: *Acalypha australis* Linn., a Chinese species with a range of disrtribution extending to Japan, is now recorded from Dehra Dun in Uttar Pradesh, India, as a weed of tea plantations. A detailed descriptive account of the species supported by illustrations is provided in the paper.

2164. **Singh, P.K. & Singh, S.K. 1991.** "*Synedrella nodiflora* (L.) Gaertn. (Asteraceae): A new record for North India". *Indian J. Forest.* 14: 161–162.

2165. **Singh, R., Narain, S. & Fatima, N. 2019.** "*Tragia plukenetii* Radcl.-Sm.– An addition to flora of Allahabad, Uttar Pradesh". *Curr. Bot.* 11: 36–37.

Abstract: *Tragia plukenetii* Radcl.-Sm. is reported as a new addition to the Flora of Allahabad district of Uttar Pradesh. A detailed description, up to date nomenclature and photographs are provided here to facilitate its easy and correct identification in the field.

2166. **Singh, S. 1986.** "*Polygonatum geminiflorum* Decne (Liliaceae) in Chamoli district". *Indian J. Forest.* 9(3): 272.

Abstract: *Polygonatum geminiflorum* Decne has been reported first time for Chamoli from Hemkund.

2167. **Singh, S. 1987.** "Additions to aquatic flora of Chamoli district". *J. Econ. Taxon. Bot.* 10(1): 171–172.

Abstract: *Ceratophyllum demersum* L., *Hydrilla verticillata* (L.f.) Royle, *Limnophila indica* (L.) Druce, *Nechamandra alternifolia* (Roxb. ex Wight) Thwaites, *Nymphoides indica* (L.) O. Kuntze and *Utricularia australis* R. Br. has been collected from Dewar Tal, near Gopeshwar. These plant species turned out to be additions to the Flora of Chamoli district.

2168. **Singh, S. & Hajra, P.K. 1991.** "*Pimpinella hookeri* C.B. Clarke (Apiaceae) in Chamoli district (Uttar Pradesh)". *Indian J. Forest.* 14(2): 157.

2169. **Singh, S. & Naithani, H.B. 1995.** "*Leptochilus laciniatus* (Hook.) Ching (Polypodiaceae) in North West Himalaya". *Ann. Forest.* 3(2): 196.

Abstract: *Leptochilus laciniatus* (Hook.) Ching (Polypodiaceae) has been recorded for the first time for North West Himalaya from Mandal areas of Chamoli district of Uttar Pradesh.

2170. **Singh, S. & Singh, D.K. 1997.** Additions to the flora of Chamoli district, Uttar Pradesh. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.,* Addl. Ser.] 6: 109–125. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: Fifty seven species belonging to 28 families has an addition to the flora of Chamoli district of Uttar Pradesh.

2171. **Singh, S.C. 1995.** "Some interesting plants records after a gap of more than one century from the district Lucknow, U.P.". *J. Econ. Taxon. Bot.* 19(2): 419–424.

Abstract: In the present communication 14 species has been recorded after a gap of more than one century from the district Lucknow, Uttar Pradesh. Ut of these 14 plants species, 8 are medicinal and some of them having active principles like anticancer, hypotensive, hypoglycaemia, diuretic and other properties also.

2172. **Singh, S.C. & Shah, N.C. 1990.** "New records for Upper Gangetic plain from Lucknow". *J. Econ. Taxon. Bot.* 14(3): 748–749.

Abstract: Two species of *Spilanthes* viz., *S. ciliata* H.B.K. and *S. radicans* Jacq. has been recorded for the first time for the flora of Upper Gangetic plain from Lucknow.

2173. **Singh, S.C. & Srivastava, G.N. 1996.** "New records for Lucknow district, U.P.". *J. Econ. Tax. Bot.* 20(3): 645–649.

Abstract: In the present paper 34 plants species, either cultivated or running wild have been reported for the first time for the flora of Lucknow, Uttar Pradesh.

2174. **Singh, S.K. & Chandra, V. 1908.** "Merremia quinquefolia (L.) Hall. f.– A new record for Upper Gangetic plain". *Indian J. Forest.* 3(1): 54–55.

Abstract: The present paper represents *Merremia quinquefolia* (L.) Hall.f. as a new record for Upper Gangetic Plain flora and furnishes important information regarding its habit, habitat and exact locality of occurrence.

2175. **Singh, S.K. & Saini, D.C. 1981.** "*Scirpus lateriflorus* Gmel.- A new record for upper Gangetic plain". *Indian J. Forest.* 4(4): 331.

Abstract: *Scirpus lateriflorus* Gmel. has been recorded for the first time for upper Gngetic plain from Basti district.

2176. **Singh, V. 2018.** "*Fagonia schweinfurthii* (Hadidi) Hadidi ex Ghafoor (Zygophyllaceae)– An addition to the flora of Uttar Pradesh, India". *Indian J. Forest.* 41(3): 291–292.

Abstract: *Fagonia schweinfurthii* (Hadidi) Hadidi ex Ghafoor (Zygophyllaceae) is reported here as an addition to the flora of Uttar Pradesh, collected from Chambal Wildlife Sanctuary, Etawah. A detailed description and scanned herbarium sheet image are provided to facilitate proper identification.

2177. **Singh, V. & Murty, Y.S. 1966.** "*Eleocharis fistulosa* Schult.: A new record for the Upper Gangetic Plain". *J. Bombay Nat. Hist. Soc.* 63(2): 462–463.

Abstract: *Eleocharis fistulosa* Schult. has been reported for the first time for Upper Gangetic Plain from Meerut.

2178. **Singh, V., Srivastava, S.K. & Tewari, L.M. 2016.** "*Clerodendrum indicum* (L.) Kuntze– A folk medicine for skin ailment (Agiya) from Bhar aborigine of Tikri Reserve Forest, Gonda district, eastern Uttar Pradesh". *J. Non-Timber Forest Prod.* 23(4): 221–223.

Abstract: The present communication highlights a brief description of *Clerodendrum indicum* (L.) Kuntze (Lamiaceae) and its unique uses in treatment of skin ailments (Agiya) in the study area.

2179. **Singh, V., Srivastava, S.K. & Tewari, L.M. 2019.** "*Spermacoce alata* Aubl. (Rubiaceae)– A new record to the flora of Uttar Pradesh from Tirki Reserve Forest, Gonda district, India". *Indian J. Forest.* 42(3): 247–249.

Abstract: *Spermacoce alata* Aubl. (Rubiaceae) is reported here as a new record to the flora of Uttar Pradesh. Detailed description, herbarium image and relevant notes are provided.

2180. **Sinha, B.K. & Verma, B.K. 1985.** "*Cyperus sanguinolentus* Vahl. ssp. *cyrtostachys* (Miq.) Kern. (Cyperaceae) from Banda– A rare and noteworthy sedge from U.P.". *J. Econ. Taxon. Bot.* 7(3): 547–548.

Abstract: A rare and noteworthy sedge, *Cyperus sanguinolentus* Vahl. ssp. *cyrtostachys* (Miq.) Kern. has been reported from Atarra, Banda district of Uttar Pradesh, earlier reported from Raipur (Madhya Pradesh) and Dehra Dun.

2181. **Srivastava, A., Kumar, B. & Srivastava, S.K. 2017.** "On the correct identity and occurrence of *Elaeocarpus ganitrus* Roxb. ex G Don "Rudraksh" in India". *Indian Forester* 143(1): 76–77.

Abstract: In the present paper *Elaeocarpus lacunosus* Wall. ex Kurz has been reported for the first time for Indian territory Dehra Dun.

2182. **Srivastava, A., Srivastava, S.K. & Dangwal, L.R. 2016a.** "*Pittosporum eriocarpum* Royle (Pittosporaceae): An endemic, endangered species of North-West Himalaya facing threat". *Indian J. Forest.* 39(2): 169–172.

Abstract: The paper deals with the present distribution and conservation status with possible conservation measures of *Pittosporum eriocarpum*, an endangered and endemic tree species of Shiwaliks in Uttarakhand.

2183. **Srivastava, R.C. 1983a.** "*Aspidopterys orbiculata* (Wallich) Niedenzu– A new record for the flora of Uttar Pradesh". *J. Econ. Taxon. Bot.* 4: 319–321.

Abstract: *Aspidopterys orbiculata* (Wallich) Niedenzu has been recorded for the first time for the state of Uttar Pradesh from Almora, Nainital and Dehra Dun.

2184. **Srivastava, R.C. 1983b.** "*Aspidopterys balakrishnanii* Srivastava, *sp. nov.* (Malpighiaceae) from India". *J. Econ. Taxon. Bot.* 4(3): 1003–1005.

Abstract: A new species of *Aspidopterys* viz. *A. balakrishnanii* allied to *A. nutans* (Roxb.) DC. has been described and illustrated from West Duars, West Bengal and Tanakpur, Nainital, U.P.

2185. **Srivastava, R.C. 1983c.** "Notes on two infraspecific taxa of Malpighiaceae". *J. Econ. Taxon. Bot.* 4(3): 1025–1026.

Abstract: A new variety of *Aspidopterys wallichii* Hook.f. viz., *A. wallichii* var. *dehradunensis* has been described from Gorkha line, Dehra Dun, UP. *Hiptage beghalensis* var. *longifolia* Srivastava has been described for India from Assam, Uttar Pradesh and West Bengal.

2186. **Srivastava, S.K. & Pusalkar, P.K. (2015) 2016.** "Ethno-conservation of threatened plants of Western Himalaya - Traditional practices and current scenario". *J. Econ Taxon. Bot.,* Addl. Ser. 44: 122–137.

Abstract: The present communication provides comparative account of various past ethnic practices of sustainable utilization and current practices of over exploitation of 22 selected threatened medicinal plants of the Western Himalaya.

2187. **Srivastava, S.K. & Singh, S. 2005.** "*Cicerbita filicina* (Duthie ex Stebbins) Mamgain & Rao (Asteraceae), rediscovered after type collection from Kumaon, Uttaranchal". *Bull. Bot. Surv. India* 47(1-4): 167–168.

Abstract: *Cicerbita filicina* (Duthie ex Stebbins) Mamgain & Rao has been rediscovered from similar habitat in adjacent areas of the type locality, i.e. Dhaliganga, between Chirkila and Sobla, Dharchula Tehsil of Pithoragarh district, Uttaranchal after a lapse of more than sixty years. The present locality of this species is away from all the sites of developmental activities like dam and power house construction. It is further mentioned here that this species does not face any threat due to any constructional activity as it is located in the civil forest adjoining fringes of Askot Musk Deer Sanctuary.

2188. **Tewari, K.C., Joshi, G.C. & Uniyal, M.R. 1989.** "*Verbascum thapsus* Linn.– A highly bactericidal herb scabies from Kumoun Himalaya". *Sachitra Ayurveda* (December): 400–410.

2189. **Tewari, K.C., Joshi, G.C., Tewari, R.N. & Pandey, N.K. 1989.** "*Lobellia pyamidalis* Wall.– A drug for asthma from Himalayan folklore". *Sachitra Ayurveda* (December): 398–400.

2190. **Tiwari, A.P. & Ansari, A.A. 2012.** "*Stylosanthes fruticosa* (Retz.) Alston (Fabaceae)– New record for Uttar Pradesh". *Indian J. Forest.* 35(4): 499–500.

Abstract: A *Stylosanthes fruticosa* (Retz.) Alston (Fabaceae), hitherto not recorded is reported for the first time for Uttar Pradesh from Ranipur Wildlife Sanctuary, Chitrakoot. A brief description alongwith other details and photographs are provided to facilitate is identification in field.

2191. **Tiwari, A.P. & Ansari, A.A. 2013.** "*Senna hirsuta* (L.) H.S. Irwin & Barneby (Caesalpiniaceae)– A new record for Uttar Pradesh". *Phytotaxonomy* 13: 157–158.

Abstract: *Senna hirsuta* (L.) H.S. Irwin & Barneby belonging to the family Caesalpiniaceae, hitherto unrecorded from Uttar Pradesh is reported for the first time from Manikpur, Chitrakoot of the state. The details include correct nomenclature, relevant synonyms, references, morphological features, distribution in the world and in India, phonological data and ecological notes for easy identification of the species in the field.

2192. **Tiwari, A.P. & Ansari, A.A. 2014.** "*Crotalaria shuklae* Arjun Prasad Tiwari & Anis Ahmad Ansari (Fabaceae)– a new species from India". *Taiwania* 59(1): 54–58.

Abstract: A new species *Crotalaria shuklae* Arjun Prasad Tiwari & Anis Ahmad Ansari is described from Etawah district of Uttar Pradesh, India with detailed description, illustration, photographs, etc., for easy identification in field.

2193. **Tiwari, A.P. & Garg, A. 2018.** "Four new records of angiosperms for Uttar Pradesh". *Indian J. Forest.* 41(3): 311–313.

Abstract: Four species of angiosperm viz., *Boehmeria penduliflora* Wedd. ex D.G. Long, *Hewittia malabarica* (L.) Suresh., *Lantana veronicifolia* Hayek and *Potentilla gelida* C.A. Mey. are reported for the first time from Uttar Pradesh as new records for the state. Their nomenclatural citation, taxonomic description with flowering and fruiting periods, distribution, habitat and specimen details are provided.

2194. **Tiwari, J.K. & Tiwari, P. 2014.** "New distributional record of *Toricellia tiliifolia* DC. (Toricelliaceae) from Chamoli Garhwal, Uttarakhand, India". *Ann. Pl. Sci.* 3(11): 888–890.

Abstract: During the recent floristic explorations in Gairsain area of district Chamoli (Uttarakhand), the authors spotted the population of *Toricellia* growing in Oak-mixed forest. Critical examination of the specimen in the herbaria (BSD & DD) and through literature surveys revealed the plant as *Toricellia tiliifolia* DC. of family Toricelliaceae. A detailed description of the species has be en given and reported here as new record to Garhwal Himalaya.

2195. **Tiwari, J.K., Rawat, D.S. & Tiwari, P. 2015.** "*Exacum paucisquamum* (Gentianaceae): A new record for Western Himalaya, India". *Rheedea* 25(1): 57–58.

Abstract: *Exacum paucisquamum* (C.B. Clarke) Klack., so far known in India only from the Eastern Himalaya (Sikkim & Darjeeling), is reported for the first time for Western

Himalaya from Gairsain, Chamoli district, Uttarakhand. A detailed description, phenology, distribution and figures have been provided.

2196. **Tiwari, J.K., Tiwari, P., Rawat, D.S. & Ballabha, R. 2015.** "Occurrence of *Sesamum mulayanum* Nair in Garhwal Himalaya, Uttarakhand". *Indian J. Pl. Sci.* 4(2): 33–35.

Abstract: The authors spotted population of *Sesamum mulayanum* Nair in some locality of Garhawal Himalaya and being reported here as additions to flora of Garhwal Himalaya. A detailed description, phenology, distribution and figures have been provided.

2197. **Tiwari, J.K., Tiwari, P., Rawat, D.S., Ballabha, R. & Rana, C.S. 2015.** "*Alternanthera philoxeroides* (Mart.) Griseb. on uphill journey in Uttarakhand, India". *Int. J. Curr. Res.* 7(3): 177–178.

Abstract: Alligator weed [*Alternanthera philoxeroides* (Mart.) Griseb.] especially in tropical and warm temperate regions. Recently, its occurrence was recorded in tropical parts and foot hills of Uttarakhand state. The uphill journey of the all serious matter of concern. The weed may reach to alpine region of Himalaya soon by taking route along water courses, as it can readily survive in cold winter and severe frost.

2198. **Tiwari, J.K., Tiwari, P., Rawat, D.S., Ballabha, R. & Rana, C.S. 2016.** "New distribution record of *Sarcopyramis napalensis* Wall. (Melastomataceae) from Garhwal Himalaya, Uttarakhand, India". *J. Threatened Taxa* 8(5): 8835–8836.

Abstract: *Sarcopyramis napalensis* Wall. is reported for the first time from the Panichhoya forest, Chamoli district, Garhwal Himalaya, Uttarakhand. A detailed description, phenology, distribution and figures are provided here.

2199. **Tiwari, R.N., Tewari, K.C. & Josh, G.C. 1989.** "*Panax pseudoginseng* Wall.: A new record for Western Himalaya". *Proc. Natl. Acad. Sci., India* 59(B) 11: 175–176.

2200. **Tiwari, U.L., Adhikari, B.S. & Rawat, G.S. 2010.** "*Notholirion macrophyllum* (D. Don.) Boiss., new record for western Himalaya, India". *Indian J. Forest.* 33(2): 233–234.

Abstract: *Notholirion macrophyllum* (D. Don.) Boiss. is reported for the first time for Western Himalaya from Chopta, Chamoli district.

2201. **Tiwari, U.L., Adhikari, B.S. & Rawat, G.S. 2011.** "On the recollection and rediscovery of *Onosma pyramidale* Hook. f., Boraginaceae from Chamoli, Uttarakhand". *Asian J. Pharmacy & Life Sci.* 1(4): 406–408.

Abstract: *Onosma pyramidale* Hook. f. (Boraginaceae) is an endemic species so far known only from Kali Valley, Eastern Kumaun (Uttarakhand). Original description was based on an illustration and seed send by Duthie. This paper deals with recent recollection and new record for Chamoli district of Garhwal Himalaya, Uttarakhand and species collected after a lapse of 110 years.

2202. **Tiwari, U.L., Rawat, G.S. & Adhikari, B.S. 2012.** "Rediscovery of two endemic species of *Berberis* from Uttarakhand, Western Himalaya, India". *Biodiv. Res. & Conserv.* 28(1): 19–24.

Abstract: Two endemic Berberis species (Berberidaceae) viz., Berberis ahrendtii R. R. Rao and Uniyal and Berberis lambertii Parker, are first time rediscovered after ca. 100 years since their type localities were found. These species are recorded from the Chamoli and Pithoragarh districts of Uttarakhand, India. Taxonomic description, synonyms, distribution information, locality details of specimens examined and photographs are provided for each species.

2203. **Tiwari, U.L., Rawat, G.S. & Adhikari, B.S. 2014.** "*Berberis karnaliensis* Bh. Adhikari (Berberidaceae): A new addition to the flora of India". *Biodiv. Res. & Conserv.* 34: 7–10.

Abstract: *Berberis karnaliensis* Bh. Adhikari, a recently described species was recorded for the first time from the Indian territory. Hence, it is being reported herewith as an addition to the Flora of India. The species differs from its closely related taxon viz. *Berberis jaeschkeana* Schneid. var. *usteriana* Schneid. in having coriaceous leaves and 5-6 primary veins on each side of the midrib. Detailed information on taxonomy, morphology, habitat, ecology and distribution of *B. karnaliensis* as well as photographs and illustrations are provided here for the species identification.

2204. **Tripathi, A.K. & Murgassan, J. 1985.** "Occurrence of *Johannesbaptistia pellucida* (Dickie) Taylor et Drouet from Dehra Dun (U.P.)". *J. Econ. Taxon. Bot.* 7(2): 469–470.

Abstract: *Johannesbaptistia pellucida* (Dickie) Taylor et Drouet has been reported for the first time for North India from Dehra Dun (U.P.), earlier reported from Madras and West Bengal.

2205. **Tripathi, A.K. & Pandey, S.N. 1985.** "Occurrence of *Synechococcus elongates* Nag. (Cyanophyceae) from Unnano (U.P.), India". *J. Econ. Taxon. Bot.* 7(2): 464.

Abstract: *Synechococcus elongates* Nag. (Cyanophyceae) has been reported for Uttar Pradesh plain from Unnano. This alga has so far been reported in India from a lake in Vellayani, Travancore, rice fields of Udaipur, Rajasthan and along the banks of Rispana stream, Dehra Dun.

2206. **Uniyal, B.P. 1986.** "*Arundinella setosa* Trin. (= *A. mutica* Nees ex Steud.) in Upper Gangetic Plain". *Indian J. Forest.* 9(1): 93.

Abstract: *Arundinella setosa* Trin. has been reported first time for Upper Gangetic Plain from Mirzapur based on collection of U.C. Bhattacharyya.

2207. **Uniyal, B.P. 1991.** "A note on *Brachypodium distachyon* (L.) Beauv.". *J. Econ. Taxon. Bot.* 15(1): 448.

Abstract: *Brachypodium distachyon* (L.) Beauv. has been collected for the first time for Uttar Pradesh from Chamoli district, so far reported from Jammu & Kashmir only.

2208. **Uniyal, B.P. & Balodi, B. 1988.** "*Onosma dichroanthum* Boiss.– A poorly known species in India". *J. Econ. Taxon. Bot.* 12(2): 396.

Abstract: A poorly known species, *Onosma dichroanthum* Boiss. has been recorded for the first time for India from Kedarganga valley Gangotri, Uttarkashi district.

2209. **Uniyal, B.P. & Malhotra, C.L. 1981.** "*Brachiaria villosa* (Lam.) A. Camus var. *barbata* Bor in Northern India". *Indian J. Forest.* 4(1): 71.

Abstract: *Brachiaria villosa* (Lam.) A. Camus var. *barbata* Bor has been reported for the first time for Northern India from Almora. Earlier this species was reported from West Bengal.

2210. **Uniyal, B.P., Balodi, B. & Singh, D.K. 2002.** "Some scarcely collected plant species from Darma valley, Uttaranchal, India". *Phytotaxonomy* 2: 123–125.

Abstract: A detailed taxonomic account is given of *Onosma pyramidale*, *Dipcadi serotinum*, *Dicranostigma lactucoides*, *Pedicularis trichoglossa*, *Youngia gracilipes*, *Tsuga dumosa* and *Leucosceptrum canum*, which are rarely collected in the Indian flora and also poorly represented in different herbaria. The location of these taxa in this remote Dhauliganga (Darma) Valley in Pithoragarh district underscores the need for intensive survey in under-explored habitats of these species to correctly assess the status of species that have not been collected for long intervals.

2211. **Uniyal, B.P., Malhotra, C.L. & Pande, P.C. 1981.** "*Brachiaria villosa* var. *barbata* Bor in Northern India". *Indian J. Forest* 4(1): 71.

Abstract: *Brachiaria villosa* var. *barbata* Bor has been reported first time for Northern India from Almora. Earlier it was reported from West Negal and Nepal.

2212. **Upreti, P., Punetha, N., Datt, B. & Rana, T.S. 2010.** "*Pedalium murex* L. (Pedaliaceae)– A new addition to the flora of Uttarakhand state". *Ann. Forest.* 18(1): 159–161.

Abstract: *Pedalium murex* L. of the family Pedaliaceae has been reported as a new addition to the flora of Uttarakhand state from Tanakpur railway track, Champawat district in eastern Kumaun region.

2213. **Vaid, K.M. & Naithani, H.B. 1971.** "*Cuscuta santapaui* Banerji & Das– A new record for India". *Indian Forester* 97(8): 467–468.

Abstract: The new species *Cuscuta santapaui* Banerji & Das has hitherto been reported from Eastern Nepal only. Careful re-evaluation of the specimens deposited in the Dehra Dun Herbarium (F.R.I.) however, revealed that this species occurs in Dehra Dun and Kashmir also, thus extending its distribution to the farthest limit of the Himalayas in the west and establishing it as a 'new record for India

2214 **Vaishya, J.K., Ansari, A.A. & Dubey, N.K. 2013.** "*Spilanthes radicans* Jacq. (Asteraceae)– A lesser known plant from Uttar Pradesh". *Indian J. Forest.* 36(4): 509–512.

Abstract: *Spilanthes radicans* Jacq., a lesser known plant species is described and illustrated from Varanasi, Uttar Pradesh.

2215. **Vaishya, J.K., Ansari, A.A. & Dubey, N.K. 2014a.** "Notes on *Parthenium argentatum* A. Gray (Asteraceae)". *Indian J. Forest.* 37(2): 237–240.

Abstract: *Parthenium argentatum* A. Gray an introduced species is reported for the first time from Uttar Pradesh & Uttarakhand. A bief description alongwith distribution, ecological observation, illustration, photographs etc. are provided herewith to facilitate easy identification of the species.

2216. **Vaishya, J.K., Ansari, A.A. & Dubey, N.K. 2014b.** "Notes on *Tridax trilobata* (Cav.) Hemsl. (Asteraceae)". *Indian J. Forest.* 37(3): 295–296.

Abstract: *Tridax trilobata* (Cav.) Hemsl. an introduced species is reported for the first time from Chandbagh, Dehra Dun. A bief description alongwith distribution, ecological observation, illustration, photographs etc. are provided herewith to facilitate easy identification of the species in the field.

2217. **Vaishya, J.K., Ansari, A.A., Dubey, N.K. & Sachan, S. 2014.** "Notes on *Synedrella vialis* A. Gray (Asteraceae)". *Indian J. Forest.* 37(3): 313–316.

Abstract: *Synedrella vialis* A. Gray is reported for the first time from Allahabad district. Citation, brief description, distribution etc. are provided herewith for easy identification in the field.

2218. **Venkatareddi, B. 1969.** "A new plant record for the Upper Gangetic Plain". Sci. & *Cult.* 35(5): 209.

2219. **Venkatareddi, B. 1970.** "Two new records of Araceae from Upper Gangetic Plain". *J. Bombay Nat. Hist. Soc.* 67(1): 129–130.

Abstract: Two species of Araceae viz. *Typhonium schottii* Prain and *T. Roxburghii* Schott have been recorded for the first time for Upper Gangetic Plain from Ramgarh-Khusmi forest of Gorakhpur district of Eastern Uttar Pradesh.

2220. **Verma, B.K. & Misra, B.K. 1981.** "*Cyperus meeboldii* Kuk. from Allahabad new to flora of Upper Gangetic plain". *Indian J. Forest.* 4(1): 69.

Abstract: *Cyperus meeboldii* Kuk. has been reported for the first time for Upper Gangetic plain from moist marshy places in Garwa fort (Shankergarh) area of Allahabad district.

2221. **Verma, B.K. & Sinha, B.K. 1985.** "*Fimbristylis dipsacea* (Rottb.) Clarke from Banda, new to flora of Upper Gangetic plains". *J. Econ. Taxon. Bot.* 7(3): 637–638.

Abstract: *Fimbristylis dipsacea* (Rottb.) Clarke has been collected from Banda, new to flora of Upper Gangetic plains. Earlier reported from Madhya Pradesh, West Bengal and Assam.

2222. **Verma, P.K., Kewat, A.K., Rawat, K.K. & Chandra, A. 2018.** "Invasion of *Aristolochia littoralis* Parodi in Kailash sacred lnadscape, Uttarakhand". *Indian J. Forest.* 41(3): 231–233.

Abstract: *Aristolochia littoralis* Parodi, an invasive species reported from various countries, has been found growing in open forest of Kailash Sacred Landscape under Pithoragarh district of Uttarakhand and reported here.

2223. **Viswanathan, M.V. & Aswal, B.S. 1982.** "*Tetrastigma indicum* M. Maulik (Vitaceae)– A critical review". *J. Econ. Taxon. Bot.* 3: 279–280.

Abstract: *Tetrastigma indicum* M. Maulik has been collected from Dharm-Ganga valley in Tehri-Garhwal Himalaya, earlier reported from Nilam, G. Valley, Kumaon. Description provided by Maulik (1971) was inadequate and the contents of Latin description and its English version were contradictory in some aspects. So an amended detailed description was appended in this present paper.

2224. **Vohra, J.N. & Basu, D. 1985.** "*Ilex excelsa* (Wall.) Hook. f.– A rare tree in Western Himalaya". *J. Econ. Taxon. Bot.* 6(3): 721–722.

Abstract: A rare tree, *Ilex excelsa* (Wall.) Hook. f. has been reorded from Garhwal in Western Himalaya. Previously this species extends only up to Kumaon, where it has become rare.

2225. **Vohra, J.N. & Wadhwa, B.M. 1963.** "*Andreaea rupestris* Hedw.– A new record from Western Himalayas". *Bull. Bot. Surv. India* 5(2): 149–150.

Abstract: *Andreaea rupestris* Hedw. has been recorded for the first time for Western Himalaya from Mana village towards Badrinath. The only previous record of this species is from Sikkim Himalayas. In this note a detailed description of this taxon with illustrations and a key for the Indian taxa of *Andreaea* are given.

2226. **Vohra, J.N. & Wadhwa, B.M. 1966.** "*Merceyopsis angulosa* Broth. et Dix.– A new record for Western Himalaya". *Bull. Bot. Surv. India* 8: 355–356.

Abstract: *Merceyopsis angulosa* Broth. et Dix. has been recorded for the first time for Wesern Himalayas from Bagheshwar, Almora district. Earlier this species was reported from Sikkim.

2227. **Wadhwa, B.M. & Chowdhery, H.J. 1982.** "*Ipomoea pes-tigridis* L. var. *hepaticaefolia* (L.) C.B. Clarke– A new distributional record for Northern India". *Indian J. Forest.* 5(3): 241.

Abstract: *Ipomoea pes-tigridis* L. var. *hepaticaefolia* (L.) C.B. Clarke has been a new distributional record for Northern India from Robbers Cave (Dehra Dun) and Rupar (Punjab). Earlier it was reported from southern Deccan Peninsula and Sri Lanka.

2228. **Wang, Y.J., von Raab-Straube, E., Susanna, A. & Liu, J.Q. 2013.** "*Shangwua* (Compositae), a new genus from the Qinghai- Tibetan Plateau and Himalayas". *Taxon* 62(5): 984–996.

Abstract: A new genus of Compositae, *Shangwua*, is described to accomodate all species formerly placed in Saussurea sect. Jacea. This genus is distinct from the other genera of tribe Cardueae in its unique combination of states of characters including involucral bracts, receptacle, paleae, anther, style, achene and pappus. Phylogenetic analyses based on molecular data suggest that this new genus belongs to the Xeranthemum group, a lineage of the Carduinae that diversified early, with only distant relationships to *Saussurea* and related genera. The genus *Shangwua* consists of three species occurring in the Qinghai-Tibetan Plateau and Himalayas.

Endemism, IUCN Threat Status and Conservation

2229. **Agrawal, S. 1983.** Some rare Gentians. In: Jain, S.K. & Rao, R.R. (Eds.), *An Assessment of Threatened Plants of India*. Botanical Survey of India, Calcutta. Pp. 272–275.

2230. **Ansari, A.A. 1993.** "Threatened medicinal plants from Madhulia forest of Gorakhpur". *J. Econ. Taxon. Bot.* 17(1): 241.

Abstract: The present report describes five threatened medicinal plants viz., *Aristolochia indica* L., *Costus speciosus* (Koenig) Smith, *Curculigo orchioides* Gaertn., *Gloriosa superba* L. and *Rauvolfia serpentina* (L.) Benth. ex Kurz from Madhulia forest of Gorakhpur, U.P. which will be new and additional distribution area of collection of genetic stocks and their conservation.

2231. **Arya, D., Bhatt, D., Kumar, R., Tewari, L.M., Kishor, K. & Joshi, G.C. 2013.** "Studies on natural resources, trade and conservation of Kutki (*Picrorhiza kurroa* Royle ex Benth., Scrophulariaceae) from Kumaun Himalaya". *Scientific Res. & Essays* 8(14): 575–580.

Abstract: The present study deals with populations, trade and conservation aspect of *Picrorhiza kurroa*. It is a rare and endangered medicinal plant useful in curing many diseases. The study reveals poor relative density of the species in almost all the populations, suggesting the need of careful and immediate conservation of the plant. It is dubious that the species can perform well *ex-situ*, due to its narrow ecological range, and therefore *in-situ* conservation is the best option.

2232. **Arya, K.R. & Agarwal, S.C. 2006.** "Conservation of threatened medicinal and folklore plants through cultivation in Uttaranchal state". *Ethnobotany* 18: 77–86.

Abstract: Uttaranchal, northwestern part of India, comprises two hilly regions, Garhwal and Kumaon Himalayas, including the Tarai belts of Udham Singh Nagar, Haridwar and Dehra Dun. The state has international boundaries with Tibet in the north and Nepal in the east. In recent past, indiscriminate removal of medicinal plants, deforestation and rapid urbanization have caused continuous depletion of medicinal plant diversity. The present communication provides a list of 48 threatened plants of Uttaranchal and 34 important folklore therapeutic plants of commercial value. Mention is also made of government organizations, NGOs and local farmers engaged in cultivation of these plant species.

2233. **Bhatt, D., Kumar, R., Tewari, L.M. & Joshi, G.C. 2014.** "*Polygonatum cirrhifolium* Royle and *Polygonatum verticillatum* (L.) Allioni: Status assessment and medicinal uses in Uttarakhand, India". *J. Med. Pl. Res.* 8(5): 253–259.

Abstract: *Polygnatum verticillatum* (Linn) All. and *Polygonatum cirrhifolium* (Wall.) Royle (Liliaceae) growing in the Himalayan region is assigned as vulnerable by International Union for Conservation of Nature and Natural Resources (IUCN). To elucidate the status of the plants in the Uttarakhand Himalaya population assessment of the species is done in the study region. The study area is divided into five sites (Kilburry, Jageshwar, Dunagiri, Chaubattia and Aboot mount) in Kumaun division and five sites (Bhavisya Badri, Tangnath, Dayara, Bharsar and Binsor) in Garhwal division. Population is accessed based on frequency, density, abundance and importance value index (IVI) of the plants in per square meter area following Mishra (1986). Threat assessment of species was done through six parameters (that is, habitat preference, distribution range, population size, use pattern, extraction trend and native area. Ethno-medicinal uses of the plants are also documented through interview and gathering with local informers/folk healers. Some conservation strategies are also suggested.

2234. **Bhatt, V.P. & Rawat, D.S. 2020.** God's Tree: A culturally coded strategy for conservation (A case study of Gairsain Ecoregion of district Chamoli, Uttarakhand). In: Khasim S., Long C., Thammasiri K. & Lutken H. (Eds.), *Medicinal Plants: Biodiversity, Sustainable Utilization and Conservation*. Springer, Singapore, Pp. 237–247.

Abstract: This chapter presents a study of the holy trees of Gairsain eco-region of district Chamoli of Uttarakhand. These trees are regarded as god's tree and worshiped by the local inhabitants for propitiating the wishes of the latter. This is an implied technique of conservation and regeneration of ecologically and economically valued plants. A total of 18 tree species belonging to 14 genera of 11 families were recorded as god's trees in the 61 surveyed villages of the region. Nearly six trees per village

were found which are considered as god's trees and worshiped during the different occasions. *Quercus leucotrichophora, Prunus cerasoides, Celtis australis* and *Myrica esculenta* are some of the prominent god's trees. All gods' trees are highly valued in all domains of life. The data were collected through extensive and intensive interviews with olden local people and *pujaaris* or priests during 2014–2016. Unfortunately, all these trees and practices are under severe threat and diminishing in number in the process of modernization of culture.

2235. **Bisht, S. & Ghildyal, J.C. 2007.** "Conservation of sacred groves for biodiversity conservation in Uttarakhand Himalaya". *Curr. Sci.* 92: 711–712.

2236. **Biswas, S. 1988.** "Rare and threatened taxa in the forest flora of Tehri Garhwal Himalaya and the strategy for their conservation". *Indian J. Forest.* 11: 233–237.

2237. **Biswas, S. 2005.** Developing a floristic model for restoration of threatened biodiversity of North-Western and Central Himalaya. In: Rawat, J.K., Srivastava, S., Biswas, S. & Vashishta, H.B. (Eds.), *Proceedings of Workshop on Conservation of Biodiversity in India– Status, Challenges and Efforts.* ICFRE-FRI, Dehradun. Pp. 148–151.

2238. **Chandola, S. & Singh, S.K. 2003.** "Status and scope of medicinal plants in Bhagirathi valley of Garhwal– Conservation Strategy". *Indian Forester* 129(8): 950–963.

Abstract: Conservation of medicinal/aromatic plants and the environment will be possible only with the precondition that our political leadership and policy makers become alive to this problem and take some really strong decisions. Since the Forest Department has to play a major role in this initiative by virtue of being the dominant custodian of the natural resource of land and forest, it should be ready for a major altitudinal change in favour of an ecosystems approach to forestry. The public of Uttaranchal are the predominant stakeholders, and will have to assert themselves against the threat of grazing, pilferage and fire. Our scientists and NGOs also have to play a very important role in the strategy of *in-situ* and *ex-situ* revival of medicinal plants. In addition to the others, the industry is expected to adopt a role that is beneficial to all stakeholders. The Bhagirathi valley is endowed with a rich wealth of medicinal and aromatic plants ranging from sub tropical and alpine species. This invaluable resource is, however, under serious threat from severe depletion due to grazing, pilferage, fire and social indiscriminations in utilization. Eight mega centres for the conservation of medicinal plants have been suggested which need to be protected by establishment of MPCAs. This *in-situ* intervention needs to be closely dovetailed with *ex-situ* cultivation and conservation along with Eco Tourism as a major part of the strategy. In pursuance of this goal, seven medicinal plant gene repositories have been raised with over 200 important medicinal plant species. Other important issues closely related to the development of Uttaranchal as a herbal state are Research, for propagation and conservation, standardization of herbal produce, the need for strong regulations against unlawful removal from the forests, patenting of traditional knowledge and formulations, and, last but not least, the necessity to organize a transparent market. With proper planning and a concerted effort from all the stakeholders, specially the political leadership and the policy makers, Uttaranchal

stands a fair chance of garnering a major share of the national and international market of medicinal and aromatic plants.

2239. **Chandra, S. & Biswas, S. 1997.** "Rare and endangered plants of economic value: Indian Squill [*Ugenia indica* (Roxb.) Kunth]". *J Non-Timber Forest Prod.* 4: 129–132.

2240. **Chauhan, D.S., Negi, A.K., Chamola, B.P. & Todaria, N.P. 2011.** Van Panchayats: Community conserved areas in Uttarakhand. In: Gokhle, Y. & Negi, A.K. (Eds.), *Community Based Biodiversity Conservation in the Himalayas.* The Energy and Research Institute, New Delhi.

2241. **Deva, Som. 1968.** "A plant *(Eremostachys superba* Royle) in danger of extinction". *Cheetal* 2: 63–64.

2242. **Dhar, U. (Ed.). 1993.** *Himalayan Biodiversity Conservation Strategies.* G.B. Pant Institute of Himalayan Environment and Development, Almora.

2243. **Dhar, U. 2002.** "Conservation implications of plant endemism in high altitude Himalaya". *Curr. Sci.* 82: 141–148.

2244. **Dhar, U. & Samant, S.S. 1993.** "Endemic plant diversity in the Indian Himalaya I: Ranunculaceae and Paeoniaceae". *J. Biogeography* 20: 659–668.

Abstract: Himalyan Ranunculaceae and Paeoniaceae are analysed for their endemic diversity. Of the total 251 representative taxa of Ranunculaceae, seventy six (30.27%) are endemic to Indian Himalaya and most of these (forty four taxa) are confined to Trans- and North West Himalaya. In view of possessing remarkable endemic diversity and other attributes of sensitivity, *Aconitum, Delphinium, Anemone, Aquilegia* and the monotypic *Beesia, Coptis aind Paroxygraphis* need to be considered a focul groups of rioritised taxa for conservation. *Paeonia emodi* Wall. ex Royle, though a 'near-endemic', demands special attention for conservation.

2246. **Dhar, U., Rawal, R.S. & Samant, S.S. 1996.** "Endemic plant diversity in Indian Himalaya III: Brassicaceae". *Biogeographica* 72(1): 19–32.

2247. **Dixit, R.D., Kumar, R. & Vaish, U.S. 2004.** "Conservation of medicinal plants in the experimental garden of Botanical Survey of India, Central Circle, Allahabad". *J. Econ. Taxon. Bot.* 28(2): 335–338.

Abstract: The paper deals with *ex-situ* conservation of five important medicinal plants i.e. *Aloe barbadensis* (Ghee-Kunwar), *Asparagus racemosus* (Satavari), *Costus speciosus* (Keu), *Rauvolfia serpentina* (Sarpagandha) and *Withania somnifera* (Asgandha) which have already been decaled in the category of threatened/ rare species in Madhya Pradesh and Uttar Pradesh. A brief description of these plants with medicinal importance, conservation strategies, mode of application, etc. in experimental garden of Botanical Survey of India, Allahabad have been provided to encourage their conservation/multiplication.

2248. **Dobhal, R., Kumar, A. & Rawat, S. 2011.** Conservation and management of bio-resources in Uttarakhand, India. In: Gokhle, Y. & Negi, A.K. (Eds.), *Community Based Biodiversity Conservation in the Himalayas.* The Energy & Research Institute, New Delhi.

2249. **Farooquee, N.A. & Saxena, K.G. 1996.** "Conservation and utilization of medicinal plants in high hills of the central Himalayas". *Environm. Conserv.* 23(1): 75–80.

Abstract: Many high altitude regions of the world are still occupied by traditional communities of people, whose livelihood is closely related to a narrow base of locally available natural resources. A survey was conducted in 1991–1994 of two villages inhabited by Bhotiya tribal people in Dharchula block of Uttar Pradesh, India. Medicinal herbs (14 abundant species, with *Partitella ramitchadalis* accounting for >50% by weight) constitute 12–13% of total income to the villages. The harvest is conducted by children during August to October, around summer settlements (up to 4100 m altitude) to which the villagers annually migrate. Fifteen cooperatives with a 1992 membership of 7009 herb collectors and salespeople exist in the Dharchula block, and marketing is through two specialist government agencies. Conservation measures, including protected areas and banning of direct trade with purchasing companies, have not generally been successful; pressure on the plant populations has increased and there is evidence for decline in the resource. Cultivation appears to represent a viable option for the resource, and thus for the income of the traditional peoples who still depend on it.

2250. **Gaur, R.D. & Raiwani, S. 1995.** "A preliminary report on the threatened arborescent taxa of Garhwal Himalaya". *J. Indian Bot. Soc.* 74: 283–292.

Abstract: Forest ecosystems are of great concern to the environmentalist, on account of continuous deterioration of plant communities by exploitation, deforestation, loss of habitats and several developmental activities, etc. Himalayan region abounds diverse forest vegetation in different topographical limits, however, with the present trends, forest are not only depleted but a large number of elements are on verge of extinction, adversely affecting the biodiversity. Considering the facts, the present communication is an attempt to highlight the threatened arborescent species of Garhwal Himalaya.

2251. **Gaur, R.D., Rawat, D.S. & Dangwal, L.R. 1993b.** A status of vulnerable plant species from Garhwal Himalaya. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies*. G.B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora. Pp. 191–204.

2252. **Goel, A.K. 1992.** "Observations on habitats of some rare and threatened plants in Bhillangna valley of Tehri Garhwal". *J. Econ. Taxon. Bot.* 16(1): 193–198.

Abstract: Studies on the habitats and rarity of some rare and threatened plants viz.: *Meconopsis paniculata* Prain, *Corydalis crithmifolia* Royle, *Aphyllorchis parviflora* King & Pantl., *Cypripedium cordigerum* D. Don, *C. himalaicum* Rolfe ex Hemsley, *Galearis spathulata* (Lindl.) P.F. Hunt, *Gastrochilus distichus* (Lindl.) Kuntze, *Ponerorchis chusua* (D. Don) Soo, *Roscoea longifolia* Baker, *Allium jacquemontii* Kunth have been made in the present paper with their flowering and fruiting and distribution.

2253. **Goel, A.K. 2002a.** "*Ex-situ* conservation studies on some rare, endangered and endemic plant species at NBRI Botanic Garden". *Indian J. Forest.* 25(1): 67–78.

Abstract: Plant diversity is recognised universally as a vital part of world's natural heritage and most essential living source on this planet. They are considered as key component for the global sustainability. The present era has been of significant biological extinction due to loss of various habitats of plants arising primarily through

the human interference for his materialistic needs. It has been now serious realised that the conservation of plant diversity should be accorded topmost global priority under the biodiversity conservation programmes. In order to face the challenge towards threats to plant diversity, Botanic Garden have to play a leading role to conserve the plant resources during 21st century. The Botanic Gardens are developing fast as the important protectors of species of wild plants. The present communication deals with the *ex-situ* conservation studies in the Botanic Garden at NBRI, Lucknow.

2254. **Goel, A.K. 2002b.** "Conservation of *Welwitschia mirabilis* (Tree Tumbo) in Botanic Garden at NBRI, Lucknow". *Phytotaxonomy* 2: 166–170.

Abstract: *Welwitschia mirabilis* is a monogeneric species and belongs to the family Welwitschiaceae. It is native to South-West Africa and is commonly called "Tree Tumbo". This species has always been considered as a great bizarre of nature due to its unusual habit and appearance. As a result of its extraordinary academic and evolutionary significance in the plant kingdom, it possesses high conservational importance. This species is performing well under *ex-situ* conservation in NBRI Botanic Garden and is discussed in this paper.

2255. **Goel, A.K. & Bhattacharyya, U.C. 1983.** Rare flowering plants of Garhwal Himalaya. In: Jain, S.K. and Rao, R.R. (Eds.), *An Assessment of Threatened Plants of India*. Botanical Survey of India, Calcutta. Pp. 13–17.

2256. **Goel, A.K. & Jain, S.K. 1987.** "Some rare and very scarcely collected plants of India". *J. Econ. Taxon. Bot.* 9(1): 71–88.

Abstract: A brief review of work on endangered species of plants is given. Over 150 rare or scarcely collected species are enumerated. These include many rare plants collected after a long gap of several decades or even a century. A reference to the publication dealing with rediscovery, analysis or status of the species is given. This list at one place is aimed to help in locating in herbaria and gardens, recollection in field and cultivation and conservation of these rare or scarcely collected plants.

2257. **Goel, A.K., Sharma, S.C. & Rajendran, A. 1997.** "*Ex-situ* conservation of *Encephalartos* Lehm. (Zamiaceae) in Botanic Garden, National Botanical Research Institute, Lucknow (India)". *Indian J. Forest.* 20(3): 259–264.

Abstract: *Encephalartos* Lehm. an endemic genus of the South Africa, is evergreen and of great ornamental and academic significance. The species viz., *Encephalartos altensteinii, E. cycadifolius, E. ghellinckii, E. gratus, E. horridus, E. lebomboensis, E. longifolius, E. princeps, E. transvenosus, E. trispinosus* and *E. villosus* are being nurtured under the *ex-situ* conservation in the NBRI Botanic Garden. The available literature and published reports reveal that it is a rare and endangede genus and included in the list of CITES appendices I & II. The need to conserve the *Encephalartos* species under the *ex-situ* conditions is stressed and highlighted in the present communication.

2258. **Goel, C.L. 1993**. "Conservation of medicinal plant resources in Himalayas (India)". *Indian Forester* 119(12): 970–976.

Abstract: The Himalayas are a rich source of medicinal plants which have generated tremendous scope of employment opportunities for local inhabitants apart from their role in health care system of the country and other socio-economic and environmental

impact on not only the local population of these natural resources over several decades has brought us to the verge of loosing some of these precious heritage thereby also contributing to the general disintegration of our environment. The present article is an attempt to highlight the role these resources play in our daily life and national economy; the need to conserve these resources, and these strategies for such conservational action at the national and individual level.

2259. **Hajra, P.K. 1983.** "Rare, threatened and endemic plants of the Western Himalaya-Monocotyledons". *Pl. Conserv. Bull.* 4: 1–13.

2260. **Hajra, P.K. 1987.** Threatened, rare and endangered orchids of the hill districts of Uttar Pradesh and their conservation status. In: Pangtey, Y.P.S. & Joshi, S.C. (Eds.), *Western Himalaya* 2: *Problems and Development*. Gyanodaya Prakashan, Nainital. Pp. 669–677.

2261. **Irwin, S.J. & Narasimhan, D. 2011.** "Endemic genera of Angiosperms in India: A review". *Rheedea* 21(1): 87–105.

Abstract: This is an earnest effort to review the earlier recorded endemic genera of angiosperms in India and assess those present within the political boundaries of India. It is concluded that only 49 genera are endemic to India, of which 36 are unispecific. Peninsular India has a high concentration of endemic genera (40 genera). Four are confined to Indian Himalaya and three to Andaman & Nicobar Islands. Genus *Hardwickia* is widely distributed in the dry deciduous forests of Peninsular and North India, excluding Northeast India. *Bentinckia* which is distributed in Peninsular India and Nicobar Islands is the only genus with disjunct distribution. About 71% of the genera are herbaceous and their concentration is more in wet evergreen forests and grasslands. Threat assessment has not been made for majority of the species of these genera. There is an urgent need for an assessment based on current IUCN Criteria.

2262. **Jalal, J.S. 2008.** Conservation of a Rare Orchid *(Cypripedium cordigerum)* in Nagtibba (Western Himalaya), India. Technical Report. Wildlife Institute of India (WII), Dehradun and SDCOS, USA.

2263. **Jalal, J.S. 2012.** "Status, threats and conservation strategies for orchids of Western Himalaya, India". *J. Threatened Taxa* 4(15): 3401–3409.

Abstract: The present study is an attempt to give an account of the current status of orchids based on recent surveys since 2002 to 2010 in various parts of western Himalaya. Based on rarity Index of species, orchids are categorised in four groups, very rare, sparse, occasional and common. Results show that 40% of orchid species are very rare, 26% are sparse, 19% are occasional and 15% are common in western Himalaya. For the conservation of orchids, two orchid conservation areas are identified in Gori Valley and Mandal Valley.

2264. **Jalal, J.S., Kumar, P. & Rawat, G.S. 2009.** "Conservation of a rare Lady's Slipper Orchid (*Cypripedium cordigerum* D. Don) in Uttarakhand, Western Himalaya". *McAllen Int. Orchid Soc. J.* 10(2): 12–16.

2265. **Jalal, J.S., Kumar, P., Tewari, L.M. & Pangtey, Y.P.S. 2009a.** "Conservation status of the endemic orchid *Peristylus kumaonensis* Renz. (Orchidaceae) of Western Himalaya, India". *Nature & Sci.* 7(5): 86–89.

Abstract: *Peristylus kumaonensis* Renz is an endemic taxon of western Himalayas. It is found in the outer fringe of the Kumaun Himalayas 5 km away from Nainital towards Ratighat. The orchid species appears to be restricted to this area according to past and the present surveys. Major threats to the existence of this species are due to habitat fragmentation, forest fire and might be the invasion of a fern species *Phytopteris oxyloba*. This species is of conservation concern because of its low numbers of individuals and restricted distribution in the western Himalayas.

2266. **Joshi, G.C., Tiwari, K.C., Tiwari, R.N. & Uniyal, M.R. 1991.** "Conservation and large scale cultivation strategy of Indian Ginseng– *Panax pseudoginseng* Wall.". *Indian Forester* 117(2): 131–134.

Abstract: *Panax pseudoginseng* Wall. is an small perennial herb of family Araliaceae, popularly known as 'Ginseng' is an important medicinal plant used for various diseases. Its tuberous roots are the chief source of Chinese miraculous drug 'Sanchi'. It is scarcely found in temperate regions of Bhutan, Sikkim, Nepal and China. It is an endangered species and verge of extinction. But its cultivation has not been taken up till now. Recently it has been collected for the first time by authors from the temperate to alpine region of district Pithoragarh, U.P. It can be cultivated by seedlings raised from seed or from wilding. It is a good source of income for the people living in the interior hills and needs conservation in natural habitat.

2267. **Joshi, K., Gobbur, A. & Dumbre, S. 2017.** "Conservation status of *Pittosporum eriocarpum* (Cheesewood of Doon) in Uttarakhand". *J. Non-Timber Forest Prod.* 24(3): 127–130.

Abstract: The combination of global warming and habitat destruction is the sole reason for the disappearance of many plants from earth's surface. *Pittosporum eriocarpum* is also one among many other species which is at the verge of extinction. Based upon an extensive survey during 1997-98 in the state of Uttarakhand, the occurrence of *Pittosporum eriocarpum* is rated as endangered. This study gives focus on the present status and conservation strategies regarding *Pittosporum eriocarpum*.

2268. **Kala, C.P. 2000.** "Status and conservation of rare and endangered medicinal plants in the Indian trans-Himalaya". *Biol. Conserv.* 93: 371–379.

2269. **Kala, C.P. 2003.** "Commercial exploitation and conservation status of high value medicinal plants across the borderline of India and Nepal in Pithoragarh". *Indian Forester* 129(1): 80–84.

Abstract: Across borderline of Nepal and India in the Jhulaghat region of Pithoragarh district (Uttaranchal), a total of 16 medicinal plants were documented during the present survey, which are in trade for commercial purpose. Most of these medicinal plants are being collected from the Baitedi district of Nepal and the supplied to the India via Jhulaghat and Dharchula. Reetha (*Sapindus mukorosii*) was traded

commercially in highest quantity (about 4,000 qtls.) during 2001-2002. Six species of rare and endangered categories were also collected from Baitadi district for sale in India, inspite of the total ban on their collection for commercial purpose. Based on the survey and findings, various conservation and management steps have been discussed to protect the medicinal plants and also for future course of action.

2270. **Kala, C.P. 2004a.** "Pastoralism, plant conservation, and conflicts on proliferation of Himalayan knotweed in high altitude protected areas of the Western Himalaya, India". *Biodiv. & Conserv.* 13(5): 985–995.

Abstract: The conservation policy of banning pastoral grazing, and subsequently emerging conflicts between conservationists and pastoral communities regarding the proliferation of Himalayan knotweed (*Polygonum polystachyum*), was studied in the Valley of Flowers National Park, a high altitude protected area of the Western Himalaya, India. A total of 10 habitat types identified in the study area were sampled using quadrats along an altitudinal gradient between 3000 and 4500 m. Plant species richness decreases with altitude and also varies across habitat types. The highest density of *P. polystachyum* and its associated species, *Impatiens sulcata*, was found between 3300 and 3500 m in the disturbed habitat types, *viz*., bouldery areas, fragmented treeline zone, avalanche-prone areas and eroded slopes. Eradication of *P. polystachyum* from the national park by managers is not going to serve any meaningful purpose to the long-term conservation; rather it initiates soil erosion and instability, hindering the establishment of natural plant communities.

2271. **Kala, C.P. 2004b.** "Assessment of species rarity". *Curr. Sci.* 86: 1058–1059.

2272. **Kala, C.P. 2010.** "A multifaceted review on the biodiversity conservation of the Valley of Flowers National Park, Western Himalaya". *Int. J. Biodiv. Sci. & Manage.* 1(1): 25–32.

Abstract: The Valley of Flowers National Park (VOF) in the Uttaranchal Himalaya is renowned for its marvellous display of flowering plants and its scenic beauty. For the past two decades it has been caught in a controversy over policies designed to protect the region's botanical diversity and scenic beauty from livestock grazing. The present analysis reviews similar research carried out in the VOF and in its fringes. This multifaceted review indicates that the VOF harbours 520 vascular plant species, 13 large mammals and 40 bird species. Of the 24 plant community types of the VOF, *Polygonum polystachyum* – mixed forb community type (the centre of present conservation controversy due to increasing comments on its proliferation after imposing a ban on livestock grazing in the VOF) is restricted to the disturbed habitat types. The manual removal of *P. polystachyum* from the VOF by the Forest Department has led to an advance in the *Impatiens sulcata*– mixed forb community type and the generation of biodegradable waste. The comparative analysis of floral diversity of the VOF and its adjacent grazed alpine meadows reveals that effect of migratory livestock grazing is species-specific, and that species diversity of natural herbaceous communities does not depend on livestock grazing.

2273. **Kala, C.P., Rawat, G.S. & Mukherjee, S.K. 2001.** Prospects for the *ex-situ* conservation of wild medicinal plants in and around Bhyundar valley, Garhwal Himalaya. In: Samant, S.S., Dhar, U. and Palani, L.M.S. (Eds.), *Himalayan Medicinal Plants: Potential and Prospects*. Gyanodaya Prakashan, Nainital. Pp. 547–559.

2274. **Kala, C.P., Rawat, G.S. & Uniyal, V.K. 1997.** Ecology and conservation of the Valley of Flowers National Park. Technical Report- RR-98/003. Wildlife Institute of India (WII), Dehradun.

2275. **Kala, C.P., Rawat, G.S. & Uniyal, V.K. 2001.** Human use and conservation status of wild medicinal herbs in Bhyundar valley, western Himalaya. In: Pande, P.C. & Samant, S.S. (Eds.), *Plant Diversity of the Himalaya*. Gyanodaya Prakashan, Nainital. Pp. 556–557.

2276. **Kandpal, V. 2010.** *Evaluating Threatened Species in relation to Anthropogenic Pressure and their Management Strategy in Nanda Devi Biosphere Reserve, Western Himalaya.* Ph.D. Thesis. Forest Research Institute (FRI) Deemed University, Dehradun. (unpublished).

2277. **Khanna, K.K. 2001.** "Endemic plants of Uttar Pradesh (Angiosperms)". *Phytotaxonomy* 1: 71–75.

Abstract: An enumeration of 119 taxa of flowering plants endemic in Uttar Pradesh has been dealt with in the paper. An analysis indicates that 10 taxa are confined to plains and the rest of the taxa to the northern hilly region. Further, the families Fabaceae and Poaceae have the highest number of endemic taxa, i.e. 17. On the other hand, the genus *Spiraea* has the maximum number of endemic taxa, i.e. 5. It is interesting to note that three genera, *Kedarnatha*, *Ivanjohnstonia* and *Microschoenus*, are endemic in Uttar Pradesh.

2278. **Kumar, A. & Lal, J. 2006.** "*Ex-situ* conservation of *Amorphophallus longiconnectivus* Bogner (Araceae)– An endemic and rare species". *J. Econ. Taxon. Bot* 30(1): 161–163.

Abstract: The paper deals with *ex-situ* conservation of *Amorphophallus longiconnectivus* Bogner in the Experimental Botanic Garden of the Central Circle, Botanical Survey of India, Allahabad. Short description of the species has been provided.

2279. **Kumar, M., Sheikh, M.A. & Rajwar, G.S. 2010.** "Conservation strategies for *Anogeissus latifolia* in the Srinagar valley of Uttarakhand, India". *Int. J. Conserv. Sci.* 1(4): 191–198.

Abstract: The present article focuses on the various disturbance agents such as fire, grazing and browsing, over-exploitation of resources, dam constructions, road constructions etc., affecting the growth of *Anogeissus latifolia* in the Srinagar valley of Uttarakhand. *A. latifolia* is the prominent tree species of this valley and is an important source of fuel, fodder, timber and other basic uses for the local villagers. The inevitable pressure on the *A. latifolia* is leading to severe destruction of the species and may create the scarcity of that species in the near future. Therefore, joint efforts need to be implemented by the local villagers with government agencies for conservation and sustainable use of *A. latifolia*. The government may also take an initiative by allotting demarcated forests areas to the villagers as village forest, thus motivating the villagers to take special care for its protection and rehabilitation and for a sustainable output.

2280. **Kumar, R., Chandra Sekar, K. & Arya, D. 2020.** "Ecological and conservation status of high-altitude medicinal plant: *Dactylorhiza hatagirea* (D. Don) Soo in Pindari Valley, Western Himalaya". *Int. J. Bot. Stud.* 5(5): 4–7.

Abstract: The present study was conducted to evaluate the current status, population density and availability of *Dactylorhiza hatagirea* in different microhabitat. This work also focused on the threat and conservation status. The population density of *Dactylorhiza hatagirea* was ranged from 0.2-0.9 ind/m^2. According to the microhabitats, the density of *Dactylorhiza hatagirea* was varied in the present study sites. In the open grass land habitats the highest recorded density was (0.9 ind/m^2) whereas disturb/waste land was contained least density (0.2 ind/m^2). A total of 58 plant species belonging to 51 genera and 31 families were recorded from the different microhabitats. We found that, the least density of *Dactylorhiza hatagirea*, because of some major factors like over exploitation for mainly local uses and trade, unsustainable grazing and trampling as well as the higher density of weedy and invasive species in the present study area.

2281. **Lohani, N., Tewari, L.M., Joshi, G.C., Kumar, R., Kishor, K. & Upreti, B.M. 2013.** "Population assessment and threat categorization of endangered medicinal orchid *Malaxis acuminata* D. Don from North-West Himalaya". *Int. J. Conserv. Sci.* 4(4): 483–490.

Abstract: Studies on population assessment and threat categorization in selected populations of *Malaxis acuminata* D. Don., a rare, terrestrial, endangered medicinal orchid of Himalayan region and an important "Astverga" plant were undertaken. Status was determined on site-to-site basis as well as for entire Kumaun region. Based on species occurrence in selected areas, the species were identified as critically endangered to endangered in different sites studied. The results also revealed that natural distribution of the species was narrowing down due to habitat destruction and over exploitation. Immediate remedial measures are needed for the conservation of natural sites to ensure sustainable mode of utilization.

2282. **Maheshwari, J.K. 1982.** Some thoughts on the endangered flora of the Himalayas. In: Paliwal, G.S. (Ed.), *The Vegetational Wealth of the Himalayas*. Puja Publishers, New Delhi. Pp. 256–268.

2283. **Maliya, S.D. 2007.** "Rare species of Katarniyaghat Wildlife Sanctuary, district Bahraich, Uttar Pradesh, India". *Indian Forester* 133(8): 1052–1056.

Abstract: The paper presents a local assessment of rare species of Katarniyaghat Wildlife Sanctuary of district Bahraich, Uttar Pradesh. Taking regular visits in different seasons, 41 41 rare species have been recorded in the sanctuary region. Twenty three species of the total number of rare species have a wide range of Ayurvedic and Ethnomedicinal uses. Remaining 18 species are economically valuable and frequently used by local inhabitants for their day to day requirements.

2284. **Mamgain, S.K., Goel, A.K. & Sharma, S.C. 1998.** "Conservation assessment of some Important threatened plants of India". *J. Non-Timber Forest Prod.* 5: 1–9.

2285. **Manikandan, R. & Srivastava, S.K. 2015a.** "Diversity, medicinal and threatened plants in Govind Pashu Vihar Wildlife Sanctuary, Western Himalaya". *Indian Forester* 141(9): 966–973.

Abstract: The paper deals with information on floristic composition of the Givind Pashu Vihar Wildlife Sanctuary comprising 821 species, 8 subspecies, 11 varieties and a few cultivated species of angiosperms, distributed over 479 genera and 125 families, of these 9 species are critically endangered, 14 species are endangered, 9 species are vulnerable and 7 species are Least Concern. In addition, medicinal plants which form the basis for certain life saving drugs have also been incorporated.

2286. **Manikandan, R. & Srivastava, S.K. 2015b.** "Threatened medicinal plants protected *in situ* in Govind Pashu Vihar Wildlife Sanctuary, Western Himalaya". *Phytotaxonomy* 15: 90–95.

Abstract: The paper deals with the information on threatened medicinal plants of the Govind Pashu Vihar Wildlife Sanctuary, comprising 39 species of Angiosperms, of which 10 species are critically endangered, 13 species endangered, 9 species vulnerable and 7 species Least Concern. All these threatened medicinal species are provided in a list along with family and local names followed by habit, habitat, altitude, phenology, parts used and their status.

2287. **Mathur, A. & Joshi, H. 2014.** "Diversity of the native and endemic species of Tarai region in Kumaun, Uttarakhand". *Indian Forester* 140(2): 180–183.

Abstract: The present study is an attempt to explote the native and endemic plant species of tarai region of Kumaun Himalaya of Uttarakhand. The study sites include tarai area around Lalkuan in district Nainital and Pantnagar and Kichha tehsil in district Udhamsingh Nagar. The region is also characterised now with settlements of human beings of different culture from different places. During the study period it was found that the percentage of native species was 19.11 and endemic 2.09. Representation of 78.80% on non-native species and very low percentage of native and endemic plant species in the study area indicated the high degree of disturbance due to anthropogenic pressure.

2288. **Mathur, A. & Joshi, H. 2015.** "Conservation priorities, necessity in the Tarai region of Kumaun, Uttarakhand". *Indian J. Forest.* 38(2): 1297–133.

Abstract: A threatened species is any plant or animal species that is at risk of extinction. The present study was conducted in terai region of Kumaun, Uttarakhand between the years 2008 to 2011 in three different sites and eight communities. During the study it was found that 28 plant species belonged of threatened categories. The present study concluded that, conservation is urgent necessity in this area.

2289. **Mudaiya, R.K., Joshi, G.C. & Pandey, N.K. 1995.** "Status of some vulnerable plant species from Ranikhet (Kumaon Himalaya)". *J. Econ. Taxon. Bot.* 19(3): 663–666.

Abstract: The paper enumerates 11 species of angiosperms and 3 species of pteridophytes which are vulnerable from the conservation point of view and therefore, these species have been suggested for conservation.

2290. **Nayar, M.P. & Ahmedullah, M. 1985.** "*Catamixis baccharoides* Thorns.– An endemic chasmophyte of the W. Himalaya under threat". *Bull. Bot. Surv. India* 27: 248–250.

Abstract: The genus *Catamixis* is monotypic, its component species (C. *baccharoides* Thoms.) is endemic to the Western Himalaya, confined to the narrow range in the Siwalik belt and Tehri district of Garhwal. This rare plant could well be on the verge of extinction by the run of this century, threatened by indiscriminate mining and quarrying operations being carried out in its natural range of distribution.

2291. **Negi, C.S. 2012.** "Culture and Biodiversity Conservation: A Case studies from Uttarakhand, Central Himalaya". *Indian J. Tradit. Knowl.* 11(2): 273–278.

Abstract: Cultural diversity is closely linked to biodiversity. The study of these interrelationships need to be studied mainly for the simple reason that culture is not only the ethical imperative for development, it is also a condition of its sustainability; for there exists a symbiotic relationship between habitats and cultures, between ecosystems and cultural identity, and that this relationship constitutes a determining factor in ensuring sustainable human development. The association of religion with eco-system management is interwoven in the symbolic network of the Himalayan traditional communities. Infact no one can think of ecology in the Himalaya without religion. The present study deals with the study of sacred natural sites (forests/groves, pastures, water bodies) along with the phenomenon of dedication of the forests to a deity, and the inherent taboos with regard to the resource exploitation and other traditional beliefs and customs being practiced in the Central Himalaya, and attempts to bring out the inherent environmental principles behind these practices.

2292. **Negi, K.S. & Gaur, R.D. 1991a.** "Little known endemic wild *Allium* species in the Uttar Pradesh hills". *Mount. Res. & Develop.* 11(2): 162–164.

2293. **Paliwal, G.S. & Singh, S. 1987.** Some aspects and prospects of plant conservation in Garhwal Himalaya. In: Pangtey, Y.P.S. & Joshi, S.C. (Eds.), *Western Himalaya II: Problems and Development*. Gyanodaya Prakashan, Nainital. Pp. 678–683.

2294. **Palni, L.M.S. 1993.** Conservation of Plant Genetic Resources. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies*. Gyanodaya Prakashan, Nainital. Pp. 481–496.

2295. **Pangtey, Y.P.S. & Samant, S.S. 1988a.** Observations on the threatened, rare and endangered flowering plants and ferns in the flora of Kumaun Himalaya. In: Ram Prakash (Ed.), *Advance in Forestry Research in India*. International Book Distrib., Dehradun. Pp. 65–74.

2296. **Panwar, G.S., Kumar, A. & Srivastava, S.K. 2014.** "*Indopiptadenia oudhensis* (Brandis) Brenan– An endangered tree species: Measures for the conservation". *Indian J. Forest.* 37(1): 69–72.

Abstract: *Indopiptadenia oudhensis* (Brandis) Brenan is an endangered tree species of family Mimosaceae. Species is mainly distributed at tropical and sub-tropical regions of Uttar Pradesh particularly in the foot-hills of Himalayas in the close vicinity to the territory of Nepal such as Balrampur, Gonda, Bahraich, Gorakhpur districts of U.P. and above Brahmdeo and Tanakpur in Eastern Kumaun of Uttarakhand and facing threats such as anthropogenic pressure, habitat destruction, over exploitation, low seed viability and poor seed germination.

2297. **Prakash, A. & Singh, K.K. 2001.** "Observations on some threatened plants and their conservation in Rajaji National Park, Uttaranchal, India". *J. Econ. Taxon. Bot.* 25(2): 363–366.

Abstract: The habitat loss due to developmental programmes, overgrazing, animal husbandary, and tourism has resulted in the loss of biodiversity. The natural causes like floods, earthquake, and landslides also add to this tragedy. Some of the endangered species have particularly suffered due to lack of effective pollinators, viable seed formation and natural regeneration, disease etc. resulting in the depletion and erosion of the genetic diversity in them. The paper brings to light such taxa which are endangered in the park. The record of collection and the present status of nine such taxa of the park has been provided. Some of the rare and threatened species of the park are: *Mitreola petiolata, Pygmaeopremna herbacea, Primula umbellate, Costus speciosus, Eremostachys superba, Catamixis baccharoides, Euphorbia fusiformis. Drimia indica, Rauvolfia serpentina* which have been discussed in this paper along with their conservation measures.

2298. **Prasad, S.N., Ramchandra, T.V., Ahalya, N., Sengupta, T., Kumar, A., Tiwari, A.K., Vijayan, V.S. & Vijayan, L. 2002.** "Conservation of Wetlands of India– A review". *Trop. Ecol.* 49(1): 173–186.

2299. **Pundir, Y.P.S. 2002.** "Conservation and propagation of three endemic endangered and rare plant species of Saharanpur-Shiwaliks, Doon valley and lower Mussoorie forests". *ENVIS Bull. Himal. Ecol. & Develop.* 10(1): 53–54.

2300. **Rana, T.S., Datt, B., Saklani, A. & Rao, R.R. 2004.** "Endemic and endangered taxa of Compositae in Western Himalaya, India". *J. Econ. Taxon. Bot.* 28(1): 25–30.

Abstract: The western Himalayan biogeographic zone is the richest zone in India for Compositae and supports *ca* 540 species. The distribution and density pattern of some of these species over recent decades reveals a perceptible decline in their populations. An account of such endemic and endangered species is provided here which includes their status, distribution pattern and causes of threats, etc.

2301. **Rawat, D.S. 2012.** "An angiosperm genus *Dipcadi* Medik. (Asparagaceae) need conservation". *Oaks* 8: 43–48.

2302. **Rawat, D.S. & Gaur, R.D. 2007.** Threatened alpine flora of Garhwal Himalaya, India. In: Trivedi, P.C. (Ed.), *Global Biodiversity: Status and Conservation.* Pointer Publishers, Jaipur. Pp. 169–192.

2303. **Rawat, G.S. 1994.** Protected Areas and Conservation of Rare Endemic Plants in the Himalaya. In: Pangety, Y.P.S. & Rawal, R.S. (Eds.) *High Altitudes of the Himalaya: Biogeography, Ecology and Conservation.* Gyanodaya Prakashan, Nainital. Pp. 88–101.

2304. **Rawat, G.S. & Adhikari, B.S. 2009.** Protected Area Network in the Himalayan Region and its efficacy in Biodiversity Conservation. In: Rawat, M.S.S. & *al.* (Eds.), *Management Strategies for the Indian Himalaya: Development and Conservation.* Transmedia, Srinagar. Pp. 74–93.

2305. **Rawat, G.S. & Chandola, S. 2007.** "Conservation status of medicinal and aromatic plants in the alpine meadows of Uttarakhand". *Proceedings of Herbal Expo, Uttarakhand.* Pp. 27–31.

2306. **Rawat, G.S. & Uniyal, V.K. 1993.** "Pastoralism and plant conservation: The Valley of Flowers dilemma". *Environm. Conserv.* 20(2): 164–167.

Abstract: This short communication addresses the problems of pastoralism and plant conservation in the valley of Flowers, one of the few protected areas of India that is maintained primarily for plant conservation. Management suggestions and the need for long-term research and monitoring are stressed.

2307. **Rawat, G.S., Chundawat, R.S. & Sathyakumar, S. 1996.** Conservation planning and management of Protected Areas in the Himalaya. In: Ramakrishnan, P.S. & *al.* (Eds.), *Conservation and Management of Biological Resources in the Himalaya.* G.B. Pant Institute of Himalayan Environment and Development, Almora. Pp. 69–84.

2308. **Rawat, J.K. & Sharma, S.K. 1992.** "Conservation of biological diversity in the Garhwal Himalayas". *Indian Forester* 118(5): 352–360.

Abstract: Biological diversity in the Garhwal Himalaya has been described highlighting the endangered species of flora and fauna there. Various conservation efforts in progress in the region, grouped under (i) habitat and species protection, (ii) legislation and (iii) public awareness and voluntary agencies have been reported. Some suggestions for promoting biodiversity conservation have also been put forward.

2309. **Samant, S.S., Dhar, U. & Rawal, R.S. 1993.** Botanical Hot Spots of Kumaun Himalaya: Conservation Perspectives. In: Dhar, U. (Eds.), *Himalayan Biodiversity Conservation Strategies.* Gyanodaya Prakashan, Nainital. Pp. 377–400.

2310. **Samant, S.S., Dhar, U. & Rawal, R.S. 1996.** Conservation of rare and endangered plants: The context of Nanda Devi Biosphere Reserve. In: Ramakrishnan, P.S. (Ed.), *Conservation and Management of Biological Resources in Himalaya.* G.B. Pant Institute ofHimalayan Environment and Development, Kosi-Katarmal, Almora and Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi. Pp. 521–545.

2311. **Samant, S.S., Dhar, U. & Rawal, R.S. 2000.** "Assessment of fuel resource diversity and utilization patterns in Askot Wildlife Sanctuary in Kumaun Himalaya, India, for conservation and management". *Environm. Conserv.* 27(1): 5–13.

Abstract: A general decrease in abundance of wild plant species used as sources of fuel suggests that more detailed information is urgently needed on species-level trends and their conservation. Such studies have not been carried out so far in India and elsewhere; we therefore quantified the species-wise extraction of fuel from a site (Gori Ganga Valley) in Askot Wildlife Sanctuary in the Kumaun Himalaya. In all, 31 species (26 trees and 5 shrubs) were used as fuel, of which 14 were native to the Himalaya. Utilization patterns, distributions, probabilities of use (PU), resource use indices (RUI), preferences and availabilities in forest communities of these species were determined. Use pattern did not vary much amongst low altitude villages (Similarity: 52–74%), whereas along the vertical (elevational) gradient it varied considerably (Similarity: 15–31%). *Woodfordia fruticosa* (L.) Kurz, *Pinus roxburghii* Sarg., *Quercus leucotrichophora* A.Camus, *Macaranga pustulata* King ex Hk. f., *Quercus*

lanuginosa Don, *Engelhardtia spicata* Bl. and *Mallotus philippensis* (Lamk.) Muell. contributed most to collections, while *Pyracantha crenulata* (Don) Roem., *Syzygium cuminii* (L.) Skeels, *Alnus nepalensis* Don and *Bauhinia vahlii* Wt. & Arn. were in lesser demand. *W. fruticosa, P. roxburghii, M. pustulata, Casearia elliptica* Willd., *E. spicata, M. philippensis, Q. leucotrichophora* and *Phoebe lanceolata* (Nees) Nees showed high values of PU and RUI, indicating high pressure. High density of *P. roxburghii, Rhododendron arboreum* Sm., *Q. lanuginosa, Q. leucotrichophora, Lyonia ovalifolia* (Wall.) Drude, *C. elliptica* and *M. pustulata* amongst trees and *Maesa indica* A. DC., *P. crenulata* and *W. fruticosa* amongst shrubs exhibited high density but the remaining species showed low density indicating their possible depletion. Intensive management of natural habitats of species highly-preferred for fuel, diversification of choice of species from natives to non-natives, large scale propagation of highly preferred taxa and plantation of seedlings in the degraded, uncultivated and marginal lands through peoples' participation should promote conservation and management of fuel resources.

2312. **Samant, S.S., Rawal, R.S. & Dhar, U. 1993.** Botanical Hot spots of Kumaun: Conservation perspective for the Himalaya. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies*. Gyanodaya Prakashan, Nainital. Pp. 377–400.

2313. **Sharma, J., Gaur, R.D. & Painuli, R.M. 2011.** "Conservation status and diversity of some important plants in the Shiwalik Himalaya of Uttarakhand, India". *Int. J. Med. Aromat. Pl.* 1(2): 75–82.

Abstract: The Shiwalik Himalaya of Uttarakhand is rich in its floristic composition. It also represents varied population of forest dwellers, locales, and tribal communities which play a vital role in social, cultural, historical, economic and industrial development of any country and in maintaining its ecological balance. Traditionally the folk people and the locales utilize the vegetation of their ambient environment in form of different products as food, fodder, fuel, medicine, fibre, timber etc. Among these useful species most of them are commercially exploited by drug dealers and at present many of such species come in threat categories. Therefore, there is an urgent need for conservation of such species for sustainable development. The members of threatened taxa belong to different families as Acanthaceae, Aceraceae, Asteraceae, Berberidaceae, Caryophyllaceae, Dioscoreaceae, Fabaceae, Hypoxidaceae, Lamiaceae and Liliaceae etc. The present study provides comprehensive information on the diversity, conservation status and utilization of plants in Shiwalik Himalaya.

2314. **Sharma, S., Rikhari, H.C. & Palni, L.M.S. 1999.** "Conservation of natural resources through religion: A case study from Central Himalaya". *Soc. & Nat. Resources* 12(6): 599–612.

Abstract: This study explores the method early settlers in the Central Himalayan region used to develop/adopt an indigenous system for conservation of bioresources. Most of the commonly used tree species were protected/planted in sacred groves. All protected species were located within the boundaries of worship points in village settlements. Today the "protected resource" does not enjoy the same status outside the boundary of the temple or worship point. Thus, it appears that early settlers established these religious points as in situ germplasm preservation/collection centres to conserve natural resources, sustain the daily requirement of villagers, and provide the ''elite'' stock material for multiplication. This innovative and intelligent practice has been an effective means of conservation, in total harmony with the environment, and seems to have persisted through generations.

2315. **Singh, A. 2007.** "*Boerhaavia diffusa*: An over-exploited plant of medicinal importance in eastern Uttar Pradesh". *Curr. Sci.* 93(4): 446.

2316. **Singh, G. & Rai, I.D. 2007.** Threatened Plants of Kedarnath Wildlife Sanctuary. In: Rawat, G.S. (Ed.), ENVIS BULLETIN - *Special Habitats and Threatened Plants of India*. Wildlife Institute of India (WII), Dehradun. Pp. 51–54.

2317. **Singh, G., Padalia, H., Rai, I.D., Bharti, R.R. & Rawat, G.S. 2016.** "Spatial extent and conservation status of Banj oak (*Quercus leucotrichophora* A. Camus) forests in Uttarakhand, Western Himalaya". *Trop. Ecol.* 57(2): 255–262.

Abstract: We assessed the conservation status of *Quercus leucotrichophora* (banj oak) forests and identified priority areas for its conservation in Uttarakhand state, India. The methods include mapping by using satellite remote sensing, and phytosociological analysis of dense, open and degraded banj oak forests in different elevational zones in the state. Mapping of banj oak forests was done using IRS P6 AWiFS satellite data in conjunction with altitude information and field knowledge. Canopy density information was generated based on Normalised Vegetation Difference Index (NDVI). Structure, composition and species diversity were quantified within 510 stratified random sample plots distributed in various elevation gradients. The study revealed that banj oak forests constitute 5.24 % (1284 km2) of total forest cover in the state (45.80 %). Of this, 775 km2 area falls within reserve forests while 509 km2 falls in village and private forests. Middle elevation range (1800-2200 m asl) represented maximum area (951.7 km^2) under banj oak. Area under dense, open and degraded banj oak forests was estimated at 560.3, 510.62 and 213.68 km^2, respectively. The greatest banj oak tree density was found in dense forests (479 $\pm$ 22.35 individual ha-1) between 1500-1800 m asl and lowest in degraded banj oak forests (46 $\pm$ 19.86 individual ha^{-1}) above 2200 m asl. Mean sapling (585 $\pm$ 51 individual ha^{-1}) and seedling (368 $\pm$ 37 individual ha^{-1}) density across various forests showed that regeneration is adequate with respect to the mean tree density (337$\pm$13.6 individual ha^{-1}) in western Himalaya. Most of the intact banj oak forests in the state occurred between 1800-2200 m elevations.

2318. **Singh, H. 2005a.** "*Ex-situ* conservation of rare medicinal plants in Govt. Garden Chaubatia (Ranikhet), district Almora, Uttaranchal". *Ann. Forest.* 13(2): 291–298.

Abstract: The present communication deals with 48 rare medicinal plant species belonging to 42 genera under 24 families, which are being conserved and cultivated in the Govt. Garden Chaubatia (Ranikhet), district Almora, Uttaranchal. In this enumeration botanical name, family, common name, flowering period, fruiting period, suitable agro-climatic range, propagules, recommended period of sowing/propagation along with useful parts and medicinal uses for each species have been given.

2319. **Singh, H. 2005b.** "*Bergenia ciliata* (Haw.) Sternb.– A rare promising medicinal plant needing conservation and cultivation". *BSI ENVIS Newsletter* 10(1-2): 12–13.

2320. **Singh, M.P., Narayan, J. & Singh, T.N. 2012.** "Conservation of highly exploited medicinal plants of Vindhyam range (U.P.)". *Indian J. Sci. & Technol.* 1(2): 55–56.

2321. **Singh, S.P. & Thadani, R. 2011.** *Biodiversity Conservation in Western Himalaya - Western Himalayan Ecoregional Strategy and Action Plan.* DLRC, CEDAR and Bishen Singh Mahendra Pal Singh, Dehradun.

93. **Sinha, B.K. & Verma, B.K. 1988a.** "Distributional notes of some rare and interesting plants from Banda district (U.P.)". *Proc. Natl. Acad. Sci. India* 58B (4): 577–579.

2322. **Srivastava, A., Srivastava, S.K. & Dangwal, L.R. 2016b.** "Specific habitat requirement and *ex-situ* conservation of some threatened plant species of Western Himalaya". *NeBIO* 7(4): 179–184.

Abstract: The paper deals with the conservation strategies applied for the *ex-situ* conservation of the some threatened plants of Indian Western Himalaya in the botanical garden of Botanical Survey of India, Dehradun. The specific habitat requirements, propagation methods along with study on growth and survival percentage in *ex-situ* condition of the selected species are also discussed.

2323. **Srivastava, S.K. 2002.** "Threatened taxa of *Jasminum* L. in India". *Phytotaxonomy* 2: 94–99.

Abstract: *Jasminum* L. is represented in India by 49 species mainly distributed in Himalayas, Deccan Peninsula and Andaman & Nicobar Islands. 16 species are endemic to India. Of these, eight are rare and considered to be endangered, as they have not been recorded, after their type collections. This paper gives taxonomic details of eight threatened species, emphasing their conservation status, type localities and future strategies for undertaking conservation measures.

2324. **Srivastava, S.K. 2011.** "Plant diversity and conservation strategies of Uttar Pradesh". *Phytotaxonomy* 11: 45–62.

Abstract: India became a signatory to the Convention on Biological Diversity in June 1992 and ratified the same in February 1994. Efforts were made to fulfil the requirement under Article 6 of the Convention and carry out documentation of base line data on different aspects of the components made on the status of plant diversity in the state of Uttar Pradesh. The present paper comprises an overview of the assessment of the flora of state, literature review, vegetation type, wetlands, ethnobotanical studies, floristic analysis, endemism, invasive alien species and the areas with rich plant diversity, including protected areas and sacred groves.

2325. **Sumit, M. & Dhar, U. 2002.** "Conservation and utilization of *Arnebia benthamii* (Wall. ex G. Don) Johnston– A high value Himalayan Medicinal plant". *Curr. Sci.* 83(4): 484–488.

Abstract: The investigation on conservation and utilization of *Arnebia benthamii* (Wall. ex G. Don) Johnston was carried out to identify optimum stage of the collection of propagules, improve upon the rooting of root cuttings and identification of optimum conditions for seedling survival. Individuals at reproductive maturity were found suitable for collection of propagules because of the occurrence of 3-5 buds at the terminal growing end of the root. These buds can be effectively utilized for vegetative propagation. Chilling for 40 days significantly ($P < 0.05$) improved rooting of root cuttings. Seedling survival and growth performance were significantly ($P < 0.05$) higher at a high-altitude village Lata, thereby facilitating the establishment of herbal gardens in the vicinity of natural population. This activity will not only reduce pressure on the natural population, but also has the potential to generate rural economy. Further, the possibilities of revegetating the degraded natural habitats and creating nursery centres at low-altitude areas are discussed. This study will help in developing conservation strategy for optimum utilization of *A. benthamii*.

2326. **Tamta, B.P., Kumar, V. & Ahamed, N. 2019.** "*In-situ* conservation of selected medicinal plants species in Alpine zone Kandara Medicinal Plants Conservation Area in Uttarkashi, Uttarakhand". *J. Non-Timber Forest Prod.* 26(4): 185–190.

Abstract: Among the 40 medicinal plant species of alpine zone for which Kandara MPCA has been declared for *in-situ* conservation only three globally significant medicinal plants viz., *Aconitum heterophyllum* (Endangered as per IUCN Red List), *Picrorrhiza kurrooa* (Endangered) and *Nardostachys jatamansi* (Critically Endangered as per IUCN Red List) have been selected for *in-situ* conservation. The enrichment was standardized through planting seedlings, rhizomes and seeds from the natural populations in the MPCA at lower, middle and upper $1/3^{rd}$ portions of the hill slopes in compartment 3b of Kandara MPCA. The upper $1/3^{rd}$ portion of the hill slopes showed highest survival (52% seedlings and 42% from seeds) for *Aconitum heterophyllum* and 60% for seedlings, 42% for rhizomes/stolons and 33% for seeds of *Picrorrhiza kurrooa* respectively in comparison to middle and low $1/3^{rd}$ portion of the hill slope. Seedlings performed better as compared to rhizomes and seeds in terms of survival percent. Therefore, enrichment planting through nursery raised seedlings can be an effective method for *in-situ* conservation of these medicinal plant species in their natural habitat.

2327. **Tewari, K.C., Tewari, R.N., Joshi, G.C. & Pandey, G. 1992.** *Saving Endangered Medicinal Plant Resources of Hills, Uttarakhand*. Uttarakhand Sdodh Sansthan, Pantnagar.

2328. **Tiwari, V., Negi, K.S., Rawat, R., Mehta, P.S. & Chandra S. 2016.** "Role of home garden for *in-situ* conservation of agro-biodiversity: a case study of Dhari block, district Nainital, Kumaun region of Uttarakhand". *J. Non-Timber Forest Prod.* 23(3): 169–180.

Abstract: Since time immemorial, the natives were growing and maintaining plant diversity in the vicinity of dwelling places which is popularly known as Home Garden. The present study was conducted to assess role of home garden for *in-situ* conservation of plant diversity in Dhari block, district Nainital, Uttarakhand with the major aim of understanding the plant diversity available especially with respect to the home gardens and role of vice-versa in their day to day life. With the help of questionnaire and survey, the information was collected from six villages i.e., Chaukuta, Dhanachuli, Gajar, Kasiyalekh, Podiyal and Pokhrar. Information regarding the occurrence of plant species, their local names, parts used and formulation through interviews and

discussions held with elderly persons of rural communities were recorded. The study documented 93 plant species belonging to 79 genera and 51 families ranging from forestry to horticulture and agriculture including ethno-medicinal plants as grown in the home gardens and these plant species were used for multiple purposes i.e., cereals, fire woods, fodders, fruits, leafy vegetables, ornamentals, pseudo-cereals, spices, vegetables and other cultural significance. These observations indicated that home garden play an important role in food security and *in-situ* conservation of agri-horticultural plants.

2329. **Uttarakhand Biodiversity Board. 2013.** *Threatened Species of Uttarakhand.* Uttarakhand Biodiversity Board, Dehradun.

2330. **Ved, D.K., Kinhal, G.A., Rajkumar, K., Prabhakaran, V., Ghate, U., Vijayashankar, R. & Indresha, J.H. 2003.** Conservation Assessment and Management Prioritization for Medicinal Plants of Jammu & Kashmir, Himachal Pradesh and Uttaranchal. Regional Workshop, Shimla Report. FRLHT, Bangalore.

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2331. **Adhikari, B.S., Babu, M.M., Saklani, P.L. & Rawat, G.S. 2003.** "Medicinal trees of Uttaranchal state: Distribution, use pattern and prospects for conservation". *Indian Forester* 129(2): 243–267.

Abstract: This paper deals with distribution and use pattern of medicinal trees in the State of Uttaranchal, India. Based on extensive literature survey, a list of 197 medicinal trees found in Uttaranchal has been appended. Their altitudinal distribution and parts used in various ailments have been given. Euphorbiaceae, Fabaceae, Moraceae and Rosaceae are the largest families having more than 10 species of medicinal trees. The medicinal trees in different ecological regions found in sub-tropical, warm temperate, cool-temperate, sub-alpine and alpine are 170, 64, 22, 10 and 4, respectively. The major parts used in various ailments are bark (118 species), leaves (78 species), fruits (65 species), root (42 species) and seed (30 species). The diseases such as dysentery, fever, diarrhoea, rheumatism, wounds, cholera, skin diseases, bronchitis, cough and asthma are the most frequent ailments. The prospects of *in-situ* and *ex-situ* conservation of medicinal trees in Uttaranchal State have been discussed.

2332. **Adhikari, B.S., Babu, M.M., Saklani, P.L. & Rawat, G.S. 2005.** "Distribution, use pattern and potential for conservation of medicinal climbers in Uttaranchal state". *Indian Forester* 131(7): 901–916.

Abstract: This paper provides information on the distribution and use pattern of medicinal climbers in Uttaranchal State, India. A list of 88 medicinal climbers, found in Uttaranchal has been appended based on extensive literature survey. Their altitudinal distribution and parts used in various ailments has been analyzed. Fabaceae, Vitaceae and Cucurbitaceae are the largest families, and have more than 10 species of medicinal climbers.

2332. **Adhikari, B.S., Babu, M.M., Saklani, P.L. & Rawat, G.S. 2007.** "Distribution, use pattern and prospects for conservation of medicinal shrubs in Uttaranchal state, India". *J. Mountain Sci.* 4(2): 155–180.

Abstract: The present paper gives an insight into the distribution and use pattern of medicinal shrubs in Uttaranchal State. A total of 222 medicinal and aromatic shrub species have been appended based on secondary information. Euphorbiaceae, Rosaceae, Verbenaceae, and Fabaceae have the highest representatives of medicinal shrubs. Twenty one families had one species each in medicinal use. Verbenaceae and Euphorbiaceae in the sub-tropical region, Rosaceae in the temperate region, and Ericaceae and Rosaceae in the sub-alpine and alpine regions, respectively, had the highest representatives of medicinal shrubs. The distribution of medicinal shrubs was 42% in sub-tropical, 29% in warm temperate, 13% in cool temperate, 9% in sub-alpine and 7% in the alpine region. Of the total species, 70 medicinal shrubs were native to the Himalayas and 22 native to Himalayan region including other Himalayan countries. The most frequently used plant parts for various ailments were leaves (31%) and roots (23%). Most shrubs are being used for the diseases, viz. skin diseases, dysentery, cough, fever, wounds, and rheumatism. The present paper will help in the execution of strategies for promotion and cultivation of medicinal shrubs in Uttaranchal State.

2333. **Adhikari, B.S., Babu, M.M., Saklani, P.L. & Rawat, G.S. 2010.** "Medicinal plants diversity and their conservation status in Wildlife Institute of India (WII) Campus, Dehra Dun". *Ethnobot. Leafl.* 14: 46–83.

Abstract: The present paper deals with the status and distribution pattern of medicinal plants in Wildlife Institute of India campus, Dehradun, Uttarakhand, India. Based on extensive literature survey, of the total (605 plants) 63% are medicinal plants. These medicinal plants comprise of 63 trees, 55 shrubs, 208 herbs, 34 climbers, 3 ferns and 10 grasses belong to 94 families. Poaceae, Asteraceae, Cyperaceae and Euphorbiaceae are the largest families and have more than 20 species of medicinal plants. Fabaceae, Asteraceae, Poaceae, Euphorbiaceae, Lamiaceae, Malvaceae, Acanthaceae, Apocynaceae, Caesalpiniaceae, Verbenaceae, Cucurbitaceae and Solanaceae are the dominant families with high species diversity. The nativity of plants shows that 21 species are from Himalayan region and 101 from Indian oriental region, while remaining are from various parts of the world. *Pyrus pashia* and *Rubia cordifolia* have the distribution up to cool temperate region among trees and climbers, respectively. Among plant parts, bark, leaves and roots are mainly used for trees, shrubs and climbers, respectively. However, the entire plant of herbs, grasses and sedges and leaves and roots of ferns are used. Most of the species of trees, herbs and climbers are used for diarrhoea/dysentery, shrubs for cough/cold, grasses and sedges for fever and ferns for skin diseases. The conservation efforts have been discussed in the paper.

2334. **Agarwal, R. 2019.** "Ethnobotanical studies of medicinal plants in chopta-mandal forest of Garhwal Himalayas in Uttarakhand". *J. Pharmacogn. & Photochem.* 8(2): 774–776.

Abstract: Uttarakhand, in the Indian Himalaya, has a rich diversity of medicinal plants, which are widely used. Medicinal plants have played an important role of primary health care system among the local people of Himalayan region. However, information on the uses for plants for medicine is lacking from many interior areas of Himalaya. The study aimed to look into the diversity of plant resources that are used by local people for curing various ailments. Questionnaire surveys, participatory observations and field visits were planned to illicit information on the uses of various plants. The study came to document nearly 64 species of plants used as wild edibles. Analysis of taxonomic group of plants revealed that a total of 31 wild edible species used for medicinal purposes belongs to 27 genera and 23 families. Mostly leaves, roots, seeds, fruit, bark and whole plant are used to prepare medicine. Collection of wild medicinal plants is not the usual practice of all the villagers, only few knowledgeable people (Vaids), old people and others) who are able to identify collect them from the wild and store them for future use.

2335. **Agnihotri, P., Hussain, T. & Singh, H. 2009.** "Nakuleshwar– A newly discovered sacred groves from Pithoragarh district". *Sci. & Cult.* 75: 42–47.

2336. **Agnihotri, P., Singh, H. & Hussain, T. 2012.** "Patalbhuvneshwar: A new sacred groves from Kumaon Himalaya". *Curr. Sci.* 102: 830–831.

2337. **Agnihotri, P., Semwal, M., Singh, H. & Husain, T. 2013.** "A glimpse of vegetation and threatened medicinal plant diversity of Govind Wildlife Sanctuary, Garhwal Himalaya". *J. Biodiv. Manage. & Forest.* 2: 4. doi:http://dx.doi.org/10.4172/2327-4417.1000116.

Abstract: Surveys were conducted in different seasons during 2012-2013 in Govind Wild Life Sanctuary (GWLS) and on the basis of different altitudinal gradients and physiognomy, different forest types and habitats were identified. During the study it was revealed that the number of altitudinal gradients and topography enrich the area with suitable habitat for diversified plant wealth. Till now, 178 species belonging to 110 genera and 65 families of Angiosperms have been collected, but species diversity in dense forest cover is very high, which is additionally supported with contiguous forest and ca. 1500-2000 plant taxa of higher plants are estimated to be present in Govind Wild Life Sanctuary (GWLS), situated in Uttarkashi district of Uttarakhand, India, supports enormous plant diversity including several threatened plants of high medicinal value. Despite of legal protection this protected area is facing severe threat due to anthropogenic pressure, which in turn produces adverse natural pressure. The forest and vegetation types including some highly medicinal plants and their habitats in GWLS have been highlighted in the present study.

2338. **Agnihotri, P., Sharma, S., Dixit, V., Singh, H. & Hussain, T. 2012.** "Conserved patches of ethnic flora in Kumaon Himalaya". *Indian Forester* 138(4): 371–375.

Abstract: Ethnobotanical investigation carried out in 6 sacred groves of Pithoragarh district in Kumaun Himalaya, during 2009-2010 revealed therapeutic application of 32 plant species representing 31 genera and 20 families. 18 species of herbs are used by the local people to cure various ailments (56.25%) followed by shrubs with 8 species (25%), climbers 3 species (9.37%) and trees 3 species (9.37%). Family

Asteraceae is dominant over the others with 6 species followed by Rosaceae with 3 species, Amaranthaceae, Malvaceae, Cleomaceae, Menispermaceae with 2 species while many other families contributes one species.

2339. **Agrawal, R.G., Pant, P., Tewari, L.C., Singh, J., Pandey, M.J. & Tiwary, D.N. 1989.** "Preliminary phytochemical screening of medicinal plants of hilly districts (Kumaon and Garhwal Divisions) of U.P. (Pt. II)". *Bull. Med.-Ethno-Bot. Res.* 10(3-4): 176–186.

Abstract: Present paper deals with phytochemical screening of fifty-one medicinal plants collected from hilly districts of Uttar Pradesh (Kumaun and Garhwal Divisions) which are used in indigenous system of medicine as well as by the local inhabitants either as single drug or in combinations, for the cure of various ailments. The study carried out so far, revealed the presence of alkaloids in thirty one plants, flavonoids in twenty eight, glycosides in thirty four, saponins in thirty four, sterols in thirty seven and terpenoids in thirty three plants.

2340. **Ahamed, N. & Gupta, A.K. 2010.** "Ethnomedicinal plant remedies for snake bite among rural peoples of Baghpat district, Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 34(3): 714–717.

Abstract: Ethnomedicinal investigations for snake bite were carried out 2002-2005 in Baghpat district, Uttar Pradesh. As many as 31 species of genus 30 belong to 20 families were found useful in snake bites were recorded. Maximum number of medicinal plant species were belongs to family Apocynaceae, Verbenaceae, Lamiaceae and Euphorbiaceae. The study found strong correlation for the people of Baghpat as antidote to snake bite purpose.

2341. **Ahamed, A. & Gupta, A.K. 2011.** "Ethnobotany of agroforestry species of Bagpat district (Uttar Pradesh) India". *J. Non-Timber Forest Prod.* 18(3): 253–256.

Abstract: The study conducted during 2003-2005 in rural areas of Baghpat district provides first hand information on ethnobotany of Agroforestry species commonly used for various purposes. A total of 46 species belonging to 39 genera and 25 families were reported from the study area. Maximum number of plant species belongs to family Moraceae (7). Mimosaecac (3) and Caesalpiniaceae (3). The 17 families are represented by single genus and single species.

2342. **Ahamed, N., Gupta, A.K. & Neetu. 2010.** "Ethnomedicinal plants of Deoband tehsil of Saharanpur district, Uttar Pradesh, India". *Indian Forester* 136(11): 1520–1528.

Abstract: The present paper describes ethnomedicinal plant of Deoband tehsil of Saharanpur district, Uttar Pradesh. An ethnobotanical survey was conducted in villages of study area, during 2005-2006. 74 plant species under 69 genera belonging to 42 families were found to ethnomedicinal value. The plant species are enumerated in alphabetical order with families and local names, followed by their ethnomedicinal uses.

2343. **Ahamed, N., Kumar, Sanjay & Gupta, A.K. 2011.** "Indigenous uses of wetland plants of Deoband tehsil (district Saharanpur), Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 35(4): 696–699.

Abstract: The present paper deals with indigenous uses of wetland plants of Deoband tehsil of Saharanpur district, Uttar Pradesh. An ethnobotanical survey was conducted

in villages of study area, during 2005-2006, and 32 plant species under 30 genera belonging to 22 families have been enumerated. The plant species are enumerated in alphabetical order with local names, families, flowering & fruiting period, followed by their uses. Among the described useful species, the families Asteraceae, Polygonaceae and Amaranthaceae are most frequently represented with 3 species each, followed by Hydrocharitaceae, Lamiaceae and Poaceae with 2 species each.

2344. **Ahamed, N., Neetu & Gupta, A.K. 2010.** "Ethnomedicinal survey of district Haridwar, Uttarakhand with reference to climber palnts". *J. Non-Timber Forest Prod.* 17(2): 223–226.

Abstract: The present paper describes ethnomedicinal climber plants of Haridwar district, Uttarakhand. An ethnomedicinal survey was conducted in study area during 2005 and 30 species of medicinally important climbers under 24 genera and belonging to 13 families were found.

2345. **Ahamed, N., Neetu & Gupta, A.K. 2012.** "Medicinally important weeds of district Bagpat, Uttar Pradesh, India". *J. Non-Timber Forest Prod.* 19(3): 213–218.

Abstract: The present paper describes medicinally important weeds plant of district Baghpat, Uttar Pradesh. An ethnoobotanical survey was conducted in villages of study area, during 2003-2005, and 53 plant species under 48 genera belonging to 28 families were found of ethonomedicinal value. The plant species are enumerated in alphabetical order with families and local names, followed by their ethonomedicinal uses.

2346. **Ahluwalia, K.S. 1965.** "Medicinal plants of Har-ki-Dun, Tons Division, UP". *Nagarjun* 8: 135–139.

2347. **Ahmad, A. 1995.** "Drugs of plant origin as used by certain tribes of eastern UP (Part IV)". *Int. J. Mendel* 12(1-4): 12–14.

2348. **Ahmad, A. 1996.** "Drugs of plant origin as used by certain tribes of eastern (Purvanchal) UP Part V". *Indian J. Appl. & Pure Biol.* 11(1): 41–52.

2349. **Akhtara, R., Negi, J.S. & Naithani, R. 2012.** "Determination of dyeing property of some medicinally important plant species of Uttarakhand Himalayas". *Indian J. Tradit. Knowl.* 11(3): 528–531.

Abstract: In ancient India people used natural dyes to stain woollen products. These dyes were obtained from roots, leaves and bark. Although the plant species give certain dye due to the presence of colourant in it but the colour could be varied by adding various mordants. In the present study, *Myrica esculenta* Buch.-Ham., *Pinus roxburghii* Sarg. and *Terminalia chebula* Retz. have selected as natural dyes on the basis of their traditional uses. The pH and ODs of dyeing solutions was measured before and after dyeing. Colour fastness was also determined. It has been found that the ODs decreased after dyeing.

2350. **Alam, M.M. & Anis, M. 1987.** "Ethnomedicinal uses of plants growing in Bulanshahr district of northern India". *J. Ethnophamacol.* 19(1): 85–88.

Abstract: A medico-botanical study was carried out in certain villages of the Bulandshahr district in Uttar Pradesh, India, on the traditional uses of medicinal plants by the rural population for curing human diseases. Certain plants were considered useful in only one disease whereas a new had multiple uses. Recipes with a suitable dose, precautions, if any, and mode of administering the drugs are suggested.

2351. **Ali, Z.A. & Singh, K. 2002.** Plants used for the treatment of skin diseases in the sub-Himalayan Terai region of Uttar Pradesh, India. In: Singh, V.K., Govil, J.N. & Singh, G. (eds.), *Recent Progress in Medicinal Plants: Ethnomedicine and Pharmacognosy*. SCI Tech Publishing LLC, Houston, Texas, USA. Pp. 55–62.

2352. **Anand, R.K., Singh, M.P., Dwivedi, S.V., Ram, S. & Khare, N. 2013.** "Ethnobotanical study of trees found in district Sonbhadra, Uttar Pradesh". *Technofame* 2(1): 1–5.

Abstract: Under the present study an ethnobotanical survey was conducted to document the ethnomedicinal uses of trees found in the district Sonbhadra, Uttar Pradesh. The information was gathered from tribals, local people, medicine man (Vaidya) using an integrated approach of personal contacts, interactions, interviews with questionnaire, group discussion, field visits, botanical collection and our own observations during 2010-2012. Total 30 trees found near the villages and in the forest are documented for the therapeutic uses. The documented ethnomedicinal uses of plants mostly pertains to cure diarrhea, dysentery, diabetes, fever, cough, jaundice, poisonous bite, toothache, gastric troubles, skin diseases and women related problems. After the analysis of the table of documented trees, it was observed that most of the medicinal trees were from family Fabaceae. In addition to this it was also observed that people preferred those trees for therapeutic uses, which were found near their houses and agricultural field.

2353. **Anis, M. & Iqbal, M. 1994.** "Medicinal plantlore of Aligarh, India". *Int. J. Pharmacogn.* 32(11): 59–64.

2354. **Ansari, A.A. 1991.** "Ethnobotanical notes on some plants of Khirsu, Pauri Garhwal, U.P.". *Ethnobotany* 3: 105–106.

Abstract: The paper presents ethnobotanical notes on 16 species of flowering plants belonging to 15 families, which grow wild in Khirsu, Pauri Garhwal. The information is based on personal enquiries from the local inhabitants.

2355. **Ansari, A.A. 1992.** "Ethnobotany of *Urtica ardens* Link (Urticaceae)". *J. Econ. Taxon. Bot.* 16(2): 391–392.

Abstract: Cultural aspects including religious beliefs of *Urtica ardens* Link, a widely and commonly distributed herb as practiced in U.P. Himalaya are discussed.

2356. **Ansari, A.A. 1997.** "Medicinal plants of Madhulia forest of Gorakhpur". *J. Non-Timber Forest Prod.* 4(3/4): 138–150.

Abstract: The present paper deals with 158 species of flowering plants of medicinal value found wild in Madhulia forest of Gorakhpur Forest Division, Uttar Pradesh.

2357. **Ansari, A.A. 1998.** "Wild edible plants of Madhaulia forest, Gorakhpur, U.P.". *J. Econ. Tax. Bot.* 22(2): 367–370.

Abstract: The present paper deals with the 68 wild edible plants belonging to 39 families of flowering plants of Madhulia forest of Gorakhpur Forest Division. These plants are used by the villagers and local inhabitants of the area as vegetables and for other purposes. The uses varies from place to place and also the different parts of plants are used for different purposes with various methods, so in the present

report only those uses and methods as observed in the area have been given with particular reference to the local names, parts used and the exact mode of uses etc. The taxa are arranged alphabetically. For collector's name please read *Ansari.*

2358. **Ansari, A.A. & Nand, Ghana. 1985.** "Some important medicinal plants of Pauri Garhwal". *Himal. Chem. & Pharmaceut. Bull.* 2: 42–44.

2359. **Ansari, A.A., Tiwari, A.P. & Joshi, B. 2013.** "Ethnomedicinal plants of Ranipur Wildlife Sanctuary, Chitrakoot, Uttar Pradesh". *J. Non-Timber Forest Prod.* 20(3): 221–226.

Abstract: The paper provides information about ethnomedicinal uses of 36 angiospermic plant species belonging to 36 genera and 29 families used by the tribal communities of Ranipur Wildlife Sanctuary, Uttar Pradesh. These plants are mostly used to cure seminal weakness, fever, antidote, skin diseases, liver and stomach disorders, etc. Parts of the plant used, dosage, and mode of drug administration in different ailments are described. The species have been arranged alphabetically with correct botanical name with authority, family to which it belongs, local name, habit and ethnomedicinal uses.

2360. **Anthwal, A., Sharma, R.C. & Sharma, A. 2006.** "Sacred Groves: Traditional way of conserving plant diversity in Garhwal Himalaya, Uttaranchal". *J. American Sci.* 2(2): 35–38.

2361. **Arya, D. 2013a.** "Major wild edible fruits used by locals of Garhwal Himalaya". *Int. J. Advanced Life Sci.* 6(3): 145–149.

Abstract: The present investigation deals with the comparative study of major wild edible fruits used in oak and pine zones of Garhwal Himalaya. A total 15 major plant species belonging to 9 different families were reported in the present investigation, which have been used as major seasonal wild edible fruits since long time. Among these species *Myrica esculenta* (rank-1) was highly used in both zones as popular wild edible fruit having high nutritional value and good advantage for health. *Rubus laciocarpus* (rank II) and *Rubus ellipticus* (rank-III) were also highly preferred after *Myrica esculenta* as wild edible fruits in both zones on the basis of species listing and ranking. All three top ranked species were more significant in the point view of their nutritional and antioxidant properties. The main propose of this study was documentation of indigenous knowledge of locals about some wild edible fruits with their preference-wise uses, advantage for health (nutritional and antioxidant properties) on the basis of species ranking. The study was necessary as it help the community towards the conservation of these wild edible fruits plants and also generate the sustainable livelihood options for them in the future.

2362. **Arya, D. 2013b.** "Use of major plant species converting into conventional best bio-fertilizers (manure) in Garhwal Himalaya". *Int. J. Advanced Res. Engineering & Appl. Sci.* 2(3): 72–76.

Abstract: The present investigation deals with the comparative study of leaf litter of major plant species used to prepare bio-fertilizers by locals inhabiting in oak and pine zones of Garhwal Himalaya. A total 18 major plant species belonging to 14 different families were reported in present investigation, which has been used as leaf litter for the preparation of bio-fertilizers (manure). Among these species leaf litter of *Quercus leucotrichophra, Rhododendron arboreum* and *Lyonia ovalifolia* were highly used (as rank I–III) for the preparation of manure due to their availability through the year, while leaf litters of *Alnus nepalensis, Betula alnoides, Carpinus viminiea, Acer pictum, Juglance regia* and *Aesculus indica* were mostly preferred for best manure, but leaf litters of these species were not available through the year, because of its deciduous and early decomposing nature in oak zone while leaf litter of *Pinus roxburghii* was highly used in pine zone. The purpose of this study was documentation of those plants, which were frequently used in preparation of conventional bio-fertilizer on the basis of local's preferences. This study was necessary as it helps for the locals towards the enhancement of the organic farming and reduce the use of chemical fertilizers in point view of environmental conservation and health care.

2364. **Arya, D. 2014a.** "Plant species used as traditional agricultural implements and tools in Garhwal region of western Himalaya". *Indian J. Scientific Res. & Technol.* 2(1): 69–72.

Abstract: The present investigation deals with the local plant species used in making of traditional agricultural implements; handles of harvesting tool and their parts in Garhwal Himalaya. A total of 21 major plant species belonging to 14 families were used in making of traditional agricultural implements; handles of harvesting tools and their parts. Among these species *Quercus leucotrichophora, Q. semecarpifolia* and *Q. floribunda* were commonly used in making of agricultural implements; handles of harvesting tools and their parts due to their wood durability and quality (as rank I-III). *Pyrus pashia, Juglans regia* and *Prunus cerasoides* were also commonly used in making of harvesting tools and their parts in these areas (Table 1 & 2). The main purpose of this study was to document the traditional knowledge and art of locals (blacksmiths and carpenters) about the making of agricultural implements and tools, which have been prepared from the indigenous plants species science long time.

2365. **Arya, D. 2014b.** "Dwarf bamboo (ringal): a traditional livelihood option for scheduled caste families of Garhwal Himalaya". *Int. J. Advanced Res. Engineering & Appl. Sci.* 3(7): 67–73.

Abstract: The present investigation deals with Ringal a dwarf bamboo species, used for preparing as traditional handicraft articles and utility items in marginalized hill area villages of Dewal block in Garhwal Himalaya. 4 species of ringal were commonly used on the basis of their characteristic. Among these ringal species C*himnobambusa jaunsarensis* was mostly (40%) used by the ringal weavers (locally known as Rudiya) for making ringal based crafts and utility items followed by *Thamnocalamus falconeri* (30%) due to their smoothness, flexible and durable nature. Average 47.65% scheduled caste families were engaged as part time ringal weaving work out of total habitant schedule cast families of these study villages. The average income was between rupees 1398-1775/family/month, which plays an important role in sustaining their livelihood as well as supporting their socio-economic status. The main purpose of this study was to document the traditional knowledge and art of these schedule caste families, the Rudiya's or ringal weavers in the perspective of their ringal based crafts and articles and how much this art of theirs contributes to support and strengthen

their socio-economic status from time immemorial. Another purpose of this study was to conserve their traditional art, this knowledge was depleting in their young generations, due to migration, decreased farming and farmland, low income from the sale of these articles and the less of the interest.

2366. **Arya, D. & Khan, A.H. 2015.** "Ethnomedicinal plants and their contribution to cure various ailments as household remedies in Garhwal Himalaya, India". *Int. J. Pharmaceut. Sci. & Res.* 6(4): 1590–1595.

Abstract: The present investigation was carried out in five villages of the marginalized hill area block of Dewal in Chamoli district, regarding the uses of mild and native ethno-medicinal plants, by locals in their traditional health care system. The people residing in this area have been in isolation for centuries and possess good knowledge of phytotherapy. A total of 51 species of medicinal plants (both wild and cultivated) belonging to 30 families and 45 genera are being used in their folk system of treatment (locally known as 'Gharelu Upchar'). These plants are used in crude form to treat various ailments like, cough and cold, stomach problems, skin diseases, dysentery, boils and pimples, anaemia asthma, cuts and wounds, various fevers, bone fractures, kidney/ gall stone problems and other such indispositions. The main purpose of this study was to document the indigenous knowledge of Vaidyas and other knowledgeable persons of the area about the use of local flora, as household remedies for treating different ailments.

2367. **Arya, D., Bohra, C.P.S. & Tewari, A. 2011.** "Use of major fodder species in Oak and Pine dominant zones of Garhwal Himalaya, India– A case study". *E-Int. Scientific Res. J.* 3(3): 187–191.

Abstract: The present investigation deals with the comparative study of major fodder species used in pine and oak zones of Garhwal Himalaya in oak dominated zone, *Quercus floribunda, Q. semecarpifolia, Grewia oppositifolia, Ficus* spp., *Themeda arundinacea* and *Brachiaria villosa* were widely used fodder species; while in pine dominated zone, *Grewia oppositifolia, Ficus* spp., *Themeda arundinacea* and *Brachiaria villosa* were widely used as fodder. *Grewia oppositifolia, Ficus* spp. and *Themeda arundinacea* are the most preferred plants used as fodder by the natives of these places, because of their high nutrient value and milk production capacity.

2368. **Arya, D., Joshi, G.C. & Tewari, L.M. 2012.** "Status and trade of crude drug in Uttarakhand". *J. Med. Pl. Res.* 6(18): 3434–3444.

Abstract: The present study deals on crude drug marketing in Tanakpur market, a virgin mandi of Uttarakhand. Survey of Tanakpur mandi was carried out in 2005 and 2008. A complete data of crude drugs in trade was gathered, 65 crude drug samples were collected from different traders of Tanakpur for authentication on taxonomical basis. After critical evaluation, it was found that some of the crude drugs were substituted/adulterated and some crude drugs were imported through Indo-Nepal Borders.

2369. **Arya, D., Khan, A.H. & Adhikari, M. 2014.** "Plant species used by locals as ethno-medicine in Kumaun region of Western Himalaya (India)". *Int. J. Pharmaceut. Sci. & Res.* 5(8): 3128–3132.

Abstract: The present investigation carried out in six villages of Almora district of Kumaun Himalaya regarding mild and native ethnomedicinal plants which were used by locals in their own traditional health care system. This study reveals the status of ethno-medicinal plants and their importance preserved by locals of Kumaun region. During the study it was observed that 47 species of medicinal plants belonging to 38 genera and 28 families were being used in ethno medicine by locals with advice of Vaidhyas and experienced persons of the region since long time. The main purpose of this study was to document the indigenous knowledge of Vaidhyas and other experienced persons of the area regarding the use of ethno-medicinal plants, their conservation and imparting this knowledge with younger generation. Because, the indigenous knowledge of local flora are being eroded in younger generation, therefore the present study may help in fulfill this gap respectively.

2370. **Arya, D., Goel, S., Shinde, P., Joshi, G.C., Sharma, O.R. & Sharma, S.K. 2017.** "*Dysoxylum binacteriferum* Hook. f.: A promising herbal drug used in folk medicine by tharu community of Uttarakhand". *World J. Pharmaceut. Res.* 6: 296–301.

Abstract: Due to the extreme inhospitable conditions, tribal communities are dependent on collection and trade of medicinal plants, and they have gradually become familiar with the healing properties of the available plants. The Tharu tribe is a most popular tribe of India and Nepal. A smaller number of Tharu live in India, mostly in in Udham Singh Nagar District of Uttarakhand. The Tharu is largest and oldest ethnic group of the Terai region. *Dysoxylum binectariferum* Hook. f. Locally known as Achalkaat, is a small or medium sized tree up to 5 feet girth and 50 feet high from the family Meliaceae. *Dysoxylum* is used in treatment of Osteomylitis and Abscess many skin ailments and also in cancer among Tharu community of Uttarakhand. The alkaloids present in this plant have also shown anti-inflammatory, analgesic, antibacterial and anti-cancer properties. Hence *Dysoxylum* is a promising drug which can be incorporated in extensive preclinical and clinical research for its healing, analgesic anticancerous properties.

2371. **Arya, K.R. 2001.** "Recent observations on medicinal plant biodiversity and conservation of some hot spot areas of Kumaon Himalaya". *J. Med. Aromat. Pl. Sci.* 23: 77–81.

2372. **Arya, K.R. 2002.** "Traditional uses of some common plants in indigenous folklore of Doonagiri: A myth hill of Uttarakhand". *Indian J. Tradit. Knowl.* 1(1): 81–87.

Abstract: This communication deals with the traditional uses of 19 common plants used by the local inhabitants and Vaidyas of Dronagiri, a mythic hill of Almora district in Uttaranchal in their indigenous folklore. For each plant specimen described, botanical name, local name(s), parts, preparation, mode and use(s) are given.

2373. **Arya, K.R. 2008.** "*Ulmus wallichiana:* An ethnobotanical plant for osteogenic drug from western Himalaya". *J. Med. Aromat. Pl. Sci.* 31: 62.

2374. **Arya, K.R. & Agarwal, S.C. 2008.** "Folk therapy for eczema, bone fracture, boils, sores and gingivitis in Taragtal province of Uttaranchal". *Indian J. Tradit. Knowl.* 7(3): 443–445.

Abstract: The communication provides the findings of the folk therapy used for the treatment of eczema, bone fracture, boils, sores and gingivitis of Taragtal province at Ganai block of Almora district in Uttaranchal. The study area is extremely remote part of the district and is inhabited by majority of Kumaoni and few of them are Garhwali. The general population and the traditional herbal healers continue to rely on their folk system of medication for their healthcare. A total number of 15 participants from general public, 14 traditional herbal healers, and 24 patients suffering from above diseases were involved in the study as a source of information. The aim of the study is to explore the folklore therapy of this region for the treatment of eczema, bone fracture, boils, sores and gingivitis for the betterment of the common people and wider application.

2375. **Arya, K.R. & Prakash, V. 1999.** "Ethnomedicinal study of a remote tribal areas of Almora district: A survey report– Part I". *J. Econ. Taxon. Bot.* 23(2): 247–252.

Abstract: Jhuni village one of the most remote and less accessed hilly tribal area of Almora district (recently carved under Bageshwar district) of Uttar Pradesh (towards China border) is inhabited by the mixed tribal population of Bhutias known as Bhima, Harkotya, Martolia and Khaljhunia. This paper contains a brief account on ethnomedicinal uses of 22 plant species occurring in Jhuni village and its adjoining areas. The plants collected during the survey are enumerated alphabetically with correct nomenclature, vernacular name, field number and approximate altitude.

2376. **Arya, K.R. & Prakash, V. 2003.** Ethnomedicinal study of a remote tribal area of Almora district: A survey report- Part– I. In: Maheshwari, J.K. (Ed.), *Ethnobotany and Medicinal Plants of Indian Subcontinent*. Scientific Publishers, Jodhpur, India. Pp. 247–252.

2377. **Arya, K.R., Pande, P.C. & Prakash, V. 1999.** "Ethnobotanical study on tribal areas of Almora district- II". *Ethnobotany* 11: 100–104.

Abstract: The first paper in this series dealth with ethnomedicinal uses of 22 plants recorded from the most remote and tribal population (Bhotiyas) of Jhuni and adjoining villages near Pindari glacier of Bagheshwar district in Uttar Pradesh. This communication deals with 14 more plants pertaining to some interesting ethnobotanical records available with the ribal group of the above areas.

2378. **Arya, K.R., Sharma, D. & Kumar, B. 2011.** "Validation and quality determination of an ethnobotanical lead for osteogenic activity isolated from *Ulmus wallichiana* Planch.: A traditional plant for healing fractured bones". *J. Scientific & Industrial Res.* 70: 360–364.

Abstract: *Ulmus wallichiana* is an important traditional and endangered plant species of Western Himalaya, used for treatment of fractured bones in animal as well as human beings. This paper presents significant ethnobotanical information of *U. wallichiana* collected from folk tradition of remote hilly localities of Almora and Bageshwar districts of Kumaon Himalayan, Uttarakhand, India. Folk claim is validated through chemical and pharmacological outputs followed by identification and qualitative determination of bioactive compounds.

2379. **Arya, K.R., Kumari, T., Sharma, C., Singh, A., Bajpai, V., Srivastava, M. & Kumar, B. 2014.** *Mahonia borealis* Takada– A less known ethnobotanical plant in Bageshwar district, Kumaun, Uttarakhand: its chemo profiling through Dart-MS and QT of LCMS". *J. Econ. Taxon. Bot.* 38(2): 361–368.

Abstract: *Mahonia borealis* Takeda (MB), a less known medicinal plant is traditionally used as medicine and natural dye in Kumaon Himalaya, Uttarakhand, India. This paper provides information on folk remedies used by local inhabitants of Bageshwar district, Kumaon, Uttarakhand, India. Chemical constituents of roots, stem, leaves and fruits (MB) were analysed using Direct Analysis in Real Time (DART) and Quadrupole-Time of Flight High Resolution Mass Spectrometer (QTOFHRMS) techniques and nine therapeutically important compounds Magnoflorine, Ketobarberine, Stigmasterol, Tocopherol, Berbamine, Pakistanamine, Berberine, Jatrrhorizene and Plamatine have been determined. Individual marker components peaks from root, stem, leaf and fruits were also identified through Principal Components Analysis (PCA).

2380. **Aswal, B.S. 1992.** "Less known medicinal uses of three plants from Kumaon Himalaya (India)". *Indian J. Forest.* 15(1): 76–77.

Abstract: In the present paper, the medicinal uses of *Inula cappa* (Ham. ex D. Don) DC., *Pogostemon benghalensis* (Burm.f.) O. Kuntze and *Woodfordia fruticosa* (L.) Kurz were gathered from the local inhabitants of Patwadanger village, Nainital district, U.P. Since this information is not recorded earlier, therefore, it is considered worthwhile to publish such information, which may be significant for the discovery of new or better drugs or new lead molecules from natural resources.

2381. **Aswal, B.S. 1996.** Conservation of ethnomedicinal plant diversity of Garhwal Himalaya in India. In: Jain, S.K. (Ed.), *Ethnobotany* in *Human Welfare*. Deep Publications, New Delhi. Pp. 133–135.

2382. **Aswal, B.S. 2001.** Biologically active medicinal plants of the Himalaya. In: Samant, S.S., Dhar, U. & Palm, L.M.S. (Eds.), *Himalayan Medicinal Plants: Potential and Prospects.* Gyanodaya Prakashan. Nainital. Pp 377–391.

2383. **Aswal, B.S. & Goel, A.K. 1989.** "Less-known medicinal uses of three plants from Western Himalaya (India)". *Econ. Bot.* 43: 419–420.

2384. **Atique, A., Iqbal, M. & Ghouse, A.K.M. 1985.** "Folk-medicinal uses of *Ficus benghalensis* Linn. and *Punica granatum* Linn. in northern Uttar Pradesh". *Bull. Med.-Ethno-Bot. Res.* 6(1): 42–46.

2385. **Awasthi, A., Rawat, G.S. & Rajvanshi, A. 1999.** "Assessment of human use and ethnobiological values in Tehri dam submersible area, Garhwal Himalaya". *J. Non-Timber Forest Prod.* 6(3–4): 199–206.

Abstract: A multi-purpose hydro-electric project which submerges a vast tract of land, displaces a mass population of approximately 30,000, promotes various socio-economic, and ecological changes is in progress near Tehri town, Garhwal Himalaya. A study was carried out during April-May 1996 to assess the human use patterns and ethnobiological values in the area. Although the vegetation of the submergence zone is largely secondary scrub, it serves as a resource base for various needs of the locals. Of the total submerging villages (91) in both Bhagirathi and Bhillangna valleys,

30% were randomly selected and assumed to be representative of the whole submersible zone. Structured questionnaires were used for village survey. Of the total population, 95% use both fire-wood and cooking gas as source of energy. Average consumption of fuel-wood (household/day) was estimated to be 9.8 kg which increases to 14.2 kg/h. hold/day during winter. Lantana camara, a widely distributed shrub was found to be major source of fuel-wood. Majority of fodder (68%) demand was fulfilled by the agricultural by-products and grasses and 32% by foliage fodder. Average fodder requirement per house hold was about 11 kg/day. Based on the land holding pattern villages were grouped into three classes, viz., class I, class II and class III. Similarity index between three classes of villages shows a more affinity between class I and class II villages (73.4%). Respondent data analysis gave an information on 66 plant species which are used by the inhabitants for one or the other purpose (fuel-wood, fodder, medicinal, religious and household items). The maximum number of species was used for medicinal purpose (44%) followed by fodder (18.2%), and least provided fibre values (1.5%).

2386. **Awasthi, A.K., Gupta, Anjana & Goel, A.K. 2008.** "*Alectra parasitica* var. *chitrakutensis*– A rare traditional remedy for leucoderma and virility in Chitrakoot region of Uttar Pradesh". *Ethnobotany* 20: 154–156.

Abstract: This communication is aimed to document the traditional medicinal uses of lants and to propose conservation strategies for endemic and threatened species occurring in Chitrakoot region of Uttar Pradesh. An endemic and rare plant species viz., *Alectra parasitica* var. *chitrakutensis* Rau has been locally used to treat leucoderma and virility by the indigenous people since the time immemorial and needs immediate attention for conservation.

2387. **Badoni, A.K. 1986.** "Some aspects of the ethnobotany of the hill tribes of Uttarkashi district". *Proc. Indian Botanical Conference* 65: 57–58.

2388. **Badoni, A.K. 1987-1988.** "Ethnobotany of hill tribes of Uttarkashi: Plants used in rituals and psychomedicinal practices'. *J. Himal. Stud. Reg. Develop.* 11-12: 103–115.

2389. **Badoni, A.K. 1990a.** "An ethnobotanical study of Pinswari community– A preliminary survey". *Bull. Bot. Surv. India* 32(1-4): 103–115.

Abstract: The egregious, idyllic, non-xenophobic Pinswari community is an isolated community dwelling in the remote hills of the Tehri district of Uttar Pradesh, India. They are the descendents of the Jaads (Huniyas) and are still isolated in the sense that normally does not have marital relation with the Garhwalis. Based on the ethnobotanical survey (1983-1988), 108 plant species which are used as medicines, fibre yielders, in arts and crafts, and in agricultural implements are reported. Correct botanical name, family, local name, collector's name (abbreviated as AKB) and number and detailed uses as given by local informants are given under each entry.

2390. **Badoni, A.K. 1990b.** "Remarks on the high altitudinal medicinal plants of Garhwal Himalaya". *J. Himal. Stud. Reg. Develop.* 13-14: 37–45.

2391. **Badoni, A.K. & Badoni, K. 2001.** Ethnobotanical Heritage. In: Kandari, O.P. & Gusain, O.P. (Eds.), *Garhwal Himalaya: Nature, Culture and Society.* Transmedia, Srinagar. Pp. 127–147.

2392. **Badruzzaman, Siddiqui, M., Alam, M.M. & Husain, W. 1989.** "Traditional treatment of skn diseases in Uttar Pradesh, India". *Econ. Bot.* 43(4): 480–486.

2393. **Bajpai, A., Ojha, J.K. & Sant, H.R. 1995.** "Medicobotany of the Varanasi district, Uttar radish, India". *Int. J. Pharmacogn.* 33(2): 172–176.

2394. **Bajpayee, K.K. 1997.** "Ethnobotany of *Phoenix* (Arecaceae)". *J. Econ. Taxon. Bot.* 21(1): 155–157.

Abstract: In the present investigation ethnobotanical uses of genus *Phoenix* (Arecaceae) have been recorded in reference to major tribal groups of uttar Pradesh, viz. Kols, Kanjars, Loharbadhyias, Nuts, Mallahas, Nutbhadiyas, Tharus and Ranas. *Phoenix sylvestris* Roxb. which is wild in nature has been found much useful than *Phoenix dactylifera* L. due to its cultivated form, for mentioned tribal communities.

2395. **Bajpayee, K.K. 2008.** "*Opomoea carnea* subsp. *fistulosa* (Convolvulaceae)– A friend plant of tribals". *J. Econ. Taxon. Bot.* 32(Suppl): 131–132.

Abstract: In the present investigation, ethnobotany of *Ipomoea carnea* Jacq. Subsp. *fistulosa* (Mart. ex Choisy) Austin (Convolvulaceae) has been discussed. The data were recorded in reference to tribal communities of Kanjars, Nuts, Lohar badhaiya, Tharus and Kalabaz etc. of Eastern Uttar Pradesh. The random survey and enquiries were made to draw the various uses of plant in welfare of tribals life.

2396. **Bajpayee, K.K. & Dixit, G. 1996.** "Ethnobotanical studies on food-stuffs of tribals of Tarai region, Uttar Pradesh". *J. Econ. Taxon. Bot.,* Addl. Ser. 12: 128–132.

Abstract: The paper contains ethnobotanical studies of food requirements of U.P.'s tribals such as Bheel, Kanjar, Banbasi, Kol, Nut, Kirat, Banjara, Lakhra and Tharu Rana of Tarai region. A survey of daily requirement of food of above tribals was made. A number of important plants or their parts used as food by these tribals have been listed.

2397. **Balkrishna, A., Srivastava, A., Mishra, R.K., Patel, S.P., Vashistha, R.K., Singh, A., Jadon, V. & Saxena, P. 2012.** "Astavarga plants– Threatened medicinal herbs of the North West Himalaya". *Int. J. Med. Aromat. Pl.* 2(4): 661–676.

Abstract: Astavarga eight medicinal plants viz., Kakoli (*Roscoea purpurea* Smith), Kshirkakoli (*Lilium polyphyllum* D. Don), Jeevak [*Crepidium acuminatum* (D. Don) Szlach], Rishbhak [*Malaxis muscifera* (Lindl.) Kuntze], Meda [*Polygonatum verticillatum* (Linn.) Allioni], Mahameda [*P. cirhifolium* (Wall.) Royle], Riddhi (*Habenaria intermedia* D. Don) and Vriddhi (*H. edgeworthii* Hook. f. ex Collett). All of these plants have their natural habitats in Himalaya particularly the North-West Himalaya in Jammu & Kashmir, Uttarakhand and Himachal Pradesh between elevations of 1500 and 4000 m asl. Their natural habitats are specific in ecological environment and hence these occur only in small pockets. Astavarga is important ingredient of various Ayurvedic formulations such as Chavyanprasha. Although some work has been done on identification of medicinal plants mentioned under Astavarga, but still there is need to identify the true representatives of this Astavarga group. The present communication deals with the taxonomical and medicinal properties of these eight medicinal plants.

2398. **Balkrishna, A., Sharma, S., Kumar, A., Srivastava, A., Shankar, R., Joshi, B. & Mishra, R.K. 2019.** "Study of medicinal weeds occurring around the Patanjali

Yogpeeth, Haridwar, Uttarakhand, India". *J. Non-Timber Forest Prod.* 26(4): 199–206.

Abstract: The present paper deals with the study of 72 weed species belonging to 63 genera and 26 families occurring around the Patanjali Yogpeeth, Haridwar. The botanical name, family and plant parts used for each species are given along with its medicinal uses. Out of 26 families, Asteraceae and Fabaceae appeared to be dominant with 11 species, Amaranthaceae with 6 species, Solanaceae with 5 species, Euphorbiaceae with 4 species and Brassicaceae with 3 species.

2399. **Ballabha, R., Singh, D., Tiwari, J.K. & Tiwari, P. 2013.** "Diversity and availability status of ethno-medicinal plants in the Lohba range of Kedarnath Forest Division (KFD), Garhwal Himalaya". *Global J. Res. Med. Pl. & Indigenous Med.* 2(4): 198–212.

Abstract: The present study has been carried out in the Lohba range of the Kedarnath Forest Division, Garhwal Himalaya to document the diversity, ethno-medicinal uses and availability status of medicinal plants. The inhabitants of the region are dependent up to a large extent on wild resources for their therapeutic needs. The region is rich in ethnomedicinal plant diversity. A total of 140 species belonging to 126 genera and 64 families were recorded from the study area. Out of the documented species 69 were herbs, 37 shrubs, 23 trees and the rest 11 were climbers. Out of the recorded plant species, 17 were abundant, 83 common and 40 uncommon to this area. Plant parts are used to cure cold, cough, fever, stomach disorders, joints pain, eye diseases, healing of cuts and wounds, toothache, etc. This study will be helpful in developing a comprehensive data base on the medicinal plant resources to strengthen the health care system in the area and in conserving the traditional knowledge for the prosperity of the remote village areas.

2400. **Ballabha, R., Rawat, D.S., Tiwari, J.K., Tiwari, P. & Gairola, A. 2013.** "Wild edible plant resources of the Lohba range of Kedarnath Forest Division (KFD), Garhwal Himalaya, India". *Int. Res. J. Biol. Sci.* 2(11): 65–73.

Abstract: The present study was carried out in the Lohba range of the Kedarnath Forest Division, Garhwal Himalaya to document the diversity, indigenous uses and availability status of wild edible plants. The inhabitants of the region are dependent up to a large extent on wild resources for their food and other daily needs. The region is rich in wild edible plant resources. A total of 82 species belonging to 62 genera and 46 families were documented from the study area. Out of the recorded species 24 were herbs, 23 shrubs, 28 trees and the rest 7 were climbers. Among the documented plants, 15 were abundant, 46 common and 21 uncommon to this area. Plant parts such as leaves, shoots, young twigs, roots, rhizomes, tubers, flowers, fruits, seeds, etc. are used for food by the local people. The study will be helpful in developing a comprehensive data base on wild plant resources, strengthening the food security in area and in conserving the traditional knowledge for the prosperity of the remote areas.

2401. **Balodi, B. 1988.** "Introductory note on the ethnobotany of Gori valley". *J. Econ Taxon. Bot.* 12(2): 453–455.

Abstract: In the present paper twelve plants reported from Gori valley which has ethnobotanical value.

2402. **Balodi, B. & Rao, R.R. 1998.** "Some wild edible and medicinal plants used by adivasis of Garhwal and Kumaon Himalaya". *Ann. Forest.* 6(1): 18–30.

Abstract: Garhwal and Kumaon region is the home to a number of Adivasi communities who inhabit mostly the inner Himalayan regions. The migratory nature and isolation from the modern amenities have made them dependent on natural biological resources, both plant and animal, to fulfil their day to day needs. The present paper deals with 87 edible and 59 medicinal plants used by these communities in this region.

2403. **Balodi, K.N., Purohit, M.V., Sridhar, V. & Arunachalam, K. 2018.** "Ethno-medicinal uses of various plants species among the Jaad Bhotiya community of Uttarakhand, Western Himalaya". *Stud. Ethno-Med.* 12(3): 189–197.

Abstract: The Jaad Bhotiya tribal community of Bhagirathi valley is known for their transhumance practices in Uttarakhand. The present paper is the result of a preliminary investigation, which was conducted to understand the traditional healthcare practices and use of plant species in various remedies by the Jaad people. A total 39 plant species are documented to be used in traditional medicine which revealed that the indigenous knowledge system still serves effectively for the well-being of the Jaad community. However, the knowledge was limited to older generation while the younger ones remain deprived of such knowledge. It was also found that various medicinal plants species are less abundant than earlier in the region which is believed due to the ever-increasing anthropogenic drivers and impacts of climate change. The current utilization pattern and limited transfer of knowledge are disparaging to the sustainability of plant resource in the region and indigenous system for human well-being.

2404. **Bartwal, A., Negi, G.S. & Badoni, P.P. 2002.** "Traditional therapeutic methods of Tehri Garhwal". *Himal. Chem. & Pharmaceut. Bull.* 18–19: 24–28.

2405. **Bartwal, M., Chandra, V. & Rajwar, G.S. 2011.** "Ethnomedicinal plant diversity among the Jaunsaries Tons valley, Uttarakhand". *J. Non-Timber Forest Prod.* 18(3): 231–236.

Abstract: The term Ethnobotany in a broad sense refer to the study of plant and man interaction and traditional uses of the biota by observation of nature by indigenous people. Traditional knowledge of local peoples about natural resources is very valuable and useful. Apart from dealing with the scientific/taxonomical data of plants, ethnobotany also involves preparation of local vegetational account, recording the association of plant with the people in the same habitat, its uses in medicine and others uses. There is mention of plants in folklore and religion. Ethnobotanist, thus, prepares a thorough scientific account of plants and correlates them with people. The ethnomedicinal explorations were conducted in this area with a view to collect information on the medicinal plants along with the information on their uses in traditional medicines as practiced by tribals and medicine men of the region since time immemorial.

2406. **Bhakuni, D.S. 2003.** Medicinal plants of Himalayan region of Uttaranchal. In: Agarwal, C.M. (Ed.), *Dimentions of Uttaranchal.* Indian Publishers & Distributors, New Delhi. Pp. 239–251.

2407. **Bharati, K.A. & Kumar, M. 2014.** "Traditional drugs sold by herbal healers in Haridwar, India". *Indian J. Tradit. Knowl.* 13(3): 600–605.

Abstract: The herbal healers are descendants of ancient medicine men. They sell raw herbal drugs used against various common ailments at road side. A total of 22 herbal raw samples were purchased from these healers. The information on therapeutic properties, price, dosage and duration of treatment has been documented. Out of them, 13 plant species have been identified and their medicinal properties were compared with the Indian Materia Medica. It has been observed that medicinal systems of the herbal healers are independent (only 22.22% similarities) from Indian Materia Medica.

2408. **Bhat, J.A., Kumar, M. & Bussmann, R.W. 2013.** "Ecological status and traditional knowledge of medicinal plants in Kedarnath Wildlife Sanctuary of Garhwal Himalaya, India". *J. Ethnobiol. & Ethnomed.* 9(1): 1–8.

Abstract: Himalayan forests are the most important source of medicinal plants and with useful species for the local people. Kedarnath Wildlife Sanctuary (KWLS) is situated in the interior part of the Garhwal Himalayan region. The presented study was carried out in Madhmeshwar area of KWLS for the ecological status of medicinal plants and further focused on the ethnomedicinal uses of these plants in the study area. A total of 152 medicinally important plant species were reported, in which 103 were found herbs, 32 shrubs and 17 were tree species which represented 123 genera of 61 families. A total of 18 plant species fell into the rare, endangered (critically endangered) and vulnerable status categories. The present study documented the traditional uses of medicinal plants, their ecological status and importance of these plants in the largest protected area of Garhwal Himalaya. This study can serve as baseline information on medicinal plants and could be helpful to further strengthen the conservation of this important resource.

2409. **Bhatt, B.P. & Panwar, M.S. 1990.** "Plants with fertility regulating potential of Garhwal Himalayas". *J. Econ. Bot. Phytochem.* 11(1): 33–34.

2410. **Bhatt, D., Joshi, G.C. & Tewari, L.M. 2009.** "Culture, habitat and ethno-medicinal practices by Bhotia tribe people of Dharchula region of Pithoragarh district in Kumaun Himalaya, Uttarakhand". *Ethnobot. Leaflets* 13: 975–983.

Abstract: A survey in different areas of Dharchula region in Pithoragarh district of Uttarakhand was conducted in different seasons of the year to identify the non-conventional uses of plants. In India, there are about 68 million people belonging to 227 ethnic groups and comprising of 573 tribal communities. Out of which 4 tribes (Tharus, Buxas, Rajis and Bhotias) inhabit the Kumaun division of the state. The Bhotia tribe living in remote thick forest of the Dharchula region depends on nature for their basic needs of life. The 8 major Bhotia groups in the state are i.e. Johari, Juthora, Darmi, Chudans, Byansi, Marccha, Tolcha and Jad. The tribal population of Bhotia community is 8.13% and inhabited in about 18.70% of area of the country. The present study was carried out to document the precious indigenous traditional knowledge about the ethno-medicinal uses and properties of plants which are under Red Data List of IUCN. Ethno-medicinal information on 17 plant species belonging 15 families, used in various ailments by the inhabitants of the community was recorded. The attempt is also made to describe the habitat, customs and economical aspects of Bhotia tribes.

2411. **Bhatt, D., Joshi, G.C., Tewari, L.M. & Kumar, R. 2017.** "Diversity and use pattern of ethno-medicinal plants of Kumaun Himalaya". *J. Res. Biol.* 7(3): 2205–2230.

Abstract: Kumaun Himalaya, in the Indian Himalayan region, has a rich diversity of medicinal plants, which are widely used in traditional medicinal systems. The present paper concludes the diversity, vernacular names, associated authorship, ethnomedicinal uses and use pattern, life form; plant part used and accession number of the medicinal flora together. The paper describes distribution and local/traditional uses of the 256 medicinal plants representing 96 families, in which pteridophytes were 1%, trees were 18%, shrubs were 25%, herbs were 52%). Various plant parts used in formulations, such as: underground part- 33%, leaves- 24%, whole plant- 11%, bark7%, seeds- 7%, resin /latex/oil- 4%, stem/ shoot/ wood- 4%, flowers and inflorescences- 5%, fruits and nuts- 5% were used in different ailments.

2412. **Bhatt, D., Kumar, R., Joshi, G.C. & Tewari, L.M. 2013.** "Indigenous uses of medicinal plants by the Vanraji tribes of Kumaun Himalaya, India". *J. Med. Pl. Res.* 7(37): 2747–2754.

Abstract: The uses of medicinal plants in traditional healthcare practices and its importance in providing clues to new areas of research and in biodiversity conservation is now well recognized. This study aimed to look into the diversity of plant resources that are used by Raji people for curing various ailments. Questionnaire surveys, participatory observations and field visits were elicit information on the uses of various plants. It was found that 48 plant species were used by local people for curing various diseases, which are categorized under 14 broad classes.

2413. **Bhatt, D., Sharma, P., Sharma, L. & Joshi, G.C. 2012.** "Folk herbal remedies for skin care in Kumaun Himalaya". *J. Non-Timber Forest Prod.* 19(4): 309–312.

Abstract: The value of medicinal plants in traditional healthcare practices provides clues to latest areas of research. However, information on the uses of plants for medicine is deficient from interior areas of Himalaya. Keeping this in view, the present study has been conducted to highlight the medicinal values of some plant used for the skin care by the natives of Kumaun Himalaya, a province of Uttarakhand. Ethno-botanical assessment of 24 plant species belonging to 18 families used by the local people for curing the different skin ailments including boils and blisters, itching, wounds and cuts, skin irruption, leprosy etc. were recorded. Plant name, local name and traditional uses are described in the paper for each plant. The aim of the study is to document the traditional therapies diminishing day by day.

2414. **Bhatt, K.C. 1990.** *Ethnobotanical study of some remote areas of Pithoragarh and Chamoli districts.* Ph. D. Thesis. H.N.B. Garhwal University, Srinagar. (unpublished)

2415. **Bhatt, K.C. & Gaur, R.D. 1992.** "A contribution to ethnobotany of Rajis in Pithoragarh district". *Acta Bot. Ind.* 20: 76–83.

2416. **Bhatt, K.C. & Silas, R.A. 1989–1990.** "Traditional beverages and their importance in the folk life of Bhotiyas in U.P. Himalaya". *J. Himal. Stud. Reg. Develop.* 13-14: 56–62.

2417. **Bhatt, K.C., Bisht, M.K. & Gaur, R.D. 1987.** "Folk-medicines in Byans valley in Pithoragarh, U.P. Himalaya". *J. Himal. Stud. Reg. Develop.* 11(12): 117–123.

Abstract: Byans valley in the Pithoragarh district is one of the most attractive valleys of Central Himalaya, representing rich vegetation. 'Bhotias' are the semi-nomadic aborigines in the Valley. They are locally known as 'Byansi". These tribals have their own cultural traditions and folk beliefs. Their main occupation is agriculture, sheep rearing and marketing of a few wild species. Most of their requirements including medical treatment, are fulfilled from the local vegetation. This paper pertains to the ethnomedicinal investigations of this society. The information has been col-lected from the local folks on some important medicinal plants and their uses. Some of the useful plant species utilized by the inhabitants are *Aconitum atrox, A. heterophyllum, Angelica glauca, Arnebia benthamii, Bergenia lingulata, Codonopsis viridis, Dactylorhiza hatagirea, Dioscorea deltoidea, Ephedra gerardiana, Geranium wallichianum, Hyoscyamus niger, Iris kumaonensis, Mardostachys grandinlora, Onosma echioides, Paris polyphylla, Podophyllum hexandrum, Rheum moorcroftianum* and others.

2418. **Bhatt, K.C., Bisht, M.K. & Gaur, R.D. 1991.** "Flavouring and masticatory plants: A case study of Bhotias". *J. Econ. Taxon. Bot.* 15(1): 41–45.

Abstract: Himalaya remained one of the most attractive centres for naturalists, scientists, tourists and others, since a long past. It has a rich vegetational wealth and different groups of people are inhabited in the remote pockets of this zone. Bhotias are one of the nomadic populations especially famous for their culture and folk beliefs. Most of their basic nedds are fulfilled from the local vegetational wealth. This paper pertains to the ethnobotanical investigation of some important flavouring and masticatory plants of these aborigins. The important plants species utilized by the native are *Allium stracheyi, Angelica glauca, Bergenia stracheyi, Hyoscyamus niger, Oxyria digyna, Thymus linearis, Rhododendron arboretum, Viola pilosa, Woodfordia fruticosa* and others.

2419. **Bhatt, V.P. 1994.** Ethnomedicine of pilgrims at Badrinath, the holy Himalayan shrine of Hindus. Abstract- 4th International Congress on Ethnobiology, *Ethnobiology in Human Welfare,* November 1994. NBRI, Lucknow. P. 144.

2420. **Bhatt, V.P. 1999.** "Ethnobiology of high altitude Himalayan communities in district Chamoli: A conservation perspective". *Zoo's Print J.* November I-XIV (2-11): 137–146.

2421. **Bhatt, V.P. & Negi, G.C.S. 2006.** "Ethnomedicinal plant resources of Jaunsari tribe of Garhwal Himalaya, Uttaranchal". *Indian J. Tradit. Knowl.* 5(3): 331–335.

Abstract: An attempt has been made to evaluate plants used for medicare by the tribal people of the Jaunsar area of Garhwal Himalayas. The study reveals the indigenous medicinal uses of 66 plant species belonging to 52 genera and 41 families by the tribal people of Jaunsar. Ethnomedicinal uses of 17 species recorded in the paper are the first report from the region. Documentation of traditional knowledge on the ethnomedicinal uses of these plants is essential for conservation efforts for the plant resources and new drug development.

2422. **Bhatt, V.P. & Vashishtha, D.P. 2008.** "Indigenous plants in traditional healthcare system in Kedarnath valley of western Himalaya". *Indian J. Tradit. Knowl.* 7: 300–310.

Abstract: The study deals with the indigenous plants used in traditional healthcare in

Kedarnath valley of Uttarakhand in western Himalaya. A total 130 plant species belonging to 94 genera and 62 families have been identified. Of these, 21 species are trees, 19 species are shrubs and 90 species are herbs. These species diversity are described for their distribution, utilisation pattern, and indigenous uses. The roots, rhizomes, bulbs, stems, tubers, leaves, barks, fruits and seeds are used for treatment of different ailments. The plants are rare (30 spp.), endangered (15 spp.), and vulnerable (3 spp.) and common (82 spp.). As per their population structure, several anthropogenic and natural causes are analysed for their threatened status. The study is a first attempt to study the medicinal plants of the Kedarnath valley area. Documentation of traditional knowledge on the ethnomedicinal use of these plants was studied.

2423. **Bhattacharyya, G., Joshi, G.C. & Tewari, L.M. 2010.** "New plant records of traditional medicine from Ranikhet". *J. Econ. Taxon. Bot.* 34(4): 719–724.

Abstract: In the present short reseach communication, botanical identification of some plants which are used in folk medicine from Kumaun Himalaya have been described. These plants have not been reported earlier from Ranikhet region as herbal medicine. The plants described here were found and identified during an ecological, floristic survey in a forest ecosystem of Kumaun. The plants have been recognised as an indigenous flora of the area. Their medicinal uses by the local and tribal people of Ranikhet are being described for the first time.

2424. **Bisht, A. & Jain, S.P. 2006.** "Review of ethnobotanical studies of genus *Rubus* (Rosaceae) from North-Western Himalayas". *Ethnobotany* 18: 127–130.

Abstract: Ethnobotanical uses of 15 species of the genus *Rubus* from North-Western Himalayas are discussed based on survey and consultation of published literature. The study reveals that *E. ellipticus* and *R. pedunculosus* are commercially cultivated in some parts of India, because they have industrial significance; the rest of the species are used by various tribals and local communities for treating different diseases in the area under study.

2425. **Bisht, A.S. & Bhatt, A.B. 2012.** "A contribution of the medicinal plants of Sahastradhara, district Dehradun, Uttarakhand (with ethnobotanical notes)". *J. Drug Delivery & Therapeutics* 2(5): 114–120.

Abstract: The Himalaya with gushing rivers, alpine meadows, majestic snow claded peaks, enhancing lakes and a rich diverse flora and fauna is rightly described as the " abode of God'. Garhwal Himalaya provides enormous benefits to the human being in the form of shelter, food, water, medicine, fuel and industrial products and fodder. Further it has the potential for providing many more benefits still unknown. The plants protect topsoil, ensure the quality of the water and provide food etc, for all other living beings of the biosphere. Biological extinction has been a natural phenomenon in the geological past however man's interference has speeded extinction at a faster rate. Human beings are involved in destroying the vegetation at an alarming rate resulting in the loss of biodiversity of the biosphere. Himalayan resources are being depleted and converted in to ash each day through biotic pressure coupled with undisciplined exploitation, damage and destruction.

2426. **Bisht, A.S. & Sharma, K.D. 2014.** "Plants utilization by the communities of Bharsar and adjoining area of Pauri Garhwal district, Uttarakhand, India". *Biodiversitas* 15(1): 94–100.

Abstract: Garhwal Himalaya possesses luxuriant a varied vegetation with in the Himalaya region. Almost every plant has economic value in the form of shelter, food, water, medicine, fuel and industrial products and fodder. Surveys were conducted in entire Bharsar, Pauri Garhwal district of Uttarakhand, India in order to get information on traditional uses of plants by local inhabitants. A total of 138 plants were collected that some species had more than one function of which 39 species of vegetables, 28 species of medicinal plants, 19 species of fruits, 18 species of ornamental flowers, 12 species of forest plants, 7 species of agroforestry and social forestry, 8 species of spices and condiments, 6 species of minor cereal crop plants, 5 species of pulses, and 4 species of oil seed plants were found economically important as they are used by the people frequently for various purposes.

2427. **Bisht, C. & Badoni, A. 2009a.** "Medicinal strength of some alpine and sub-alpine zones of western Himalaya, India". *New York Sci. J.* 2(5): 41–46.

Abstract: The Uttarakhand region is the easternmost part of the Western Himalaya. The vegetational wealth of Western Himalaya is well known since ancient time. The varying topographic conditions of this region thrive on different types of vegetation. It has a rich medicinal plant flora of over 1000 documented species having medicinal value. Out of these, more than 700 species are much in use in the country, mostly by local people living in the villages as a household remedy in several diseases. With the increasing biotic pressure, the forests and alpines are getting degraded and in the process ground flora and shrubs which happen to provide bulk of the medicinal plants are also under strain. In the present study a field survey made from August to December 2008 in four alpine and sub-alpine zone viz. Tungnath of district Rudraprayg and Rudranath, Mandal and Valley of Flower of district Chamoli in order to refine the medicinal strength of above places. The altitudinal range, local name, part used, use/cure and status of some important medicinal plants are compiled based on the earlier publications as well as personal communication with local persons, rural folks and vaidyas.

2428. **Bisht, C. & Badoni, A. 2009b.** "Distribution and indigenous uses of some medicinal plants in district Uttarkashi, Uttarakhand, India". *Researcher* 1(6): 38–40.

Abstract: The present study was based on a field survey in district Uttarkashi of Uttarakhand, to find the plants of medicinal values. Twelve species of plants are used as medicine.

2429. **Bisht, D.S. & Pundir, Y.P.S. 2008.** "Wild medicinal plants of Jaunsar-Bawar (Western Himalayas), Uttarakhand- II". *Indian Forester* 134(5): 674–686.

Abstract: The paper reports 67 wild medicinal plants used by the natives of Jaunsar-Bawar (Western Himalayas), Uttarakhand.

2430. **Bisht, D.S. & Pundir, Y.P.S. 2014.** "Wild medicinal plants of Jaunsar-Bawar, Western Himalaya, Uttarakhand". *Indian Forester* 140(12): 1202–1212.

Abstract: The paper reports seven wild medicinal plants used by the natives of Jaunsar-Bawar (Western Himalaya), Uttarakhand. A list of additional 116 wild medicinal plants already reported from this area by the authors is also given.

2431. **Bisht, M.K. & Badoni, A.K. 1990.** "Araceae in the folk life of the tribal populace in Garhwal Himalaya". *J. Econ. Bot. Phytochem.* 1: 21–24.

2432. **Bisht, M.K., Bhatt, K.C. & Gaur, R.D. 1988.** Folk medicines of Arakot valley in district Uttarkashi: An ethnobotanical study. In: Kaushik, P. (Ed.), *Indigenous Medicinal Plants.* Today & Tomorrow Printers & Publishers, New Delhi. Pp. 157–166.

2433. **Bisht, N., Pande, P.C. & Tiwari, L. 2004.** "Ethno-veterinary practices of Kapkot block of Bageshwar district, Uttaranchal". *Asian Agri-Hist.* 8(4): 309–314.

2434. **Bisht, N.S., Gera, M., Sultan, Z. & Gusain, M.S. 2005.** "Status of collection, cultivation and marketing of medicinal and aromatic plants in Pithoragarh, Uttaranchal". *Indian Forester* 131(3): 346–357.

Abstract: The status of collection, cultivation and marketing of medicinal and aromatic plants was studied in Pithoragarh district of Uttaranchal. The primary information was collected as per structured questionnaires from collectors/cultivators belonging to twelve villages spread over two blocks namely Munsiyari and Didihat. The important species being collected were observed to be Jhula, Reetha and Tejpat. The cultivators seem to be growing greater quantities of Atees, Gudhvach, Indrayan, Jambo, Jatamansi, Kalajeera, Kutki, Pashanbhed, Reetha, Sameva and Tejpat. The most favoured market channel ws onserved to be Producer Middlemn Trader Consumer which was being adopted by 50% collectors and 90% cultivators. The producer's share in consumer's rupee in case of collection varied between 45-76.47% for different species with an average of 56.22%. Similarly the producer's share in consumer's rupee for cultivated species varied between 32.67-89% with an average of 60.88%. The paper also discusses the recent changes introduced by Uttaranchal Government in marketing of these medicinal and aromatic plant species.

2435. **Bisht, S. 2014.** *Structure Composition and Vegetational Analysis of Tarkeshwar Sacred Grove in Garhwal Himalaya.* Ph. D. Thesis. H.N.B. Garhwal University, Srinagar. (unpublished).

2436. **Bisht, S. & Ghildyal, J.C. 2007b.** "Medicinal plant diversity within Tarkeshwar Sacred Grove in Garhwal Himalaya". *ENVIS Forest. Bull. (Medicinal Plants Special)* 7(2): 40–45.

2437. **Bisht, S., Ghildyal, J.C. & Rawat, T.S. 2007.** The sacred tradition of conservation: Sacred groves in India. In: Todria, N.P., Chamola, B.P. & Chauhan, D.S. (Eds.), *Concepts in Forestry Research.* International Book Distributors, Dehradun. Pp. 33–40.

2438. **Bisht, S.L., Dobhal, P. & Sharma, N. 2008.** "Medicinal weeds of rice crop of Doon valley". *Ann. Forest.* 16(1): 119–123.

Abstract: An ethnobotanical study has been conducted to identify the medicinal weeds of rice fields of Doon valley and to find out the possibilities of utilizing these weeds. The weeds were collected through intensive visits and information on potential uses was collected with the help of local people and published literature. The study revealed

that out of 48 problematic weeds in rice crop, 31 weed species possess medicinal properties.

2439. **Bisht, T.S. & Bhatt, A.B. 2011.** Sacred groves: A traditional way of conserving biodiversity in Garhwal Himalaya, Uttarakhand. In: Gokhale, Y. & Negi, A.K. (Eds.), *Community Based Biodiversity Conservation in the Himalayas*. The Energy and Resource Institute (TERI), New Delhi. Pp. 61–73.

2440. **Bisht, V.K. & Purohit, V. 2010.** "Medicinal and aromatic plants diversity of Asteraceae in Uttarakhand". *Nature & Sci.* 8: 121–128.

Abstract: Geographically Uttarakhand represents six eco-climatic regions from 300 m asl to 7817 m asl, and abode to a variety of medicinal and aromatic plants, and their products are being used by local communities from time immemorial. Asteraceae is the largest family of medicinal and aromatic plants in Uttarakhand. The species of the family are growing from low altitude of Tarai Bhabar to the alpine. There are annual, biennial or perennial herbs, under shrubs, shrubs. This paper includes the database on various aspects of medicinal plants of the family Asteraceae in the state. The database on various aspects includes species richness, genera richness, medicinal use and altitude for the different species of the family Asteraceae. Total of 85 species of medicinal and aromatic plants with 54 genera of Asteraceae from Uttarakhand were recorded in the present paper.

2441. **Bisht, V.K., Negi, J.S., Bhandari, A.K. & Sundriyal, R.C. 2011.** "Anti-cancerous plants of Uttarakhand Himalaya: A review". *Int. J. Cancer Res.* 7(3): 192–208.

Abstract: Cancer is one of the leading causes of death worldwide. Anti-cancerous activity is the effects of natural, synthetic or biological chemical agents to reverse, suppress or prevent carcinogenic progression. Several synthetic agents are used to cure the disease but they have their toxicity and hence the research is going on the investigate the plant derived chemotherapeutic agents. An attempt has been made to review important medicinal plants used for the treatment and prevention of neoplasm from Uttarakhand. This article considered 24 plants from the state having anti-cancerous property. These plants contain several anti-cancerous bioactives such as saponins, flavonoids, polyphenols, tannins and alkaloids etc. This study also imcorporates the ethno-botany and biological activities of these important plants.

2442. **Bisht, V.K., Kandari, L.S., Negi, J.S., Bhandari, A.K. & Sundriyal, R.C. 2013.** "Traditional use of medicinal plants in district Chamoli, Uttarakhand, India". *J. Med. Pl. Res.* 7(15): 918–929.

Abstract: Uttarakhand has a rich wisdom of traditional system of medicine since time immemorial. There is urgent need to document the medicinal and aromatic plants associated traditional knowledge which is vulnerable to shrink. Present study is an attempt to document the traditional system of medicine; used by the native communities of district Chamoli, Uttarakhand, India. On the basis of semi-structural questionnaire and in consultation with the local herbal practitioner (Vaidyas), 124 species belonging to 59 families and 108 genera, used for the treatment of 39 diseases were documented. About 38% of the species were used for their roots/rhizomes, followed by leaves (28%), fruits/seeds (10%) and whole plant (6%). Seeds, barks, flowers, twigs/branch

and gum of less than 5% species were used for curing diverse form of diseases. About 16% of the recorded species were used for treating fever (20 spp.), 14% for skin diseases, 12% for Joint pains, 8% for cough and cold and stomach related disorders and 7% for blood pressure. 58 plants were used to cure more than one ailment, while 66 plants were used for single therapeutic application. Most of the species used in traditional healthcare in the region were harvested from wild. As a result of destructive harvesting, 13 species out of 124 recorded species are enlisted as threatened in Uttarakhand. Among these, 5 are critically rare, 5 are endangered and 3 are in vulnerable category. This study thus underlines the importance of traditional knowledge associated with medicinal and aromatic plants used for the treatment of different diseases.

2443. **Bisht, V.K., Rana, C.S., Negi, J.S., Bhandari, A.K., Purohit, V., Kuniyal, C.P. & Sundriyal, R.C. 2012.** "Lamiaceous ethno-medico-botanicals in Uttarakhand Himalaya, India". *J. Med. Pl. Res.* 6(26): 4281–4291.

Abstract: Based on literature and field surveys, and a collective analysis of available information, this enumeration is an attempt to draw attention to the medicinal and aromatic plants belonging to Lamiaceae family. This enumeration narrates the plants having diverse ethno-medico-botanical values. Findings of this exercise indicated that, plants belonging to 25 genera and 46 species are used by native communities for treating 40 common ailments, especially those, which are prevalent in the mountain environment. An attempt has been made to accumulate the information on the distribution, habit and habitat of important plants. Also, scientific documentation of the plants such as prior reporting with ethno-botanical notes has been provided in this study. It is thought that, these endeavours will be helpful for utilization of such plants for mass benefits of locally communities as locally available and time tested renewable resource for generating income.

2444. **Biswas, S., Chandra, S., Jain, S.S. & Pal, M. 2005.** Indigenous knowledge on Himalayan flora for conservation and benefit sharing. In: Rawat, J.K., Srivastava, S., Biswas, S. & Vashishta, H.B. (Eds.), *Proceedings of Workshop on Conservation of Biodiversity in India– Status, Challenges and Efforts.* ICFRE-FRI, Dehradun. Pp. 152–156.

2445. **Bohra, N., Tewari, L.M. & Tewari, A. 2017.** "Ethnobotany of wild edible plants traditionally used by the local people in the Ramnagar region from Nainital district, Uttarakhand, India". *Biolife* 5(1): 12–19.

Abstract: The present investigation deals with the ethnobotanical study conducted during the year 2014-2016 to collect,identify and record the wild edible plants(WEPs) used by the local as well as tribal people inhabiting in ruralareas in the Uttarakhand state of ramnagar region of district Nainital, India. A total of 59 plant species belonging to 36 families are reported in this paper based on an ethnobotanical field study. The four major lifeforms were herbs, shrubs, climbers and trees. Trees (56%) made the highest proportion in this communicationof the edible plant species followed by shrubs (25%), herbs (13%) and climbers (6%). Fruit, seed and leaves arefound as most preferred edible plant parts. The plant species are arranged in alphabetical

order by their botanical name with family, habit, altitudinal range (m), flowering and fruiting period, local name, part/sused and ethnobotanical use.

2446. **Chandola, V. & Nautiyal, A.R. 2017.** "Ethnomedicinal study on the Bhotiya tribe in Chhinka village, Chamoli, Uttarakhand, India". *J. Non-Timber Forest Prod.* 24(3): 153–158.

Abstract: The current study was designed to survey the ethno-medicinal knowledge of a tribal community, the Bhotiya. The people of this community have rich ethno-botanic knowledge but due to rapid socio economic changes in mountains, the heritage of knowledge held within the elders is diminishing, and so proper documentation is a need. A door to door questionnaire survey on traditional medicinal knowledge was conducted during frequent visits from December 2012 to May 2013 at the Chhinka village. A total of 34 plants being used medicinally were identified. Out of these 24 (70.5%) were wild and 10 (29.5%) were cultivated. There was great agreement among the informants regarding ethno-medicinal uses of plants with Factor of Informants Consensus (FIC) value ranging from 0.50 to 1.00, with an average value of 0.80. The results show that herbal formulations can actually do wonders in treating some small issues immediately, while severe ones after prolonged use.

2447. **Chandra, K. 1985.** "Traditional remedies of Baharaich and Gonda district of Uttar Pradesh". *Sachitra Ayurveda* 37(8): 483–486.

2448. **Chandra, K., Nautiyal, B.P. & Nautiyal, M.C. 2013.** "Ethno-botanical resources as supplementary foods and less known wild edible fruits in district Rudraprayag, Uttarakhand". *Indian J. Human Ecol.* 42(3): 259–27l.

Abstract: Surveys were conducted in entire Rudraprayag district of Garhwal, Uttarakhand, India in order to get information on traditional uses of plants by local inhabitants. A total of 700 plants were collected of which 282 species were found economically important as they are used by the people frequently for various purposes. A total of 20 species were used as supplementary food items for the preparation of traditional recipe or as an alternative during work far from the house and during the scarcity of primary food items. Similarly, 38 species are used as vegetables, many of which are commonly used and 48 wild species of edible or less known fruits. Besides other uses, species used as supplementary food, vegetables and fruits are only described here with traditional recipes.

2449. **Chandra, S. & Rawat, D.S. 2015.** "Medicinal plants of the family Caryophyllaceae: A review of ethno-medicinal uses and pharmacological properties". *Integrative Med. Res.* 4(3): 123–131.

Abstract: Several species of the family Caryophyllaceae are widely used by many ethnic communities as traditional medicine throughout the world. The highest number of plants of the family are used in Chinese traditional medicine. The ethnopharmacologial studies of this family indicate that plants of the family possess anticancer, antibacterial, antifungal, antiviral, antioxidant, and anti-inflammatory properties. Other miscellaneous properties reported are ribosome inactivation properties, inhibition of prostatic enlargement in rats, and inhibition of intestinal enzyme carboxyelasterase in rats, cerebro-protective activity, and antiobesity in rats. Few reviews have been published yet, providing information regarding medicinal plants of the family and their biomedical properties. All published reviews have focused either on a particular taxa or a few species. The present review is focused on the traditional medicinal uses of the plants of the family Caryophyllaceae along with phytochemical and pharmacological studies of the family. A study of the literature revealed significant traditional medicinal importance of the family. Major chemical constituents of Caryophyllceae are saponins, Phytoecdysteroids, benzenoids, phenyl propanoids, and nitrogen containing compounds. The most important property of plants of the family is anticancer activity and is shown by the large number of plant species studied. This review of traditional medicinal and pharmacological uses of plants of the family, provide a ground for future research in the family.

2450. **Chandra, V. & Chandra, S. 2008.** "Wild edible plants of Jaunsar-Bawar (Dehradun)–I: Fruits". *Int. J. Forest Usefruct. Mgmt.* 9(2): 7–20.

2451. **Chantia, A. 2003.** "Traditional knowledge of ethnomedicine in Jaunsar-Bawar, Dehra Dun". *Indian J. Tradit. Knowl.* 2(4): 397–399.

Abstract: In Jaunsar-bawar area (Chakrata tehsil of Dehradun district), different kinds of medical practitioners (priests, magicians, exorcists and quacks) abound. Many cures are affected by one or more persons treating a single patient at a time or in succession. In traditional societies, herbalists and midwives frequently acquire their skills from their mothers or other close relatives. In most of these rural societies, their localities are almost bereft of modern health facilities. In such a situation, they use their traditional knowledge about the locally available plants to cure many diseases. In this paper, an attempt has been made to see how these ethnomedicines are useful in Jaunsar-bawar to maintain their healthy life.

2452. **Chaturvedi, A., Tiwari, A.K. & Mani, R.J. 2017.** "Traditional practices of using various medicinal plants during postnatal care in Chitrakoot district". *Indian J. Tradit. Knowl.* 16(4): 605–613.

Abstract: Chitrakoot district, a remote area located in the Bundelkhand region of Uttar Pradesh has very strong local health traditions in which plants play a key role. The region has well developed indigenous practices for taking care of mother and child right after the delivery. There are traditional delicacies with medicinal value and herbal formulations meant for oral and external applications that are exclusively used for postnatal care of mother and child. These health practices are on decline. The present study highlights the potential of traditional methods of postnatal care and the need for their documentation. These practices if integrated with modern healthcare system could elevate the health status of thousands of ladies and their newborns.

2453. **Chauhan, D.S. & Bhatt, S. 2010.** Medicinal plant wealth in Uttarakhand: Present status, threats and future prospects. In: Uniyal, P.L., Chamola, B.P. & Semwal, D.P. (Eds.), *The Plant Wealth of Uttarakhand.* Jagadambica Publishing Co., New Delhi. Pp. 353–368.

2454. **Chauhan, M.S. & Bhattacharya, A. 1992.** "A contribution to the ethnobotany of Pokhari block, Chamoli, Garhwal, U.P. Himlaya". *J. Econ. Taxon. Bot.,* Addl. Ser. 10: 129–136.

Abstract: The present paper incorporates the results of an ethnobotanical study conducted in a small part of Pokhari block, district Chamoli in Garhwal Himalaya. The various uses of some wild plants species for food, medicine, fibre, house building materials, fodder, etc. by the local inhabitants in this Himalayan region have been discussed.

2455. **Chopra, N., Pandey, N., Tewari, L.M. & Tewari, A. 2019.** "Floristic composition of ethnomedicinal plants used by indigenous people in Tarai region, Kumaun Himalaya". *J. Med. Pl. Stud.* 7(4): 139–143.

Abstract: Tarai region comprises with coarse gravel and deposits. This region is very rich in fauna and flora. The Tarai belt having long and narrow strips of and separates the upper limits of Gangetic plains. The study was conducted for the documentation of ethno-medicinal use of plants from Tarai region, Kumaun Himalaya. Study was conducted in Tarai region of Kumaun in order to collect information from respondent including both men and women. PRA technique was used to collect the information. Total 70 ethno-medicinal plant species belonging to 33 families, 61 genera were recorded and different habitats such as herbs (44%), trees (29%), shrubs (24%), climbers (3%), which were further classify according to plants parts used such as: root (22%), leaves and whole plants (17%), bark (9%), fruits (8%), stem-bark (6%), seeds (5%), flowers and rhizome (3%) and gum (2%). It was found that 70 medicinal plant species were used by local people for curing 48 diseases such as dysentery, diarrhea, cough, skin diseases, asthma, fever, piles, bronchitis, rheumatism, cold, cut and wounds, eye diseases etc.

2456. **Chowdhary, S., Kumar, H. & Verma, D.L. 2009.** "Biodiversity and traditional knowledge of *Bergenia* spp. in Kumaun Himalaya". *New York Sci. J.* 2(6): 105–108.

Abstract: Kumaum Himalaya is rich in biodiversity and home of several medicinal plants. Our ancestors were aware of the medicinal values of Pashanbheda and proves are our ancient literatures like Ayurveda, Charak Samhita, Susrata Samhita and Vagbhata which were known as divine truth of this plant. *Berginia ligulata* is a well known Indian drugs, referred to as PASHANBHEDA or STONE BREAKER. In this paper, an attempt has been made to collect traditional data of total diseases from tribes of Kumaon Himalaya on the ailments cured by Pashanbheda (*B. ligulata*).

2457. **Dangwal, L.R. 2015.** "Ethnomedicinal plants used for the treatment of diabetes among the villagers of Narendra Nagar block, district Tehri Garhwal, Uttarakhand, India". *World J. Pharmacy & Pharmaceut. Sci.* 4(9): 1178–1184.

Abstract: Uttarakhand state has 13 districts; out of these one of the botanically interesting district in the state of Uttarakhand is Tehri Garhwal which sustains unique and rich vegetation in wide range of habitats from Tarai- Bhabar tracts (275-4258 m a.s.l) to the high range of lesser Himalaya. It lies in between 30°10'–30°17' N latitude and 78°18'–78°30' E longitude in Northern part of Western Himalaya. It is surrounded by the district Rudraprayag in the East, Dehradun in the West, Uttarkashi in the North and Pauri in the South. Due to the close associationship of forest vegetation the habitant have great faith in traditional knowledge of plants and their uses? Ethno medicinal information on 30 plants species belonging to 20 families has been included in the present communication, which are being used for the treatment of diabetes. Information on traditional formulation, mode of administration and the ailments for which they are effective, a part from botanical and local names has been provided. The medicines consist of a single drug in the form of decoction, extract, powder etc. These are prepared from leaves, stem, bark, fruits, seeds as well as entire plants. The plants were used either separately or in combination with others. These ethno medicinal data may provide a base to start the search the new compounds related to phytochemistry, pharmacology and pharmacognosy.

2458. **Dangwal, L.R. & Sharma, A. 2010.** “Ethno-medicinal plants used to cure different diseases by peoples of Tehri district in Garhwal Himalaya, Uttarakhand”. *J. Econ. Taxon. Bot.* 34(3): 580–585.

Abstract: Garhwal Himalaya has been the reservoir of enormous natural resources including vegetational wealth. Tehri Garhwal, a hilly district in Uttarakhand state, is rich in ethno-medicinal plants. The present communication carries 45 plant species belonging to 37 families used in folk-medicine. Due to poor condition of modern health care facilities and poverty, indigenous peoples of the district fully or partially depend on local medicinal plants. An attempt has been made to document traditional knowledge from the peoples of several blocks of the district Tehri for the treatment of various diseases.

2459. **Dangwal, L.R., Rana, C.S. & Sharma, A. 2011.** “Ethnomedicinal plants from transitional zone of Nanda Devi Biosphere Reserve, District Chamoli, Uttarakhand (India)”. *Indian J. Nat. Prod. & Resources* 2(1): 116–120.

Abstract: The present communication deals with the ethno-medicinal plants of Nanda Devi Biosphere Reserve (NDBR). The study was carried out on montane region located in transitional zone of NDBR in district Chamoli, Uttarkhand, India. The inhabitants have great faith in traditional knowledge of plants and their uses. Ethno-medicinal information on 21 plant species belonging to 20 families has been included in this paper. Information on traditional formulations, mode of administration and the ailments for which they are effective, apart from botanical and local plant names has been provided. The medicines consist of a single drug in the form of decoction, extract, oil, powder and pellets. These are prepared from leaves, petiole, bark, stem, roots, flowers, seeds, latex or entire plants. In few cases, application of latex or fresh parts like flowers or simply contact of plant parts were noted. The inhabitants use different plants for some common health problems like skin ailments, cuts, wounds, cold, cough, chronic fever, headache, stomachache, urinary complaints, respiratory disorder and gynaecological problems.

2460. **Dangwal, L.R., Sharma, A. & Rana, C.S. 2010.** “Ethno-medicinal plants of the Garhwal Himalaya used to cure various diseases: A case study”. *New York Sci. J.* 3(12): 28–31.

Abstract: Garhwal Himalaya has been the reservoir of enormous natural resource including vegetational wealth. Primitive communities and tribes who live in the vicinity of forest due to being close to the nature, possess a deep practical knowledge on indigenous flora, pertaining to curatives, culture, customs, ethos, cults, religion, belief, legends, myths as well as other miscellaneous uses. The people in remote villages and tribal areas depend upon the folk medicines and household remedies to a great extent. The prevalent practice of herbal remedies has descended down from generation to generation and includes the cure from simple ailments to the most complicated one. The present communication pertains to the ethnomedicinal plants used for the treatment of various diseases and ailments like dysentery, cough, asthma, inflammation, body-ache, wound healing, bronchitis, mouth ulcer, cold, smooth delivery, headache, throat sore, constipation, diarrhea, menstrual disorders, malaria, vomiting, jaundice, mental disorder, skin diseases etc.

2461. **Dangwal, L.R., Sharma, A., Kumar, N., Rana, C.S. & Sharma, U. 2010.** "Ethno-medico botany of some aquatic angiosperms from North-West Himalaya". *Researcher* 2(4): 49–54.

Abstract: North-West Himalaya has been the reservoir of enormous natural resource including vegetation wealth, natural streams as well as rivers. The large human populace with diverse life styles, beliefs, traditions and cultural heritage inhabiting Himalaya has learnt to utilize natural resources and products in various ways. The present communication pertains to the ethno-medico botanical survey of some aquatic Angiospermae of North-West Himalaya identified 38 plant species belonging to 34 genera and 28 families used by tribals and villagers to cure numerous ailments.

2462. **Das, C.P. & Pandey, A. 2007.** "Fermentation of traditional beverages prepared by Bhotiya community of Uttaranchal Himalaya". *Indian J. Tradit. Knowl.* 6(1): 136–140.

Abstract: Balam, a wheat based starter culture, is used in several fermentation processes practiced by Bhotiya community of high altitude of Uttaranchal Himalaya. A total number of 32 microbial cultures were isolated from nine samples of Balam. Two species of Gram-positive spore forming bacteria (belonging to genus *Bacillus*) and three of yeasts (*Saccharmycopsis fibuligera, Kluyveromyces maxianus,* and *Sacharomyces* sp.) dominated the microflora of Balam. The fermentation causing microbes exhibited wide range of temperature, pH and alcohol tolerance.

2463. **Datt, B. & Lal, B. 1993.** "Less known medicinal uses of some plants from Pithoragarh district of Kumaun Himalaya, U.P.". *Aryavaidyan* 6(4): 242–246.

2464. **Datt, B. & Lal, B. 1994.** Ethnobotanical notes on some plants from Uttarkashi district of Garhwal Himalaya, U.P. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.* Addl. Ser.] 3: 263–271. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: In the present paper authors report interesting traditional uses of 20 plant species collected mainly from Gangotri, Yamunotri and Barkot areas if Uttarkashi district of U.P. The literature revealed that most of these uses are new or insufficiently known.

2465. **De, A.C. 1962.** *Folklore of Medicinal Plants of Bhagirathi Valley (Himalaya)*. Govt. Press Ceylon, Colombo.

2466. **Deoli, J., Yadav, V.K. & Pande, P.K. 2015.** "Traditional knowledge of medicinal plants in Narayanbagar block, Chamoli district of Garhwal Himalaya, Uttarakhand, India". *Indian Forester* 141(4): 389–396.

Abstract: The present study carried out in Narayanbagar block in Chamoli district of Uttarakhand in Western Himalaya to explore traditional knowledge of medicinal

plants. Most of the local people depend on the forest and agriculture produce for their livelihood and daily needs. Informations on medicinal plants were collected through questionnaire survey, formal and informal interviews. Total 136 formal interviews from 22 out of 70 randomly selected villages were carried out. A total of 146 medicinally important plant species belonging 65 families were reported. Majority of collected species were herbs (73%), followed by shrubs (14%), trees (7%) ferns (3.42%) and climbers (2%). The botanical name, family, local name, parts used, and medicinal properties of collected plants documented.

2467. **Dhaila-Adhikari, S. & Adhikari, B.S. 2007.** "Veneration of a deity by restoration of sacred grove in a village Minar, Kumaun region of Uttarakhand: A case study". *J. American Sci.* 3(2): 45–49.

Abstract: Golu Devta is a famous deity of Kumaun region of Uttarakhand, which is being worshipped by the locals. It is believed that this deity resides in the forests; however, these days due to heavy anthropogenic pressure viz. lopping, grazing, collection of Non-Timber Forest Produce and subsequent loss of forest area, the deity seems to be loosing ground to the evils of development. The local religious custom, however, protects part of the forests, where this deity resides and is worshipped. In this context, it becomes necessary to document the abode as Sacred Grove. The article impregnates and enlightens as to how a religious custom restores and preserves an area as Sacred Grove and brings people of different opinion and status in one platform. It discusses the views of some locals about the sanctity of the place and its environmental usefulness. Most of the people are unaware regarding the ecological benefits of the Sacred Groves and feel that wherever this deity rests, the place itself becomes sacred and the trees are protected and thrive. Cutting of the trees inside the groves is taboo and prohibited, even climbing on the trees is said to be avenged by the deity. The villagers believe that once the deity is established the conservation of the forest in that area is automatic and natural due to the blessings of the deity. This is an indigenous means of conserving the nature. To restore these traditional customs is to restore the biodiversity. At a time when the number of groves is declining due to modernization, urbanization and expansion of market economy, the restoration of a sacred grove indicates the attitude and behavior of community towards the environment is commendable and must be backed by all means possible, financial and administrative.

2468. **Dhaila-Adhikari, S. & Adhikari, B.S. 2008.** Sacred Groves: People's contribution to conservation. In: Rawat, G.S. (Ed.), ENVIS Bulletin Wildlife and Protected Areas 11(1): *Special Habitats and Threatened Plants of India*. Wildlife Institute of India (WII), Dehradun. Pp. 223–227.

2469. **Dhar, U., Rawal, R.S., Manjkhola, S., Bisht, A.K., Joshi, M., Bhatt, A. & Bisht, G. 2003.** *Conservation, Propogation and Utilization of High Value Medicinal Plants of Himalaya*. G.B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora.

2470. **Dhasmana, H. 1986a.** "Medicinal plants of Pauri town (Garhwal) and adjacent forest region (Part-I: Family Labiatae)". *J. Sci. Res. Pl. Med.* 4: 52–56.

2471. **Dhasmana, H. 1986b.** "Medicinal plants of Pauri town (Garhwal) and adjacent forest region (Part- 1, Family Compositae)". *J. Sci. Res. Pl. Med.* 7: 45–49.

2472. **Dhasmana, H. 1987.** "Medicinal plants of Pauri town and adjacent forest region (Pauri Garhwal)". *J. Sci. Res. Pl. Med.* 8: 1–8.

2473. **Dhiman, A.K. 2004.** *Medicinal Plants of Uttaranchal State.* Varanasi.

2474. **Dhiman, A.K. & Dhiman, S.C. 2008.** "Traditionally used antidiabetic medicinal plants of district Saharanpur, Uttar Pradesh". *J. Non-Timber Forest Prod.* 15(4): 281–284.

Abstract: This paper described 21 medicinal plants used for treatment of diabetes in Saharanpur District of Western U.P. Out of these important species are *Azadirachta indica*, *Momordica charantia*, *Phyllanthus niruri*, *Syzigium cumini*, *Trigonella foenum-graecum,* etc. Their controlling abilities have been observed excellent. Hence many Ayurvedic practitioners used these in one form or others.

2475. **Dhyani, A., Nautiyal, B.P. & Nautiyal, M.C. 2010.** "Importance of Astavarga plants in traditional systems of medicine in Garhwal, Indian Himalaya". *Int. J. Biodiv. Sci. Ecosyst. Serv. & Manage.* 6(1-2): 13–19.

Abstract: This study documents the medicinal uses of Astavarga, a group of eight medicinal herbs, used in traditional medical knowledge (TMK) of the Himalaya region and in the traditional medical system (TMS) in India. Field surveys were conducted during 2006–2008 to collect data on the availability and uses of Astavarga across 21 diverse localities. During the surveys, information was collected on types of ailments treated and plant parts used in different therapies in TMK using semi-structured questionnaires. Overall, information was gathered from 92 informants in the study area. These herbs are mostly used to treat sexual problems, physical disability, respiratory problems, different types of pain, fever and urinary problems, as well as antiageing agents. Information on medicinal properties of these plants was also collected from secondary sources, i.e. the traditional medical system (Ayurveda) and through a literature survey. This revealed that Astavarga in TMS is mostly used to treat sexual disorders, physical weakness, to strengthen the immune system, body pain and as a tonic. Analysis of TMK in the Himalaya reveals some new medicinal properties of Astavarga while the literature survey indicates that some of the plants, viz. *Habenaria* and *Malaxis* species, are not explored so far for their chemical constituents and biological activity. New medicinal uses, as recorded by this study, will provide insights for further investigation of pharmacology and phytochemical constituents of these species.

2476. **Dhyani, P.P., Singh, R.G. & Palni, L.M.S. 2011.** "Establishment of a sacred forest by local communities at Kolidhaik, Lohaghat in Uttarakhand". *ENVIS Newsletter Himal. Ecol.* 8: 8–10.

2477. **Dhyani, P.P., Singh, R.G., Kothyari, B.P. & Palni, L.M.S. 2011.** "Revival of Badrivan (the ancient sacred forest of Badrinath Shrine) at Badrinath: An inspirational story from the Indian Himalayan region". *ENVIS Newsletter Himal. Ecol.* 8: 5–8.

2478. **Dixit, R.S. & Pandey, H.C. 1984.** "Plants used as folk medicines in Jhansi and Lalitpur sections of Bundelkhand Uttar Pradesh". *Int. J. Crude Drug Res.* 22(1): 47–51.

Abstract: Fourteen locally available plants used by the natives of Jhansi and Lalitpur sections of Bundelkhand Uttar Pradesh as knowledge transmitted from one generation to the next are described. Local and Sanskrit names are given wherever available; also habit; part used; method of preparation and administration for treating diseases; and distribution in the Indian sub-continent.

2479. **Dobhal, K., Negi, G.S. & Badoni, P.P. 2002.** "Study of the traditional therapeutic methods of Khirsu block and Ekeshwar block of district Pauri Grhwal (Uttaranchal) (Part-I)". *Himal. Chem. & Pharmaceut. Bull.* 18-19: 36–43.

2480. **Dobhal, P., Sawan, S. & Sharma, N. 2007.** "Studies on medicinal plants of two villages of Chakrata Forest Division (Uttarakhand)". *Ann. Forest.* 15(2): 351–357.

Abstract: An ethnomedicinal survey was undertaken to collect the information about medicinal plants in two villages (Utpalta and Kwarka) of Chakrata Forest Division, Uttarakhand. Common plants with medicinal value were catalogued based on the collection during the field trips and the information was gathered through oral interviews conducted with local knowledgeable villagers of selected study area. The study revealed that a total of 29 plant species distributed in 28 genera belonging to 20 different families to treat various diseases. The documented medicinal plants were mostly used to cure various skin diseases, diabetes, dysentery, dropsy, leprosy, etc. In this study the most dominant family was Rosaceae. The study showed that many people in the studied areas still continue to depend on medicinal plants at least for the treatment of primary health care.

2481. **Dobhal, U. & Bhandari, S.L. 2006.** "Medicinal wealth of district Pauri Garhwal, Uttaranchal". *Indian J. Curr. Sci.* 9: 899–902.

2482. **Dobhal, U. & Bhandari, S.L. 2008.** "Medicinal wealth of district Pauri Garhwal". *Environm. New Challenges* 2008: 274.

2483. **Dwivedi, T., Kanta, C., Singh, L.R. & Sharma, I.P. 2019.** "A list of some important medicinal plants with their medicinal uses from Himalayan State Uttarakhand, India". *J. Med. Pl. Stud.* 7(2): 106–116.

Abstract: Himalayan range has a rich heritage of knowledge on plant based therapy. Medicinal plants play major role in the livelihood from all over the world. Uttarakhand, a Himalayan state of India also depends on the medicinal plants for medicine and traditional therapy. The people from this state use plants for their primary health care system mainly depend on traditional knowledge of medical practices and medicinal herbs. Many of the previous studies on traditional medicine as scientific outputs having traditional claims of effectiveness which are helpful to manage various ailments. In this regards many native medicinal plants listed in article are significantly utilized by the locals, which was need to document. In this scenario we try to document some medicinal plants with their medicinal properties from this state.

2484. **Farooquee, N.A. & Nautiyal, A. 1999.** "Traditional knowledge and practices of Bhotia pastoralists of Kumaon Himalaya: The need for value addition". *Int. J. Sustain. Develop. & World Ecol.* 6(1): 60–70.

Abstract: Little is known about traditional knowledge and practices developed by the transhumant societyon available plants, animal resources, medicinal herbs and other

technologies of high altitude Himalaya, where resources are scarce. Moreover, these traditional specializations ofthe indigenous people known as 'Bhotiyas' are breaking down because of lack of income generation and value addition. The impact of modernization and development has relegated the traditional systems of medicine, handicraft and cattle breeding further behind. The institutional attitude towards such knowledge systems has also been quite discouraging. This paper tries to document the traditional knowledge of some important herbs in their society, traditional cattle breeding achievements, and the traditional handicrafts, and suggests the immediate need for value addition in these sectors in order to save them from extinction and to add to the income of the people.

2485. **Farooquee, N.A., Majila, B.S. & Kala, C.P. 2004.** "Indigenous knowledge system and sustainable management of natural resources in a high altitude society in Kumaun Himalaya". *J. Human Ecol.* 16(1): 33–42.

Abstract: Considerable effort has been made to study the resource use patterns of indigenous people with a view to understanding the traditional knowledge base of different ecosystems. This study has tried to explore the linkages between the subsistence economy and utilization and conservation of natural resources in the transhumant Bhotiya society of central Himalaya. These people are also aware that the biological diversity is a crucial factor in generating the natural resources on which they depend for their survival. Hence, they have domesticated a number of wild plants and crops, and have devised their own mechanisms for indigenous cattle production. These practices of conservation of their natural resources, has ensured their survival in extreme inhospitable environmental conditions of high altitudes. But, now their indigenous knowledge and practices are on the verge of extinction, due to the integration of their society with the main stream of other societies and market economy.

2486. **Gairola, R. & Negi, G.S. 2011.** "Study of the ancient traditional therapeutic methods of Nainidanda and Bironkhal block of Pauri Garhwal (Part-I)". *Himal. Chem. & Pharmaceut. Bull.* 13: 1–6.

2487. **Gairola, S., Sharma, J., Gaur, R.D., Siddiqi, T. & Painuli, R.M. 2013.** "Plants used for the treatment of dysentery and diarrhoea by the Bhoxa community of district Dehradun, Uttarakhand, India". *J. Ethnopharmacol.* 150(3): 989–1006.

Abstract: Dysentery and diarrhoea are major causes of morbidity and mortality in rural communities of developing world. The Bhoxa community is an important primitive indigenous community of Uttarakhand, India. In this paper we have tried to scientifically enumerate ethnomedicinal plants and herbal preparations used by Bhoxa community to treat dysentery and diarrhoea, and discuss their antidiarrhoeal properties in the light of previous ethnomedicinal, pharmacological, microbiological and phytochemical studies. To record plants and herbal preparations used by Bhoxa community of district Dehradun, Uttarakhand, India in treatment of dysentery and diarrhoea, and to discuss antidiarrhoeal and antimicrobial properties of the recorded plants. Fifty medicinal plants (45 genera and 30 families) were used by Bhoxa community to treat dysentery and diarrhoea, among which 27 species were used for dysentery, 41 for diarrhoea

and 18 for both dysentery and diarrhoea. Three plants *viz.*, *Dioscorea bulbifera* L., *Euphorbia thymifolia* L. and *Prunus persica* (L.) Stokes, recorded in the present survey has been reported for the first time in treatment of dysentery and diarrhoea by any indigenous communities in India. *FL* and *UV* values revealed that most preferred species for the treatment of dysentery and diarrhoea by Bhoxa community are *Euphorbia hirta* L. followed by *Holarrhena pubescens* Wall., *Helicteres isora* L. and *Cassia fistula* L. Earlier pharmacological studies confirmed that 27 of the recorded plants have some proven antidiarrhoeal properties and remaining 23 plants have to be pharmacologically evaluated for their antidiarrhoeal properties. Except 6 plants all the other recorded plants have shown antimicrobial properties in previous microbiological studies. Previous studies have corroborated the ethnomedicinal claims made by the traditional healers of the Bhoxa community.

2488. **Gairola, Y. & Tamta, B.P. 2007.** "Diversity of medicinal climbers in Garhwal Himalayas and their economic potential". *MFP News* 17(2): 11–13.

2489. **Gairola, Y., Tamta, B.P. & Rawat, N. 2010.** "Important medicinal climbers in Garhwal Himalaya". *J. Econ. Taxon. Bot.* 34(1): 25–36.

Abstract: In Garhwal Himalayas very few studies have been accounted pertaining to medicinal properties and diverse use value of climbing plants and still there is paucity of knowledge about their distribution, abundance, ecology, conservation and management aspects. The present study, therefore, is an attempt to attract the foresters and scientists and provide a general account of distribution, medicinal uses and diverse use value of this least studied vegetation component of plant world in Garhwal Himalayan region. In general, medicinal climbing plants are distributed throughout the Garhwal Himalayan region between 325 m to 3500 m altitude and the abundance and diversity decline gradually as we move towards higher altitudes. A total 70 wild climbing plants were recorded and studied during the course of study for their medicinal properties nd diverse use value, viz., housing and construction, edible and beverages, fibres, fodder, aphrodisiac, socio religious and ornamental value etc. During the study, consideration was focused only to those climbing plants which occur naturally in forest areas rather than the cultivated ones.

2490. **Gangwar, K.K., Deepali & Gangwar, R.S. 2010.** "Ethnomedicinal plant diversity in Kumaun Himalaya of Uttarakhand, India". *Nature & Sci.* 8(5): 66–78.

Abstract: Kumaun Himalaya of Uttarakhand State is characterized by a rich diversity of ethnomedicinal plants as well as a rich heritage of traditional medicine system. The present study reveals the status of ethno-medicinal flora and their importance preserved by the local population in Kumaun region. During the study it was observed that 102 species of ethno-medicinal plants belonging to 48 families are being used in the folk-medicine system by the indigenous people of this region. For the present study, an intensive and extensive survey was made for four selected districts of Uttarakhand, viz. Almora, Champawat, Bageshwar and Pithoragarh. The neighboring villages of the study areas were also visited for identification of plant species and to explore the traditional knowledge about the use of indigenous medicinal plants. Therefore, the ethnobiological knowledge of people and listing of plants of particular

region are important tools that may help in understanding human environment interactions.

2491. **Gangwar, R.S., Joshi, B.D., Joshi, R. & Singh, R. 2009.** "Medicinal and economic plants of Darma valley consumed by Bhotias: A case study from Kumaun Himalaya, India". *J. Econ. Taxon. Bot.* 33(1): 67–72.

Abstract: The Darma valley has its own importance and secfic characteristics with respect to plants diversity. The valley presents subtropical to alpine scenario with attendant vegetation and floristic composition and has a number of plants of economic and medicinal value. This valley is inhabited by Bhotia-Rung tribe, who has been livestock reared and traders. Present investigation was carried out to assess medicinal and economical values of plants consumed by Botias (tribal community) along river Dhauli Ganga in Darma valley, Kumaun Himalaya of Uttarakhand state of India. During the course of the study, a total number of 80 species of plants belonging to 46 families and 70 genera were identified. Out of 80 plant species, 23 species for medicine, 20 species for vegetable and subsidiary food, 6 species for condiment and pickle, 6 species for essence and 25 species for miscellaneous purposes were found to be consumed by Bhotia community of Darma valley.

2492. **Garbyal, S.S., Aggarwal, K.K. & Babu, C.R. 2005.** "Traditionally used medicinal plants in Dharchula Himalayas of Pithoragarh district, Uttaranchal". *Indian J. Tradit. Knowl.* 4(2): 199–207.

Abstract: An attempt has been made to evaluate the traditionally used medicinal plants found in Dharchula areas of Kumaon Himalayas in Pithoragarh district, Uttaranchal, North India. The reported plant species are also highly valued in the Indian, Tibetan and Chinese Systems of Medicine. Based on interactions with the locals and traders and considering the potentials of some species for developing new drugs, the value of the species of medicinal importance occurring in the area has been worked out. The value is high enough for taking appropriate measures to conserve these valuable species and use them sustainable for the economic upliftment of the region.

2493. **Garbyal, S.S., Grover, A., Aggarwal, K.K. & Babu, C.R. 2007.** "Traditional phytomedicinal knowledge of Bhotias of Dharchula in Pithoragarh". *Indian J. Tradit. Knowl.* 6(2): 360–364.

Abstract: Bhotias of Dharchula sub-division in Kumaon, Uttaranchal in North India have been living in isolation for centuries. They have had strong bond with the nature. They have traditionally been dependent on nature for healthcare, as they did not have access to the modern medicinal facilites until about 1960s. No serious attempts were made to document the traditional phytomedicines used by Bhotias of Dharchula areas in the past. Present attempt is the ethnomedicinal survey to document the traditional phytomedicines used by them.

2494. **Garg, A. 2016a.** "Ethnomedicinal plants used for their roots in the Nawabgunj Bird Sanctuary, Uttar Pradesh, India". *J. Non-Timber Forest Prod.* 23(2): 111–115.

Abstract: Floristic and ethnobotanical exploration of Nawabgunj Bird Sanctuary revealed that the roots of 25 species of plants under 25 genera and 19 families,

were utilized by the local people dwelling in nearby villages of this area for ethno medicinal purposes.

2495. **Garg, A. 2016b.** "Toxic plants of the Nawabganj Bird Sanctuary, Uttar Pradesh". *J. Non-Timber Forest Prod.* 23(4): 235–238.

Abstract: Floristic studies of the Nawabgunj Bird Sanctuary in Uttar Pradesh revealed the occurrence of 12 toxic plants within the Sanctuary with either leaves, seeds, latex, bark and/or whole plants having toxic properties. Clearance of these from the Sanctuary is recommended for maintenance of a healthy ecosystem within.

2496. **Garg, A. 2017.** "Ambikeshwar Sacred Site in Upper Ganga– A repository of primeval flora and cultural wealth". *J. Non-Timber Forest Prod.* 24(1): 43–46.

Abstract: Floristic surveys of Upper Ganga Ramsar Site in Uttar Pradesh, revealed existence of pristine floristic constituents and a primeval 'Gurukul' conserved as heritage relics of India, within the precincts of Ambikeshwar sacred site. The site also served as a reservoir of rich biomass and a magnificent carbon sink, a potential study site for palaeobotanists.

2497. **Garg, A. & Singh, V.K. 2013a.** "Mandu Sacred grove in Upper Ganga Ramsar Site, Uttar Pradesh". *Curr. Sci.* 104 (4): 409–410.

2498. **Garg, A. & Singh, V.K. 2013b.** "Siddhwari Sacred grove in Upper Ganga Ramsar site, Uttar Pradesh". *Curr. Sci.* 105(8): 1039–1040.

2499. **Garg, A., Singh, V.K. & Singh, R.K. 2014.** "Economically valuable wild plant resources of Nawabgunj Bird Sanctuary, Uttar Pradesh". *J. Non-Timber Forest Prod.* 21(2): 99–104.

Abstract: Economically valuable wild plant resources of the Nawabgunj Bird Sanctuary belonging to 85 taxa are listed along with their multifarious utility. The studies illuminated the worth of these plants in daily life sustenance of the local inhabitants dwelling near the Sanctuary as well as their potential large scale value in pharmaceutical industry.

2500. **Gaur, R.D. 1977.** "Wild edible fruits of Garhwal hills". *The Himalaya* 1: 66–70.

2501. **Gaur, R.D. 1993.** "Some little known uses of plants from Uttar Pradesh Himalaya". *Acta Bot. Ind.* 21(1): 160–161.

2502. **Gaur, R.D. 2008.** "Traditional dye yielding plants of Uttarakhand". *Nat. Prod. Radiance* 7(2): 154–165.

Abstract: The present paper is based on extensive survey, collection of ethnobotanical information and review of relevant literature on the vegetable dye yielding resources of Uttarakhand Himalaya. The study reports 106 dye yielding plants (belonging to 63 families), along with their vernacular names, habit, part(s) used, nature of dye and distribution. It also describes preparation of dyeing stuffs, use of mordants and specific dye utilization to serve various purposes, including several of the new dye resources.

2503. **Gaur, R.D. & Nautiyal, S. 1993.** A survey of fiber-yielding plants of Garhwal Himalaya. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest., Addl. Ser.]* 2: 193–208. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: The present communication pertains to the survey of fibre yielding plants, chiefly based on folk utilization in different localities of the Grahwal Himalaya.

2504. **Gaur, R.D. & Semwal, J.K. 1983.** "Some little known wild edibles of Garhwal Himalaya". *Man* & *Environm.* 7: 161–165.

2505. **Gaur, R.D. & Sharma, J. 2011.** "Indigenous knowledge on the utilization of medicinal plant diversity in the Siwalik region of Garhwal Himalaya, Uttarakhand". *J. Forest. Sci.* 27(1): 23–31.

Abstract: Ever since the dawn of civilization, the ambient vegetation and the resources constituted major source of human existence for various substantial requirements. Our present knowledge on plant resources emerged from the traditional heritable knowledge descended from generation to generation. However, traditional knowledge pertaining to several aspects remained untapped from various remote localities or populations. Furthermore, with the present trends of excessive exploitation of natural resources and degradation of habitats, conservation and ecological management require coherence of traditional skills and modern approaches. Therefore, the present study is to record traditional plant based knowledge among the inhabitants of Siwalik region of Uttarakhand Himalaya. Extensive field survey was made for the collection of data on the medicinal aspects of plant species in the study area covering the parts of districts Pauri, Dehradun and Haridwar. During the course of study 130 plant species belonging to 65 families are reported, used as traditional medicine by the local inhabitants of this region.

2506. **Gaur, R.D. & Tiwari, J.K. 1987.** Indigenous medicinal plants of Garhwal Himalaya: An ethnobotanical study. In: Leeuwenberg, M.S. (Ed.), *Medicinal and Poisonous Plants of Tropics*. Berlin, Pp. 139–142.

2507. **Gaur, R.D., Bhatt, K.C. & Tiwari, J.K. 1992.** "An ethnobotanical study of Uttar Pradesh Himalaya in relation to veterinary medicines". *J. Indian Bot. Soc.* 72: 139–144.

Abstract: The present communication deals with the utilization of plants in relation to the veterinary medicines by different hill populace inhabiting the remote localities of Uttar Pradesh Himalaya. Extensive ethnobotanical explorations in several remote areas of Garhwal and Kumaon regions during the years 1984-1991, accumulated some interesting as well as little known information on 60 plant species used to relieve various ailments of domestic animals.

2508. **Gaur, R.D., Bisht, M.K. & Bhatt, K.C. 1990.** Usage of plants in the local beverage (Soor) by Jaunsaris of U.P. Himalaya. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.,* Addl. Ser.] 1: 275–280. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: The present paper pertains to the ethnobotanical aspects of the local beverage 'soor' commonly used by one of the primitive hill communities, Jaunsaris of Jaunsar-Bawar in Dehra Dun district of Uttar Pradesh.

2509. **Gaur, R.D., Purohit, Y.P. & Silas, S.A. 1986.** "*Euonymus tingens* Wall. (Celastraceae)– A tree of multi-economic folk utility in Raath region (Garhwal Himalaya)". *Bull. Bot. Surv. India* 28(1-4): 146–148.

Abstract: *Euonymus tingens* Wall., a temperate arborescent plant species collected from Raath region (Dudhatoli area) of Garhwal Himalaya (U.P.), is observed to be closely associated with the folk culture, traditions and the daily life of the inhabitants of this area. The ethnobotanical importance, obtained from the natives and the medical practitioners represented its multipurpose economic uses in medicine, psychomedicines, dye, timber, fodder, fuel and in folk songs etc. Hence, this tree of multieconomic value, needs to be protected and conserved. The present paper incorporates its distribution in area, brief description with figures of some parts and various folk utility.

2510. **Gaur, R.D., Semwal, J.K. & Negi, K.S. 1983.** "Traditional fodder yielding plants of Garhwal Himalaya and their impact on quality and quantity of milk". *J. Himal. Stud. Reg. Develop.* (*JOSHRAD*) 6: 89–93.

2511. **Gaur, R.D., Semwal, J.K. & Tewari, J.K. 1983.** "A survey of high altitude medicinal plants of Garhwal Himalaya". *Bull. Med.-Ethno-Bot. Res.* 4: 102–116.

2512. **Gaur, R.D., Sharma, J. & Painuli, R.M. 2010.** "Plants used in traditional healthcare of livestock by Gujjar community of Sub-Himalayan tracts, Uttarakhand, India". *Indian J. Nat. Prod. & Resources* 1(2): 243–248.

Abstract: The present paper highlights the indigenous knowledge on the ethnoveterinary medicinal plants used by the *Gujjar* community of Sub-Himalayan tracts in Garhwal Himalaya. This tribe is a nomadic one, lives with their livestock's in the forests, roaming from one place to other in different habitats. Their herds of livestock constituted a substantive role, as their economy is totally dependent on selling milk and other dairy products. They are dependent on the surrounding vegetational wealth for the treatment of various ailments of their livestock, following traditionally based knowledge system. They also have distinct folk concepts regarding the diagnosis of cattle ailments. The following study includes 54 plant species belonging to 32 families, commonly employed in ethnoveterinary practices by the community.

2513. **Gaur, R.D., Sharma, J. & Painuli, R.M. 2011.** "Folk herbal medicines used by the Gujjar tribe of sub-Himalayan tracts, Uttarakhand". *J. Econ. Taxon. Bot.* 35(1): 224–230.

Abstract: The present paper represents the indigenous knowledge on the utilization of various plant species as herbal medicines among nomadic tribe Gujjar of sub-Himalayan tract of Uttarakhand. The Gujjars inhabit in the forest of Himalaya with their livestock, hence, called as Van-Gujjars. They are completely dependent on the surrounding vegetational wealth for various substantive requirements including treatment of different ailments through their inherital traditional knowledge. The following study is based on extensive field surveys, interviews with the community, particularly the elder traditional tractitioners and women folk. In the following text ethnomedicinal information on 46 plant species, belonging to 25 families used by this tribe of sub-Himalayan tracts has been included.

2514. **Gaur, R.D., Sharma, M.P. & Semwal, J.K. 1980.** "Ethnotoxic plants of Garhwal hills". *The Eastern Anthropologist* 33: 159–163.

2515. **Ghildiyal, J.C. & Juyal, P. 2014.** "Indigenous uses of plants in skin diseases by local inhabitants of Bhabar tract of Garhwal Himalaya". *J. Pharmaceut. Biol.* 4(1): 16–19.

2516. **Ghildiyal, J.C., Juyal, P. & Sadana, G. 2010.** "Folk-medicinal uses of plants as antidote by local people in bhabar region of Uttarakhand". *J. Non-Timber Forest Prod.* 17(3): 361–364.

Abstract: The present paper includes ethnobotanical notes on 47 species of medicinal plants, which are used by local people as antidote or pain reliever against the poisonous sting or bite of creatures as reptiles, insects and animals.

2517. **Ghildiyal, J.C., Juyal, P. & Sadana, G. 2014.** "Indigenous uses of plants in different women ailments in Garhwal region". *Indian J. Pharmaceut. & Biol. Res.* 2(1): 39–44.

Abstract: A survey of villages of Garhwal region was done to identify medicinally important plants used by local peoples of that region against different women ailments. Paper deals with 67 plant species of 42 families as an herbal medicines described by local peoples used for different women ailments i.e., leucorrhoea, menstrual disorders, menorrhagia, poor lactation, uterus infection, abortion, deliverythe samples.

2518. **Ghildiyal, J.C., Juyal, P. & Sadana, G. 2015a.** "Ethno-medicinal uses of the plants by Gonds Tribes of Kotdwara in the foothills of Garhwal Himalaya". *Int. J. Pharmacy & Nat. Med.* 3(1): 226–229.

Abstract: The tribal people living in the remote areas have special knowledge of plants. Therefore it is required to record and documentation of their knowledge before it's lost forever. The present paper deals with ethno-medicinal uses of plant species in 26 different types of diseases by the local tribes of Gonds in the foothills of Garhwal Himalayas. The plants have been identified with their local name, botanical name and family.

2519. **Ghildiyal, J.C., Juyal, P. & Sadana, G. 2015b.** "Indigenous uses of plants by Gariya Lohars in Bhabar region of Garhwal Himalaya". *J. Med. Pl. Stud.* 3(2): 108–110.

Abstract: The paper deals with medicinal uses of 25 plant species used by Gariya lohars in different human ailments in Bhabar region of Garhwal Himalaya.

2520. **Goel, A.K. & Bhattacharyya, U.C. 1981.** "A note on some plants found effective in treatment of Jaundice (Hepatitis)". *J. Econ. Taxon. Bot.* 2: 157–159.

Abstract: A crude drug combination of the seeds of five plants is being reported for the treatment of jaundice with their identity, morphological characters and distribution in India.

2521. **Gupta, R.K. 1960.** Some useful and medicinal plants of Garhwal Himalaya: An Ethnobotanical study. In: Leewenberg (Ed.), *Medicinal and Poisonous Plants of Tropics.* Netherland. Pp. 139–142.

2522. **Gupta, R.K. 1962.** "Some useful and interesting food plants of the Garhwal Himalaya". *J. D'Agric. Tropic. Bot. Appl.* 9(11-12): 532–535.

Abstract: In the present paper some interesting and unusual food plants used by the local inhabitants have been given. Recently Bhargava (1960) gave some notes on these plants but his list is incomplete. These plants are interesting, since the date add

variety to the monotonous diet of these people and publicise the hitherto little known resources to many visitors, naturalists and expeditionists who can make use of them during their tours in regions where other food stuffs are not available. Cultivated food produts that are used belong to the families Gramineae, Leguminosae and Cucurbitaceae. Besides the cultivated products, a number of wild species are used as food plants. Sometimes they are of a great significance during the times of famine and scarcity.

2523. **Gupta, R.K. 1966.** "*Orchis latifolia* Linn.– A little known economic plant of North-western Himalayas". *Indian Forester* 92(11): 701–703.

Abstract: Tuberous roots of *Orchis latifolia* Linn. yield 'salep' used extensively in Unani and Ayurvedic prescriptions both as tonic and medicine. Recent market survey revealed a heavy import of these tubers in India valued at several millions of rupees. Steps necessary to develop the indigenous resources are discussed in this paper alongwith method of collection, drying and marketing.

2524. **Gupta, R.K. 1981.** Plants in folk medicines of the Himalaya. In: Jain, S.K. (Ed.), *Glimpses of Indian Ethnobotany.* New Delhi. Pp. 83–90.

2525. **Gusain, Y.S. & Khanduri, V.P. 2016.** "*Myrica esculenta* wild edible fruit of Indian Himalaya: Need a sustainable approach for indigenous utilization". *Ecol. Environm. & Conserv.* 22: 267–270.

Abstract: *Myrica esculenta* Buch.-Ham. ex D. Don is a popular, potentially income-generating wild edible tree species in the Indian Himalaya. Almost all the part of the tree has medicinal properties. The fruit is eaten as raw and can be used for the production of several kind of by product. Due to overexploitation by the endogenous people for their daily need and commercial income generating value, the species is poorly regenerating in their natural habitat and pose a threat for extinction. The effective scientific technology for the rapid multiplication and propagation of species are still poor. Therefore it is a need of serious scientific intervention for their multiplication, establishment in natural habitat and need of an approach for sustainable utilization by endogenous people.

2526. **Husain, T., Singh, H., Pande, P.C., Paliwal, A.K. & Agnihotri, P. 2010.** Role of sacred groves in biodiversity conservation– A case study from Haat Kali sacred grove, Pithoragarh (Uttarakhand). In: Singh, M.P. & Paliwal, A.K. (Eds.), *Advancement in Science and Technology.* Jagdamba Publishing Co. New Delhi. Pp. 85–89.

2527. **Husain, W. & Siddiqui, B. 1987.** "Ethnobotanical approach of North-Western U.P.". *Acta Bot.* 15: 94–97.

2528. **Issar, R.K. 1981.** "Traditionally important medicinal plants and folklore of Uttarakhand Himalayas for animal treatment". *J. Sci. Res. Pl. Med.* 2(3): 61–66.

2529. **Jagwan, S.S., Singh, N. & Zargar, K.A. 2011.** "Medicinal plant of Kedar valley, Garhwal Himalaya (Uttarakhand)". *J. Non-Timber Forest Prod.* 18(3): 245–252.

Abstract: The article attempts to highlight the issue of medicinal Plant, especially in the Garhwal Himalayas, Uttarakhand with their botanical names, life form, distribution, habitat, part used, other useses and current status. The medicinal uses of 94 plants

species have been presented. The results reported here are the outcome of extensive study of the literature on Garhwal flora, its uses and future benefits. Information has also been gathered from local people by an ethnobotanical survey in Kedar valley villages like Triyuginarayan, Guptkashi, Phata Rampur, district Rudraprayag, region of Garhwal Himalaya, Uttarakhand.

2530. **Jagwan, S.S., Singh, N., Zargar, K.A. & Sharma, A. 2010.** "Value addition for future prospects of small scale enterprise development and nutritional value of some lesser known wild edibles of Garhwal Himalaya, Uttarakhand". *J. Non-Timber Forest Prod.* 17(3): 295–304.

Abstract: The present study highlights some important lesser known wild edibles which have been traditionally used by indigenous people of Garhwal Himalaya, Uttarakhand but they have been neglected by research institutions, policy planners and food and medicine processing industries.

2531. **Jain, S.K. & Saklani, A. 1991.** "Observation on the ethnobotany of the Tons valley region in the Uttarkashi district of the North West Himalaya, India". *Mount. Res. & Develop.* 11(2): 157–161.

Abstract: Thirty two medicinal plants used by the local people in the Tons valley has been collected in the present paper by junior author (AS) who had personal contact with the inhabitatnts and practitioners, mostly with the people who live around Har-ki-dun, Jakhol, and the surrounding villages at altitudes between 2250-3400 m.

2532. **Jain, S.K., Sinha, B.K. & Saklani, A. 1989.** "Some interesting medicinal plants known among several tribal societies of India". *Ethnobotany* 1: 89–100.

Abstract: During the last 25 years, over 300 papers have been published on ethnobotany of India. A scrutiny of these and our own field work in several parts of India has brought on record less-known ethnomedicinal uses of about 600 plants. Whereas much of this folk knowledge is endemic to a particular tribe or region, several uses are known to many ethnic groups. *Argemone Mexicana* for rheumatism in Rajasthan, syphilis and pyorrhoea in Gujarat, and piles in Maharashtra; *Calotropis gigantea* for leprosy in U.P. and Orissa, epilepsy in Bihar, guineaworm in Maharashtra and ringworm in Assam and Maharashtra; and many species in the genera *Archillea, Achyranthes, Alcea, Barringtonia, Cissampelos, Clerodendron, Datura, Flacourtia, Hedyotis, Holarrhena*, etc. Pluralistic use in several societies, as well as for different diseases, lends more credibility to ethnomedicinal claims.

2533. **Jain, S.P. & Puri, H.P. 1984.** "Ethnomedicinal plants of Jaunsar-Bawar hills, Uttar Pradesh, India". *J. Ethnopharmacol.* 12: 213–222.

Abstract: During an ethnomedicobotanical survey of Jaunsar-Bawar, a hilly tribal inhabited area in Uttar Pradesh, India, it was observed that about 100 plants are being used by the local Jaunsari tribe for the treatment of various ailments. An alphabetical list of these plants is given along with their family, local name, local uses, locality and collection number.

2534. **Jain, S.P. & Puri, H.P. 1990.** "Herbal ingradients of a Himalayan starter– Keem". *J. Econ. Taxon. Bot.* 14(1): 153–155.

Abstract: In the Jaunsar-Bawar area of the Uttar Pradesh Himalayas of India, an alcoholic beverage is commonly prepared by utilizing about 50 local plants. The botanical and local names of the plants used have been ascertained.

2535. **Jain, S.P., Chitranshi, T., Reddy, Y.V. & Bisht, S.A. 2003.** An ethno-medicinal plant survey of Bageshwar district of Uttaranchal state. In: Janarthanam, M. & Narasimhan, D. (Eds.), *Plant Diversity, Human Welfare and Conservation*. Goa University, Pp. 219–226.

2536. **Jalal, J.S. & Garkoti, S.C. 2013.** "Medicinal plants used in the cure of stomach disorders in Kumaon Himalaya, Uttarakhand, India". *Acad. J. Med. Pl.* 1(7): 116–121.

Abstract: The present study documents some of the medicinal plants which are being used by the local communities in Kumaon Himalaya for the cure of stomach disorders. The identification validation and documentation of the plant material from the region revealed that 41 plants belonging to 26 families were used for digestive disorders in which 16 were trees, 7 shrubs, 17 herbs and 1 climber. These plants are being used for the cure of various stomach disorders such as diarrhea, dysentery, stomachache, blood dysentery and also to dispel worms.

2537. **Jalal, J.S., Kumar, P. & Pangtey, Y.P.S. 2008.** "Ethnomedicinal orchids of Uttarakhand, Western Himalaya". *Ethnobot. Leafl.* 12: 1227–1230.

Abstract: Orchids have been used in the traditional system of medicine since time immemorial. The present communication is an account of 12 species of orchids which are used in traditional medicine in Uttarakhand. The work aims at presentation of this knowledge which would be valuable for the herbal drug industry and may lead to identification of new applications or resources. Given in this paper are the scientific names of the plants, local names and the parts of the plant used in medicinal preparations.

2538. **Jalal, M. & Nautiyal, D. 2015.** "Medicinal and other potential use of wild flora found in Kumaun area". *Researcher* 7(4): 114–122.

2539. **Jaryal, R.K. & Singhal, V.K. 2019.** "Traditional knowledge and conservation status of some selected medicinal herbs from Uttarkashi district in Uttarakhand, Western Himalayas". *Taiwania* 64(1): 52–64.

Abstract: Traditional knowledge has been used throughout the world including India as a practice of using local herbal drugs. Majority of the locals living in the district Uttarkashi of Uttarakhand state have poor connectivity and socio-economic status. These people are known to have indigenous experience about the medicinal plants of the area and use their age-old experiences and perceptions in the treatment and prevention of various ailments. Present paper documents the ethnobotanical information and conservation status of 82 medicinal herbs from the hilly district of Uttarakhand. Information gathered include, local name, plant parts used, mode of preparations, medium of administration, ailments cured along with distribution and conservation status. Majority of these plants were used for their roots and leaves. Most of them are herbs while trees and climbers were less frequently used. People living in remote areas have a vast treasure of knowledge, but they do not disclose it easily to outsiders. During surveys and interactions, it has been noticed that due to

over exploitation, some medicinal herbs are at the verge of extinction which need to be conserved at the earliest.

2540. **Joshi, B. & Tyagi, V. 2011.** "Traditional knowledge and utilization of medicinal plants of Himalayan region". *Nature & Sci.* 9(5): 1–6.

2541. **Joshi, C.P. & Singh, B.B. 2006.** "Indigenous agricultural knowledge in Kumaon hills of Uttaranchal". *Indian J. Tradit. Knowl.* 5(1): 19–24.

Abstract: Application of high inputs in agriculture, in terms of chemical fertilizers and pesticides has endangered the sustainability of production system. Indigenous knowledge of agriculture, is the result of farmers' thousands years of experience with nature. Indigenous practices are known to the farmers and are helpful in maintaining and enhancing the quality of the environment. With the dissemination of modern practices the indigenous practices have started to loose their ground and have been eroded to a large extent. In the hills of the Uttaranchal, farmers still practice farming by following indigenous practices. The study identifies indigenous agricultural knowledge (IAK) of the farmers regarding various aspects of crop production.

2542. **Joshi, D.N., Shah, B.C.L. & Suri, R.K. 1982.** "Some medicinal plants of Rudranath bugyal (district Chamoli), U.P.". *Bull. Med.-Ethno-Bot. Res.* 3(1): 27–42.

2543. **Joshi, G.C. 1993b.** "*Podophyllum hexandrum* Royle: Herbal drug - A ray of hope for cancer medicine". *Sachitra Ayurved* (July): 55–56.

2544. **Joshi, G.C. & Pande, P.C. 2000.** Ethnobotany of Tarikhet block of Kumaun Himalaya. In: Agrawal, C.M. (Ed.), *'Shikhar' Salutation to the Himalaya*. Indian Publishers & Distributors, New Delhi. Pp. 209–228.

2545. **Joshi, G.C. & Tewari, K.C. 2000.** "Wild edible plant diversity in Uttar Pradesh Himalaya". *J. Econ. Taxon. Bot.* 24(2): 433–443.

Abstract: The paper gives an account of 108 wild edible plants found in Himalayan ranges in Uttar Pradesh at different altitudes. Botanical name, family, common names in Garhwal and kumaun, flowering and fruiting time, habit and the parts of the plant which are edible are given.

2546. **Joshi, G.C. & Uniyal, M.R. 1991.** "Folk-medicinal importance of 'Udsaleeb', *Paeonia emodi* Wall. and its cultivation strategy from western Himalaya". *Sachitra Ayurved* 44(2): 124–125.

2547. **Joshi, G.C., Pandey, N.K., Mudaiya, R.K. & Tiwari, K.C. 1996-1997.** "Botanical identification of new folk medicine for snake bite from Kumaun Himalaya". *Aryavaidyan* 10(2): 114–115.

2548. **Joshi, G.C., Tiwari, K.C. & Pandey, G. 1992.** "A review of indigenous system of medicine with special reference to herbal drugs". *Aryavaidyan* 3(3): 173–179.

2549. **Joshi, G.C., Tewari, V.P. & Tiwari, K.C. 1995.** "*Taxus buccata* L. (Himalayan Yew): An emerging anticancer plant drug". *Sachitra Ayurveda* (February): 611–612.

2550. **Joshi, G.C., Tiwari, K.C., Pande, V.N. & Pandey, G. 1997.** "Ethno-medico-botanical studies on the fungi of Kumaun Himalaya (U.P.)". *Bull. Med.-Ethno-Bot. Res.* 18(1-2): 30–34.

2551. **Joshi, G.C., Tiwari, K.C., Pandey, N.K. & Pandey, G. 1994.** "*Dioscorea kumaonensis* Kunth: A new source of anti-rheumatic drug from Kumaun Himalaya and its conservation strategy. *Sachitra Ayurveda* (March): 198–199.

2552. **Joshi, G.C., Tiwari, K.C., Tiwari, R.N. & Pandey, N.K. 2001.** Ayurvedic medicinal plants of UP Himalaya: Status and conservation. In: Samant, S.S., Dhar, U. & Palni, L.M.S. (Eds.), *Himalayan Medicinal Plants: Potential and Prospects*. Gyanodaya Prakashan, Nainital. Pp. 125–151.

2553. **Joshi, G.C., Tiwari, K.C., Tewari, R.N., Pandey, N.K. & Pandey, G. 1993.** Resource survey of the pharmaceutically important plants of Uttar Pradesh Himalaya. In: Dhar, U. (Ed.) *Himalayan Biodiversity Conservation Strategies*. G.B. Pant Institute of Himalayan Environment & Development, Almora. Pp. 279–292.

2554. **Joshi, H.C., Arya, S.C. & Samant, S.S. 1999.** "Diversity, distribution and indigenous uses of medicinal and edible plants in a part of Nanda Devi Biosphere Reserve I". *Himal. Biosphere Reserve* 1: 49–65.

2555. **Joshi, H.C., Arya, S.C. & Samant, S.S. 2001.** "Diversity, distribution and indigenous uses of plant species in Pindari area of Nanda Devi Biosphere Reserve– II". *Indian J. Forest.* 24(4): 514–536.

Abstract: Human dependence on the plant resources of the protected areas of the Indian Himalaya ahs been poorly attempted. Therefore, the present attempt has been made in a part of Nanda Devi Biosphere Reserve and reports 224 species belonging to 129 genera and 75 families. These species are distributed within different life forms i.e. trees (37 spp.), shrubs (30 spp.) and herbs (157 spp.). These species have been analysed for species diversity, distribution and utilization patterns, nativity, endemism, rarity and indigenous uses. 145 species are native to Himalayan region, 4 species are endemic and 47 species are near endemic. Maximum species (171) are distributed in the zone 2100-2800 m. 146 species are used for the treatment of various ailments, 94 species as food (edible), 46 species are fodder, 35 species as fuel, 12 species as religious, 11 species in making agricultural tools, 5 species for house building and 6 species of various purposes. Due to over-exploitation and habitat degradation *Acer caesium, Picrorhiza kurrooa, Nardostachys grandiflora* and *Dioscorea deltoidea* (all vulnerable) have been listed in Red Data Book of Indian Plants. These species along with others have been categorised as Critically Rare (13 spp.), Endangered (6 spp.), Vulnerable (7 spp.), and Low Risk near Threatened (1 sp.). Population assessment and extraction trends of these resources and conservation and management of priority species have been envisaged.

2556. **Joshi, M.C. 1985.** "Plants popular in Kumaun folk songs". *Bull. Med.-Ethno-Bot. Res.* 6(1): 67–71.

2557. **Joshi, N. & Kumar, N. 2000.** *Aromatic and Medicinal Plants of Central Himalaya. Tech. Bull.* No.11. Defence Agricultural Research Laboratory, Pithoragarh.

2558. **Joshi, P. 1993.** *Ethnobotany of Tribal Communities of Kumaon Himalaya.* Ph. D. Thesis, Kumaun University, Nainital. (Unpublished).

2559. **Joshi, P. 1997.** "Ethnobotany of pteridophytes of hilly districts of Uttar Pradesh, India". *Indian Fern J.* 14: 14–18.

Abstract: A review of ethnobotany of pteridophytes of hilly districts of Uttar Pradesh is presented. About 44 ferns and fern-allies are used by the local inhabitants of the region viz.-a-viz. medicine (9), food (16), ornamental (21), beverage (1), magico-religious belief (2) and miscellaneous (8).

2560. **Joshi, P. & Pande, P.C. 1995.** Ethnobotany of the Rajis of Kumaon Himalaya: A preliminary study. In: Joshi, M.P. & Joshi, L.P. (Eds.), *Uttaranchal Himalaya*. Shree Almora Book Depot, Almora. Pp. 241–263.

2561. **Joshi, P. & Pande, P.C. 1997.** Ethnobotany of Bhotia tribe of Kumaun Himalaya. In: Sharma, S.K. & Dhoundiyal, N.C. (Eds.), *Studies on Kumaun Himalaya*. Indus Publishing Company, New Delhi. Pp. 63–89.

2562. **Joshi, V. 2006.** "An ethnomedicinal note on the plant *Stephania glabra* (Roxb.) Miers. from Uttaranchal hills". *J. Econ. Taxon. Bot.* 30(Suppl.): 13.

Abstract: Tubers of *Stephania glabra* (Roxb.) Miers. are reported to have tanrik medicinal use in Uttaranchal.

2563. **Joshi, V. & Joshi, S.P. 2011.** "Wild vegetable species commonly consumed by tribes of Chakrata". *Indian Forester* 137(11): 1338–1341.

Abstract: The Chakrata Forest Division is in Dehradun district. The locals of Chakrata are tribal and popularly known as 'Jaunsaris'. These people live in the small gathering near the forest and still depend on natural resources for teir day to day need. A total of 17 plant species are recorded from the wilderness that are consumed by locals by directly collecting from the forests. Species like *Diplezium* has become so popular that it is routinely collected from the wild and sold in the nearby market. There are many other species which are used as vegetables, and few are used as spices and condiments. These include herbs, shrubs, trees and ferns. Parts of the plants are used as vegetables include stem, twigs, leaves, etc.

2564. **Joshi, V. & Pandey, A. 2007.** "A less known plant (*Stephania glabra* Meirs.) of medicinal importance from Garhwal hills of Uttarakhand". *Ann. Forest.* 15(1): 157–158.

Abstract: A less known medicinal plants viz., *Stephania glabra* Meirs. (Menispermaceae) has been collected first time from the river banks of Alkananda in the Rudraprayag range of Pauri Garhwal hills of Uttarakhand, previously reported from Assam, the Himalayas and the Western Ghats upto Nilgiris.

2565. **Juyal, P. & Ghildiyal, J.C. 2013a.** "Plants used by the local inhabitant of Bhabar tract for hair related problems". *Int. J. Pharmaceut. & Med. Res.* 1(2): 70–72.

Abstract: Hair related problems are really an important issue any one can face in life. In today's life hair related problems are very common due to many reasons like illness, tension, hormone imbalance, polluted water and air, hereditary, use of chemicals on hair, etc. Hair comes in many different lengths, colors, and textures. It is normal to shed some hair each day as it is natural. However, some people may experience excessive hair loss i.e. more than normal. It create problem of hair loss and baldness. The paper deals with 30 plant species used for hair related problems i.e. baldness, dandruff, lice, as a hair tonic, for making hair black etc. by the local inhabitants of Bhabar tract.

2566. **Juyal, P. & Ghildiyal, J.C. 2013b.** "Indigenous uses of plants to induced fertility and anti-fertility in Garhwal region, India". *J. Ethnobiol. & Tradit. Med.* 120: 629–632.

Abstract: The aim of the present study is to find out herbs which are helpful to induce fertility and antifertility in human beings. A survey of villages of Garhwal region was done to identify medicinally important plants used by local peoples of that region to induce fertility and antifertility. Paper deals with 18 herbal medicines described by local peoples used to induce fertility and 8 herbal medicines used to induce antifertility.

2567. **Juyal, P. & Ghildiyal, J.C. 2013c.** "Indigenous animal health care practices from Garhwal Himalaya". *J. Med. Pl. Stud.* 1(4): 148–151.

Abstract: This communication carries valuable information on 31 species of ethno-veterinary plants, commonly used for the treatment of domestic animals by local people of Bhabar region.

2568 **Juyal, P. & Ghildiyal, J.C. 2013d.** "Medicinal phyto-diversity of Bhabar tract of Garhwal Himalaya". *J. Med. Pl. Stud.* 1(6): 43–57.

Abstract: A survey of villages of Bhabar tract of Garhwal region was done to identify medicinally important plants used by local peoples of that region. The paper deals with 393 plant species described by local peoples including- Boxas, Gujjars, Ayurvedic practitioners, herbal vendors, Vaidyas used for different diseases. The study was conducted between 2006 to 2008.

2569. **Juyal, P. & Ghildiyal, J.C. 2014a.** "Indigenous herbal remedies for diabetes mellitus in Bhabar region of Garhwal". *Int. J. Pharmacy & Nat. Med.* 2(1): 131–133.

Abstract: This paper deals with 18 indigenous medicinal plants for the treatment and control of diabetes among the villages of Bhabar tract. The botanical name, vernacular name, family, plant parts used and mode of application are provided.

2570. **Juyal, P. & Ghildiyal, J.C. 2014b.** "Traditional and medicinal importance of *Ocimum tenuiflorum* in Bhabar region of Uttarakhand". *J. Functional & Environm. Bot.* 4(1): 33–36.

Abstract: *Ocimum tenuiflorum* commonly known as tulsi in Hindi and basil in English is widely distributed in Garhwal region. It shares a very important relation with man regarding the sacred religious beliefs, traditional and medicinal uses of the plant. Drugs are obtained from all parts of the plant. Here, present study described uses of Tulsi in different diseases.

2571. **Juyal, S.P. & Uniyal, M.R. 1960.** "Medicinal plants of commercial and traditional importance in Bhilangana valley of Tehri Garhwal". *Nagarjun* 10: 26–36.

2572. **Kala, C.P. 1998.** Ethnobotanical survey and propagation of rare medicinal herbs in the buffer zone of Valley of Flowers National Park, Garhwal Himalaya. Project Report submitted to ICIMOD, Kathmandu, Nepal.

2573. **Kala, C.P. 2002a.** *Medicinal Plants of Indian Trans-Himalaya.* Bishen Singh Mahendra Pal Singh, Dehradun.

2574. **Kala, C.P. 2002b.** "Indigenous knowledge of Bhotia tribal community on wool dying and its present status in the Garhwal Himalaya, India". *Curr. Sci.* 83: 814–817.

2575. **Kala, C.P. 2003.** "Indigenous uses of plants as health tonic in Uttaranchal Himalaya, India". *Ann. Forest.* 11(2): 249–254.

Abstract: Uttaranchal, a newly created State in the Indian Himalaya, is well known for its rich biodiversity, edemic, threatened and endangered medicinal plants. Among the various ethnic communities i.e. Bhotiya, Buxa, Tharu and Ragis, the pattern of natural resources use for health from time immemorial is a well known fact. The literature and field survey carried out in Uttaranchal revealed that the State harbours a total of 44 plant species, which are used as a general health and hair tonic. About 8 species are exclusively used as hair tonic whereas 37 species are used as general health tonic. *Arnebia benthamii, A. Euchroma, Dactylorhiza hatagirea, Nardostachys grandiflora, Polygonatum verticillatum, Bergenia stracheyi, Meconopsis aculeate* and *Gloriosa superba* are frequently used rare and endangered plant species. However, due to lack of coordinated effort on the part of the indigenous people, organizational setup, institutional backup and proper initiative such knowledge systems and practice has been confined to a very limited number of people and region. There is an urgent need of value addition in such tonic so that they are improved, preserved for longer duration, made available round the year and scientific analysis of their compound is established before it is patented. The present communication deals with this aspect in detail in all these aspects.

2576. **Kala, C.P. 2004.** "Indigenous uses and structure of Chir Pine forest in Uttaranchal Himalaya, India". Int. J Sustain. Develop. & World Ecol. 11(2): 205–210.

Abstract: Chir pine (*Pinus roxburghii* Sarg.) is one of the most useful tree species in the Himalayan region. I studied the various indigenous uses and the structure of chir pine forests in the Uttaranchal Himalaya, India. Field surveys were conducted in 50 villages of Uttaranchal to gather information on the indigenous uses of chir pine. The questionnaire that was used in data collection was modified on the spot following group discussions with the target groups, other villagers and local resource persons. For the assessment of chir pine availability in nature, at least 15 quadrats of 10 m x 10 m were laid randomly in each locality, and the number of individuals along with other dominant tree and shrub species were enumerated in each quadrat. Out of many uses of chir pine, ten indigenous uses are prominent in Uttaranchal. The resin is one of the most important non-wood products obtained from chir pine. Besides resin, different plant parts of chir pine such as cones, trunk, stems, wood, leaves and bark are used by the indigenous community of the state. Chir pine is a subject of the folklore and mythology of indigenous cultures in Uttaranchal. Staying in the forests of chir pine is recommended for the treatment of asthma by local herbal healers. In Uttaranchal, there are three major communities of chir pine such as sal-pine, (*Shorea robusta-Pinus roxburghii*) pine pure stand and oak-pine (*Quercus leucotrichophora-Pinus roxburghii*) communities. The communities of chir pine forests are the habitats of various types of edible mushrooms (e.g. *Agaricus campestris, Cantharellus cibrosius, Collybia maculata, Morchella esculenta,* and *Sparassis crispa*). Many other tree and shrub species grow inside pine forests (e.g. *Rubus ellipticus, Fragaria vesca, Myrica esculenta, Berberis* spp., *Carissa carandus, Carissa opeca,* etc.) and have multiple

indigenous uses. The results of this study are discussed in the light of the commercialization of chir pine and conservation and management policies.

2577. **Kala, C.P. 2005a.** "Indigenous uses, population density, and conservation of threatened medicinal plants in protected areas of the Indian Himalayas". *Conserv. Biol.* 19(2): 368–378.

Abstract: For 10 years author monitored the population density of threatened medicinal plant species in seven protected areas in the Indian Himalayas. He also documented the indigenous uses of threatened medicinal plants through interviews with 138 herbal healers (83 Tibetan healers and 55 Ayurvedic healers) residing in the buffer zone villages of these protected areas. To assess the population status of threatened medicinal plant species, he sampled the 10 major habitat types in the protected areas. In all, he found 60 threatened medicinal plant species during the study period, of which 54 species occurred in the sampling plots. Twenty two percent of threatened medicinal plant species were critically endangered, 16% were endangered, and 27% were vulnerable. Thirty two threatened medicinal plant species were endemic to the Himalayan region. The density of threatened medicinal plant species varied with protected areas. The Valley of Flowers protected area had the highest number of threatened medicinal plant species. The "moist" habitat type was richest in these species among all 10 habitat types sampled. *Arnebia euchroma* (Royle ex Benth.) Johnston and *Ephedra gerardiana* Wall. ex Stapf. were the most common threatened medicinal plant species. The indigenous groups of healers used these threatened species in curing about 45 different ailments. Based on my findings, he believe that to ensure the long term sustainability of threatened medicinal plants, medicinal plant conservation areas should be established.

2578. **Kala, C.P. 2005b.** "Local preferences of ethnobotanical species in the Indian Himalaya: Implication for environmental conservation". *Curr. Sci.* 93: 12–25.

2579. **Kala, C.P. 2005c.** "The Valley of Flowers– A newly declared World Heritage Site". *Curr. Sci.* 89(6): 919–920.

2580. **Kala, C.P. 2005d.** "Current status of medicinal plants used by traditional vaidyas in Uttaranchal State of India". *Ethnobotany Res. & Applications* 3: 267–278.

Abstract: The current status of medicinal plants used by traditional Vaidyas was studied in Uttaranchal state of India. Information was gathered using semi-structured questionnaires among 60 traditional Vaidyas. They were questioned about the types of ailments treated with plants and the preparation of herbal medical formulations. A total of 243 herbal medical formulations prepared by Vaidyas treating 73 different ailments were documented. Plants were the major ingredients in these medical formulations. 156 medicinal plant species were documented during the survey. Of these 55% were cultivated and 45% were wild species. Of the cultivated species 80% were found growing in the kitchen gardens and 20% in the agricultural fields. The frequency of use of kitchen garden species was highest in preparing the medical formulations as in 243 formulations the relative frequency of use of such species was 87%. The relative frequency of use of the medicinal plants growing in the wild was 55% in preparing herbal medical formulations. There was a sharp decline in the

number of traditional Vaidyas through generations. The loss of knowledge on preparing medicine was due to several reasons including the number of Vaidyas coming forward to adopt this traditional healing practice professionally.

2581. **Kala, C.P. 2006.** "Ethnobotany and ethnoconservation of *Aegle marmelos* (L.) Correa". *Indian J. Tradit. Knowl.* 5(4): 537–540.

Abstract: The paper highlights the ethnobotany and ethnoconservation of *Aegle marmelos* (L.) Correa, generally known as Bael among different traditional herbal healer and practitioners of the Ayurveda across the uttaranchal state. Of 66 ethnobotanical uses of bael documented, 48 were found to be medicinal and 18 were of other ethnobotanical purposes. The importance of bael in ethnomedicine and for religious purposes is of utmost significance. Almost all parts of bael tree are used in preparing herbal medicine. The most common use of bael is to cure the gastrointestinal disorders. Historically, certain ethnoconservation norms have been set-aside with a view to conserve such an important tree species for its long-term sustainability.

2582. **Kala, C.P. 2007a.** "Local preferences of ethnobotanical species in Indian Himalaya: Implications for environmental conservation". *Curr. Sci.* 93: 1828–1834.

2583. **Kala, C.P. 2007b.** "Prioritization of cultivated and wild edibles by local people in the Uttaranchal hills of Indian Himalaya". *Indian J. Tradit. Knowl.* 6(1): 239–244.

Abstract: The paper deals with the preferences of local communities on the cultivated and wild edible plant species in an Indian Himalayan state, Uttaranchal. The state is comprised of 13 districts, which have 5 major tribal communities (i.e. Bhotiya, Jaunsari, Boksha, Tharu and Raji). The preferences of local people on the cultivated and wild edible plant species varied across the different localities. A total 23 cultivated food crop species and 15 wild edible fruit species were prioritized as the most preferred species by the local people in the study area. Of the prioritized food crops, *Triticum aestivum, Oryza sativa, Eleusine coracana, Hordium vulgare* and *Brassica campestris* were common preferences of local people, whereas of the wild edible fruits *Myrica esculenta, Berberis asiatica, Rubus ellipticus* and *Ficus auriculata* were the common preferences of local people in Uttaranchal. The preferences for different food plants by the local people are further discussed in the changing socio-cultural and socio-economic context.

2584. **Kala, C.P. 2010.** *Medicinal Plants of Uttarakhand - Diversity, Livelihood and Conservation.* Biotech Books, New Delhi.

2585. **Kala, C.P. 2011.** "Medicinal plants used for dermatological disorders: A study of Uttarakhand state in India". *Australian J. Medical Herbalism* 23(3): 132–137.

Abstract: Worldwide, from the historical past, skin diseases have serious impacts on the quality of human life. Although attempts have been made to cure skin related disorders by applying modern medicines, skin diseases are still mainly cured by traditional healers in rural areas using plant species. In this context the specific objectives of this study were to identify and document the uses of plant species for curing skin diseases, to understand the skin related disorders and their treatment by traditional herbal healers. Sixty six herbal healers living across 13 districts of Uttarakhand state in India were interviewed using a structured questionnaire survey. One hundred and thirty three plant species were documented for use in curing 19 types of skin diseases such as, frost bite, pimples, itching, eczema, leprosy, bruises, carbuncles, small pox, scabies and wounds. Most of the species were used to cure a limited number of skin diseases, whereas a few species were used to cure over 5 types of skin diseases. *Ageretum cornyzoides* was used in curing 9 types of skin diseases including burns, septic wounds, scabies, swelling, boils, sores, cuts and wounds. *Azadirachta indica, Vitex negundo, Woodfordia fruticosa, Allium cepa* and *Cuscuta reflexa* were other important species used to cure 4-5 types of skin diseases. Since the modern system of medicine is unable to afford treatments for all types of skin diseases, the effective treatment of skin diseases using medicinal plants, as evident from the present study, will help to improve the quality of human life.

2586. **Kala, C.P. 2015.** "Medicinal and aromatic plants of Tons Watershed in Uttarakhand Himalaya". *Appl. Ecol. & Environm. Sci.* 3(1): 16–21.

Abstract: The rich plant diversity of Uttarakhand hills has provided an initial advantage to the local people for scrutinizing various plant species for the purpose of food, medicine, perfumes and spices. Over the years, they have accumulated a great deal of knowledge on the use of plant species. The present study aims to document such information, especially the use of plants for curing diseases and as perfumes. Field surveys carried out in the villages of Tons watershed have resulted in the documentation of 84 medicinal, aromatic and spice plant species. These species were distributed over various life forms, of which 19 were tree species, 12 were shrub and 53 were herbaceous species. For curing various ailments, the use of aboveground plant parts was relatively higher (57%) than the belowground plant parts. Different belowground plant forms such as root, tuber, rhizome and bulb were used for preparing herbal medicine for curing ailments. About 17% of these species, which include *Picrorhiza kurrooa* Benth., *Dactylorhiza hatagirea* (D.Don) Soo, *Arnebia benthamii* (D. Don) Johnston, *Podophyllum hexandrum* Royle, *Polygonatum verticillatum* (L.) All., *Rheum australe* D. Don and *Angelica glauca* Edgew. have become threatened due to several natural and anthropogenic pressures. Sustainable utilization of these valuable plant species is an urgent need of hour.

2587. **Kala, C.P. 2018.** "Ethnobotanical study of promising species used for making chutney in Uttarakhand, Western Himalaya". *J. Non-Timber Forest Prod.* 25(2): 73–76.

Abstract: An ethnobotanical study was conducted in the Uttarakhand state of India, through questionnaire survey, to investigate various plant species and their parts used for making chutney- a special spicy condiment made of fruits or vegetables. Thirty eight plant species belonging to 19 families were documented during the survey. Polygonaceae, Rosaceae and Rutaceae were the most dominant families in terms of use of number of species for making chutney. The fruits of majority of such species were used for tis purpose, followed by flowers and leaves. Apart for making chutney, these species were also found used for treatment of over 32 types of ailments, including indigestion, blood purification, cough and toothache. Most of the species were collected from the wild. Of the 38 species *Rheu webbianum* and *Berberis asiatica* are endangered.

2588. **Kala, C.P. 2019.** "Medicinal plants used for treatment of fever and headache in Uttarakhand state of India". *J. Non-Timber Forest Prod.* 26(1): 39–44.

Abstract: The fever and headache are the most common diseases in human beings, and still, they are the cause of a large number of human deaths around the world. Historically, these diseases have been treated by using plant species. The present study, therefore, attempts to document plant use for treatment of fever and headache in the Uttarakhand state of India.

2589. **Kala, C.P. & Rawat, G.S. 2001.** Human use and conservation status of wild medicinal herbs in the Bhyundar Valley, Western Himalaya. In: Pande, P.C. & Samant, S.S. (Eds.), *Plant Diversity of the Himalaya*. Gyanodaya Prakasan, Nainital. Pp. 547–559.

2590. **Kala, C.P., Dhayani, P.P. & Sajwan, B.S. 2006.** "Developing the medicinal plants sector in Northern India: Challenges and Opportunities". *J. Ethnobiol. & Ethnomed.* 2(32): 1–15.

Abstract: The medicinal properties of plant species have made an outstanding contribution in the origin and evolution of many traditional herbal therapies. These traditional knowledge systems have started to disappear with the passage of time due to scarcity of written documents and relatively low income in these traditions. Over the past few years, however, the medicinal plants have regained a wide recognition due to an escalating faith in herbal medicine in view of its lesser side effects compared to allopathic medicine in addition the necessity of meeting the requirements of medicine for an increasing human population. Through the realization of the continuous erosion of traditional knowledge of plants used for medicine in the past and the renewed interest at the present time, a need existed to review this valuable knowledge of medicinal plants with the purpose of developing medicinal plants sectors across the different states in India. Our major objectives therefore were to explore the potential in medicinal plants resources, to understand the challenges and opportunities with the medicinal plants sector, and also to suggest recommendations based upon the present state of knowledge for the establishment and smooth functioning of the medicinal plants sector along with improving the living standards of the underprivileged communities. The review reveals that northern India harbors a rich diversity of valuable medicinal plants, and attempts are being made at different levels for sustainable utilization of this resource in order to develop the medicinal plants sector.

2591. **Kala, C.P., Farooquee, N.A. & Dhar, U. 2004.** "Prioritization of medicinal plants on the basis of available knowledge, existing practices and use value status in Uttaranchal, India". *Biodiv. & Conserv.* 13(2): 453–469.

Abstract: In order to understand the pattern of indigenous uses of medicinal plants available in the Uttaranchal state of the Indian Himalaya, this study was undertaken through literature survey and fieldwork in various parts of the state. A list of all the major and most of the lesser categories of ailments was prepared and categorized with the help of medical practitioners. A total of 300 plant species used in curing 114 ailments prevailing in various ethnic and non-ethnic communities of Uttaranchal were documented. These 114 ailments were further grouped into 12 broad classes of diseases in order to project the indigenous uses of medicinal plants for various ailments. It was found that herbs contributed the highest number of medicinal plants (65%), followed by shrubs (19%) and trees (16%). The maximum number of plant species was used to cure generalized body aches and colic, followed by gastrointestinal and dermatological problems. *Vitex negundo* was the most important species, used for the treatment of more than 48 ailments. *Azadirachta indica*, *Woodfordia fruticosa*, *Centella asiatica*, *Aegle marmelos*, *Cuscuta reflexa*, *Butea monosperma*, *Phyllanthus emblica*, and *Euphorbia hirta* were among other important medicinal plants based on their high use values. The underground parts of the plant were used in the majority of cases. Of 300 medicinal plants, 35 were rare and endangered species, of which about 80% was restricted to the high altitude alpine region of Uttaranchal Himalaya. A priority list of 17 medicinal plant species was prepared on the basis of endemism, use value, mode of harvesting and rarity status. Strategies for long-term conservation of these valuable medicinal plants are discussed.

2592. **Kala, C.P., Farooquee, N.A. & Dhar, U. 2005.** "Traditional uses and conservation of Timur (*Zanthoxylum armatum* DC.) through social institutions in Uttaranchal Himalaya, India". *Conserv. & Soc.* 3(1): 224–227.

Abstract: The paper deals with (i) analyse the indigenous knowledge of local people on different uses of *timur,* (ii) the impact of trade, (iii) and the role of traditional panchayat institutions in regulating harvesting limits for conservation of *timur* in the Uttaranchal Himalaya.

2593. **Kalakoti, B.S. & Pangtey, Y.P.S. 1988.** "Ethnomedicine of Bhotia tribes of Kumaun Himalaya (U.P.). *Bull. Med.-Ethno-Bot. Res.* 9: 11–20.

2594. **Kandari, L.S., Phondani, P.C., Payal, K.C., Rao, K.S. & Maikhuri, R.K. 2012.** "Ethnobotanical study towards conservation of medicinal and aromatic plants in upper catchments of Dhauli Ganga in the central Himalaya". *J. Mountain Sci.* 9(2): 286–296.

Abstract: The present study broadly focused on medicinal plant species collected from wild by the villagers for different purposes in the upper catchment of Dhauli Ganga in Nanda Devi Biosphere Reserve (NDBR), in the central Himalaya. A schedule based survey was conducted during the years 2003–2005 in 15 villages of Chamoli district part of the NDBR. Information was collected from collectors, vaidya (medicine man) and those dealing with domestication and marketing of the medicinal plants. The aim of the study was to understand the prioritiesed medicinal plants, their mode of collection and document their ethnobotanical uses by the Bhotiya tribal communities, in this world heritage site. During the survey, 50 medicinal plants belonging to 31 families and 44 genera were documented. Out of these, 70% were harvested from the wild, 22% were cultivated and 8% were cultivated as well as wild harvested. Of the cultivated species, 8% were found growing in the kitchen gardens and 14% in the agricultural fields. However, 42% of the plants had their roots and rhizomes used followed by leaves (26%), seeds (10%), seed and leaf (8%), bark and whole plant (6%) and flower (1%). Most plants were reported to be used for rheumatism (16), followed by stomach disorder (14), cold and cough (11), and jaundice (9). Thirty three plants species were reported to have more than one therapeutic uses, while 17

species were reported to be used against single ailment. The distance of villages from road head was one of the factors contributing to the decline in the medicinal plant population in their natural habitats. The availability of medicinal plants increased with increase in distance from road head and also the peoples' dependence on them. Documentation of the traditional knowledge will help in conservation of knowledge and also opportunity for using it for future training and use. The result of this study will help in promoting sustainable cultivation and implementation in conservation protocol of those species, which are in the verge of extinction in this region.

2595. **Kandari, L.S., Rao, K.S., Maikhuri, R.K., Kharkwal, G., Chauhan, K. & Kala, C.P. 2011.** "Distribution pattern and conservation of threatened medicinal and aromatic plants of Central Himalaya, India". *J. Forest. Res.* 22(3): 403–408.

Abstract: A study was conducted to examine the distribution pattern of four rhizomatous medicinal and aromatic plant species (MAPs) viz., *Angelica glauca, Pleurospermum angelicoides, Rheum emodi* and *Arnebia benthamii* in different forest stands in Central Himalaya. Results show that *A. glauca* and *P. angelicoides* had a higher (50%) frequency at Chipkoan, Garpak and Phagati forest, *R. emodi* had a higher (60%) frequency at Rishikund, Suki and Himtoli, and *A. benthamii* had a higher (70%) frequency at Suki and Khambdhar The densities of *A. glauca* (0.6 plants/m^{-2}) and *P. angelicoides* (0.5 plants/m^{-2}) were higher at Chipkoan and Garpak sites than at other micro-sites, while densities of *R. emodi* (0.8 plants/m^{-2}) and *A. benthamii* (1.0 plants/m^{-2}) were higher at Suki and Khambdhar sites. *A. glauca* had highest total basal covers (TBC) (1.2 cm^2/m^{-2}) at Chipkoan, *P. angelicoides* had highest TBC (0.92 cm^2/m^{-2}) at Lati kharak site, *A. benthamii* had the highest TBC (6.48 cm^2/m^{-2}) at Khambdhar, and *R. emodi* had highest TBC (4.53 cm^2/m^{-2}) at Rishikund. For the four studied species, *A. glauca* showed a contagious distribution, *P. angelicoides* and *R. emodi* showed the random and *A. benthamii* showed the regular type of distribution.

2596. **Kanta, C., Devi, K.M. & Sharma, I.P. 2018.** "Biochemical and antioxidant screening of three important medicinal plants from Dehradun, Uttarakhand". *Int. J. Bot. Stud.* 3(2): 103–107.

Abstract: Physiological and antioxidant potential of important medicinal plants *i.e. Cassia fistula, Terminalia arjuna* and *Azadirachta indica* were determined. The radical scavenging activity of extracts was evaluated using 2, 2-diphenyl-1-picryhydrazyl (DPPH) assay and The total phenolic content was determined by following Folin-Ciocalteau assay. In the results different plants showed different activities, in the case of Chlorophyll a (*Chl a*) and chlorophyll b (*Chl b*) maximum recorded in *Azadirachta indica* and *Terminalia arjuna* respectively while minimum in *Cassia fistula*. In case of carotenoid and protein contents were found maximum in *Cassia fistula* and minimum in *Terminalia arjuna*. Antioxidant activity *i.e.,* DPPH and total phenolic contents were found maximum in *Terminalia arjuna* and minimum in *Cassia fistula*. These finding indicated that the *Terminalia arjuna* have most potent antioxidant potential as comparison with other two species. The present study reveals that the selected plants would exert beneficial effects by virtue of their antioxidant activity and could be harnessed as drug formulation.

2597. **Kanwal, K.S. & Joshi, H. 2015.** "Medicinal plants diversity, indigenous uses and conservation status in Alaknanda valley of Western Himalaya, Uttarakhand, India". *Indian Forester* 141(6): 660–669.

Abstract: The present study deals with medicinal plants used in various traditional systems of medicine in Alaknanda valley of Uttarakhand. An ethnomedicinal survey was conducted during the year 2008 to 2010 in various towns and villages of the Alaknanda valley. Information on ethnomedicinal importance of the plant species was collected through interviews and discussions with the local communities. A total of 98 plant species used for medicinal purposes were recorded during the intensive surveys. In most cases, the underground parts (roots/rhizomes/tubers) (22%) are used for medicinal purposes, followed by leaves (19%), whole plant (17%), bark (11%), fruits (9%), flowers (8%), stem (6%) and seeds (8%) of the plants. Maximum number of species were recorded from family Asteraceae (8spp.), followed by Euphorbiaceae, Lamiaceae, Rosaceae, Ranunculaceae (4 spp. each), Meliaceae, Pinaceae, Polygonaceae (3 spp. each). Some commercially important medicinal plant species are facing threat due to habitat degradation, over exploitation and sustainable harvesting in the study area.

2598. **Kapoor, S.L., Mitra, R. & Kapoor, L.D. 1975.** "Pharmacognostic study of the root and rhizome of *Parnassia nubicola* Wall. ex Royle (Fam.: Parnassiaceae), a species used as 'Mamira'". *Bull. Bot. Surv. India* 17(1-4): 1–6.

Abstract: A survey conducted in the neighbourhood of Kedarnath and the adjoining area brought to light that the wayside traders employ roots and rhizomes of *Parnassia nubicola* Wall. ex Royle (Parnassiaceae) as 'Mamira', reputed to be good for various eye ailments. The roots of this species look similar in gross appearance to those of *Thalictrum foliolosum* DC. (Ranunculaceae), which is one of the various species that have been attributed to 'Mamira' (Chopra *et al*, 1956). The present paper deals with a detail pharmacognosy of the root and rhizome of *Parnassia nubicola* Wall. ex Royle.

2599. **Kar, R. & Joshi, B. 2014.** "Ethnomedicinal plants of Lakhimpur-Kheri district, Uttar Pradesh (India)". *J. Non-Timber Forest Prod.* 21 (2): 113–126.

Abstract: In the present paper, 71 plant species under 61 genera belonging to 35 families used in folk medicines to treat 51 diseases and conditions have been documented. Over half of all species reported are used for skin diseases, fever and stomachache. Leaves and the roots are the most commonly used plant parts, with almost half of all plants reported. The most common methods of remedy preparation are decoction and powder. Some wild plants are also used as vegetables, fruits, fibre, ceremonial, sacred, traditional beliefs and other various purposes.

2600. **Kaur, R. & Joshi, S.P. 2010.** "Ethnobotany of wild plants of Govind Wildlife Sanctuary and National Park, Uttarakhand". *Indian Forester* 136(8): 1104–1113.

Abstract: Govind Wildlife Sanctuary and National Park, Uttarakhand is characterised by rich diversity of ethno-botanical plants. The present investigations is an attempt for the documentation of MFPs used by local people of the sanctuary, from the floristic diversity data collected on September 2005 to March 2007. We used

participatory rural appraisal and standard vegetation sampling methods in three sites located at different altitude, to investigate about the ethnobotany of plants. The present study reveals that the 173 plants belonging to different families are used for various purposes by local people. From 137 species reported from the Har-ki-Dun site, 112 species out of them were MFPs whereas in Osla site out of 64 species recorded, 30 species were MFP and in Bencha site within 47 species, 17 were MFP species. The 14 MFP species were reported from other locations in the sanctuary.

2601. **Khadda, B.S., Singh, B., Singh, D.V., Singh, J.L., Singh, S.K., Singh, C.B. & Singh, D. 2018.** "Inventory of traditional ethno-veterinary practices followed by goat keepers in Uttarakhand". *Indian J. Tradit. Knowl.* 17(1): 155–161.

Abstract: A bench mark survey was conducted to collect the information on common diseases inflicting losses to the goats along with the use of local plants, plants parts and other traditional healthcare practices followed by the goat keepers of Uttarakhand. The results of the study revealed that diarrhoea, pneumonia, gastrointestinal helminthiasis, external parasites, retention of placenta and plant poisoning were very common problems and most of the goat keepers used the traditional medicines to treat these diseases/ ailments. Different plant species and their parts, viz. roots, leaves, bark powder, seeds and oils are used for treatment of these ailments.

2602. **Khajuria, A.K., Kumar, G. & Bisht, N.S. 2017.** "Diversity with ethnomedicinal notes on Orchids: A case study of Nagdev forest range, Pauri Garhwal, Uttarakhand, India". *J. Med. Pl. Stud.* 5(1): 171–174.

Abstract: Pauri one of the hilly stations of Garhwal Himalaya, repository of unique and rich vegetation in wide range of habitats and harbors the treasure of medicinal plants. In the present investigation an attempt has been made to document the diversity and medicinal importance of terrestrial Orchids in temperate forest of Pauri Garhwal, Uttarakhand. Total 4 genera and 7 species of orchids were reported with medicinal value. Due to habitat specificity, over grazing and illegal collection of Orchids they are under stress of extinction. Hence it is the need of the hour to carry out such investigation which would be help full in future for planning the conservation of orchids of this region.

2603. **Khan, A.V. & Khan, A.A. 2005a.** "Ethnomedicinal uses of *Achyranthes aspera* l. (Amaranthaceae) in management of gynaecological disorders in western Uttar Pradesh (India)". *Ethnobot. Leafl.* 2005.

Abstract: This communication records the ethno-medicinal uses of *Achyranthes aspera* in management of gynecological disorders in rural areas of Aligarh, Badaun, Bulandshahar, Farrukhabad and Hatharas districts of Western Uttar Pradesh, India. The claims were gathered by interviewing traditional healers, especially women, of the study area. Attempt was made to verify the efficacy of claims with actual beneficiaries, though it was not possible in all cases due to social customs. A total of twenty-three claims are recorded and twelve of them appear to be hitherto unknown.

2604. **Khan, A.V. & Khan, A.A. 2005b.** "Herbal folklores for male sexual disorders and debilities in western Uttar Pradesh". *Indian J. Tradit. Knowl.* 4(3): 317–324.

Abstract: A survey of medicinal plants prescribed by the local medicine men and traditional healers in five districts of western Uttar Pradesh, lead to interesting therapeutic applications of 30 plant species belonging to 20 families for different male sexual disorders and debilities. Among them, 18 ethnomedicinal claims used for such complaints were recorded for the first time from the study area.

2605. **Khan, S. 2014.** "Study of wild edible plants of Banda district (U.P.) with special reference to their ethnobotanical significance". *Ethnobotany* 26: 100–102.

Abstract: Ethnobotanical studies on wild edible plants of Banda district (U.P.) was carried out during the year 2012-2013. A total of 15 wild edible plants belonging to 13 families are enumerated in the present communication as used by the tribals. The report of ethnobotanical significance of these plants are described along with their botanical name, local name and parts used for edible purpose.

2606. **Khanna, K.K. 2002a.** "Unreported ethnobotanical uses of plants from the tribal and rural folklores of Gonda district, Uttar Pradesh". *Ethnobotany* 14: 52–56.

Abstract: The paper reports new information on ethnomedicinal uses of 30 plant species (in 22 families) collected from Tharu tribe and rural inhabitants of Gond district, Uttar Pradesh. Local names, dosage, mode of administration and locality have been presented. Five species are reported to treat stomach diseases, four to treat boils and cholera and two to treat chest pain, eye diseases, leucorrhoea, throat infection, skin diseses, dog bite and as aphrodisiac. For a number of other ailments like heacahe, earache, urinary diseases, coma, body swelling and as tonic only one plant is reported to be efficacious.

2607. **Khanna, K.K. 2002b.** Ethnobotany of five districts of Terai region, Uttar Pradesh. In: Trivedi, P.C. (Ed.), *Ethnobotany*. Aviskar Publishers and Distributors, Jaipur, pp. 128–145.

2608. **Khanna, K.K. & Kumar, R. 2000.** "Ethnomedicinal plants used by the Gujjar tribe of Saharanpur district, Uttar Pradesh". *Ethnobotany* 12: 17–22.

Abstract: An account is given of the ethnomedicinal uses of 50 plant species known among the Gujjar tribe of Saharanpur district, Uttar Pradesh (settled for the last 40 years after their migration from Jammu). Comparison of these uses with those mentioned in the concerned literature has indicated that 22 ethnomedicinal uses of plants have not been reported earlier.

2609. **Khanna, K.K. & Mudgal, V. 1992.** "Ethnobotanical data from the herbarium of Botanical Survey of India, Central Circle, Allahabad". *Bull. Bot. Surv. India* 34(1-4): 112–135.

Abstract: The paper deals with an account of the ethnobotanical data of 234 species and one variety under 72 families gathered from the herbarium of Botanical Survey of India, Central Circle, Allahabad. An analysis indicated that the data cover a variety of uses of plants, viz., edible, medicinal, rope, timber, oil, tannin, resin, worship, sponge, fish poison, detergent, broom, jelly, dye, bridal crown, manure, agarbatti, vermillion, etc. A comparison of findings with relevant literature indicated that the uses of 70 species have not been documented earlier.

2610. **Khanna, K.K., Shukla, G. & Mudgal, V. 1996.** "New traditional medicinal uses of plants from Jalaun district, Uttar Pradesh". *J. Econ. Taxon. Bot.,* Addl. Ser. 12: 108–111.

Abstract: The paper describes unreported medicinal uses of 33 plant species recorded from the rural folklore of Jalaun district, Uttar Pradesh. Informations on local names, ethnomedicinal uses, dosage, mode of administration and locality are presented in this paper. The findings indicated that four plant species are fereffred to check fever and antidote to scorpion sting, snake and dog bite, three to treat diabetes and rheumatism and two to cure cancer and as anthelmintic, whereas single plant species has been referred to for the treatment of a number of diseases like diarrhoea, mumps, pyorrhoea, leucorrhoea, boils, baldness, tuberculosis, etc.

2611. **Khanna, K.K., Srivastava, P.K. & Mudgal, V. 1996.** "Noteworthy medicinal plant uses from rural folklore of Raebareli district, Uttar Pradesh". *J. Econ. Taxon. Bot.,* Addl. Ser. 12: 118–122.

Abstract: An account of unreported medicinal uses of forty three plant species known amongst the rural inhabitants of Raebareli district, Uttar Pradesh has been dealt with in the paper. An analysis of findings indicated that five plant species are employed as antidote to snake bite and scorpion sting foolowed by three plant species for the treatment of tuberculosis, leucorrhoea and boils. On the other hand, less number of plant species are referred to for a number of diseases like wounds, mouth sore, anaemia, pyorrhoea, night blindness, headache, earache, skin diseases, fever, cough, cold, piles, gonorrhoea, baldness, etc. It has been concluded that these findings require thorough pharmacological investigations.

2612. **Khanna, K.K., Mudgal, V., Shukla, G. & Srivastava, P.K. 1993.** "New medicinal plant uses recorded from tribal and rural folklore of Bahraich district, U.P.". *Proc. Natl. Acad. Sci., India* 63B: 13–18.

2613. **Khanna, K.K., Mudgal, V., Shukla, G. & Srivastava, P.K. 1996a.** "Unreported ethnomedicinal uses of plants as aphrodisiac from the folk-lores of Uttar Pradesh plains, India". *Bull. Bot. Surv. India* 36(1-4): 91–94.

Abstract: The paper deals with unreported medicinal uses of eighteen plant species (belonging to sixteen families) exploited as aphrodisiac among the folk-lores of Uttar Pradesh plains, India. The data are outcome of ethnobotanical survy of more than 300 villages of nine districts viz., Bahraich, Gonda, Hamirpur, Jalaun, Mirzapur, Pratapgarh, Raibareli, Sidharthnagar and Sultanpur. Local name of plant, part of plant used, mode of drug preparation, administration and doses are given under each species.

2614. **Khanna, K.K., Mudgal, V., Shukla, G. & Srivastava, P.K. 1996b.** "Unreported ethnomedicinal uses of plants from Mirzapur district, Uttar Pradesh". *J. Econ. Taxon. Bot.,* Addl. Ser. 12: 112–117.

Abstract: An account of unreported ethnomedicinal uses of twenty seven plant species from the tribals as well as rural folklore of Mirzapur district (northern portion of previously known Mirzapur district) has been dealt in the paper. The data are outcome of ethnobotanical survey of about 70 villages covering all the tehsils of the district

and seven tribes (Bayar, Bind, Chero, Dhakhar, Kol, Musahar, Gond) as well as rural people. Informations on local name of the plant, ethnomedicinal uses, dosages, mode of administration and locality have been provided in the paper. The findings have indicated that eight plant species have been referred to for the treatment of stomach diseases followed by four plant species to relieve headache and three plant species for cooling effect and as antidote of scorpion sting. On the other hand, one or two plant species have been referred to for a number of ailments like malaria, boils, wounds, gonorrhoea, leucorrhoea, bodyache, tonic, cold, arthritis, leprosy, fever, etc.

2615. **Kharkwal, K., Ambrish, K., Kant, R. & Bhakuni, K. 2017.** "Economic and medicinal plant resources of Champawat and its adjacent areas of Kumaun Himalaya, Uttarakhand". *Ann. Forest.* 25(1&2): 19–30.

Abstract: The present research paper provides a scientific information about the economic and medicinal plant resources of Champawat and its adjoining areas in Kumaun region of Uttarakhand. A total of 101 plant species of common economic and medicinal uses belonging to 91 genera under 59 families have been reported from the study area. Out of which, 82 plant species are of angiosperms belonging to 76 genera under 47 families, 2 species of gymnosperms belonging to 2 genera under 1 family, 12 species of pteridophyta belonging to 8 genera under 6 families., 2 species of bryophytes belonging to 2 genera under 2 families, 2 species of fungi belonging to 2 genera under 2 families and 1 species of lichen found as wild or naturalised in the study area. These all plant species are mostly being used as economic and medicinal plant resources by the poor rural people of this area to enhance their livelihood.

2616. **Kharkwal, K., Ambrish, K., Kant, R., Singh, S. & Nautiyal, S. 2018.** "Ethno-medicinal plants used by the local vaidyas of Champawat district, Uttarakhand, Kumaun Himalaya". *J. Non-Timber Forest Prod.* 25(4): 203–208.

Abstract: The present paper deals with the survey and documentation of ethno-medicinal plants used by the local vaidys of Champawat district, Uttarakhand, in the treatment of various diseases and disorders. A total of 50 plant species belonging to 49 genera under 36 families have been reported from the study area, which are being used as ethno-medicines by the local vaidyas.

2617. **Kimothi, G.P. & Shah, B.C. 1989.** "Some medicinal plants of Gopeshwar- Tungnath region of Uttar Pradesh". *Ancient Sci. Life* 8(3-4): 283–292.

Abstract: This paper deals with medicinal plants of Gopeshwar-Tungnath region of Chamoli district of Uttar Pradesh based on the exploration. In all, 45 species are enumerated in this study.

2618. **Kumar, A., Bisht, P.S. & Kumar, V. 2002.** "Traditional medicinal plants of Uttaranchal Himalayas". *Asian Agri-Hist.* 6: 167–171.

2619. **Kumar, A., Tewari, D.D. & Pande, Y.N. 2003.** "Ethno-phytotherapeutics among Tharus of Beerpur-Semra forest range of Balrampur district (U.P.)". *J. Econ. Taxon. Bot.* 27(4): 839–844.

Abstract: Present communication deals with 53 ethno-phytotherapeutics into the Beerpur-Semra forest range of Balarampur district of North-East U.P. inhabited by one of the most primitive tribe Tharu. They live in Narihawa, Bhukuruwa, Perbatia and Bhawanipur villages. The forest, forest products and traditional wild as well as cultivated plants are the main sources of their medicine and drugs. The present work is an attempt to highlight sch medicinal plants used by Tharus for treatment and cure of different diseases and ailments.

2620. **Kumar, A., Tewari, D.D. & Tewari, J.P. 2006.** "Ethnomedicinal knowledge among Tharu tribe of Devipatan division". *Indina J. Tradit. Knowl.* 5(3): 310–313.

Abstract: Rich phytogenic diversity and Tharu tribal population characterize Devipatan division situated in Terai belt of Uttar Pradesh. Tharu tribe endowed with vast knowledge of medicinal plants have strong believes in supernatural powers (magicotherapeutic properties) of plants in the treatment or prevention of various ailments. An attempt has been made to document the ethnophytotherapeutics and folk claims.

2621. **Kumar, A., Agarwal, S., Singh, A. & Desh, D. 2012.** "Medico-botanical study of some weeds growing in Moradabad district of western Uttar Pradesh in India". *Indian J. Scientif. Res.* 3(1): 107–111.

Abstract: The present study revealed that 25 plant species belonging to 18 families, plants parts, and local name are used in medicinal purposes and traditional health care system is an old age practice in this area. The system of ethnic communities is conservation oriented and has great potential. Traditional knowledge is transferred for one generation to another. The present work suggests an impressive coordination for strengthening medicinal plant sectorin district Moradabad.

2622. **Kumar, A., Mitra, M., Adhikari, B.S. & Rawat, G.S. 2015a.** "Depleting indigenous knowledge of medicinal plants in Cold-Arid region of Nanda Devi Biosphere Reserve, Westem Himalaya". *Med. Aromat. Pl.* 4(3): 195.

Abstract: Medicinal plants play a vital role in local health care system of indigenous communities in remote areas. However, a declining trend is prevailing with respect to the indigenous knowledge of wild plants across the globe. Based on semi-structured questionnaire surveys and in-depth interviews, the study attempts to document the indigenous knowledge on medicinal plants of an ethnic community in Nanda Devi Biosphere Reserve of India. The study revealed that the locals are knowledgeable of about 38 medicinal plants used for curing 24 different human ailments. However, the practice of utilising medicinal plants in their local healthcare system is sharply declining due to lack of education facility; that has lead to lack of knowledge as well as transfer of knowledge to youger generations. The richness of knowledge about medicinal plants was assessed using Knowledge Richness Index among different age groups. To promote awareness and enhance access on ethno-medicinal wisdom, the management authorities must necessitate educational facilities in the region and the traditional knowledge information portal as recognised by the Convention on Biological Diversity and people's biodiversity register are required to develop.

2623. **Kumar, A., Pandey, V.C., Singh, A.G. & Tewari, D.D. 2013.** "Traditional uses of medicinal plants for dermatological healthcare management practices by the Tharu tribal community of Uttar Pradesh, India". *Genet. Resources & Crop Evol.* 60(1): 203–224.

Abstract: The aim of present study was to explore and document medicinal plants used for the traditional dermatological healthcare management practices by the the Tharu tribal community of Uttar Pradesh. The study was conducted during 2000–2004. Information was gathered from 230 informants residing in 46 villages in Terai region of Indo-Nepal boarder using questionnaires; oral interviews and group discussions. Total 92 medicinal plant species were cited for the preparation of 113 crude drug formulations. Voucher specimens of cited plant species were collected and identified as belonging to 82 genera and 49 families. Thirty-nine medicinal plant species were reported for the first time for dermatological healthcare problems from India. The dermatological healthcare problems managed were cut and wounds, ringworm, leprosy, eczema, scabies, leucoderma, boils, carbuncles, pimples, skin blemishes, spots, eruption, and burns etc. The most commonly and popularly used medicinal plant species for management of dermatological healthcare problems in the study area were *Curcuma longa* L., *Azadirachta indica* A. Juss and *Melia azedarach* L. It is concluded that dermatological healthcare management practice in the study area depends largely on wildly growing medicinal plant species. There is an urgent need to properly conserve the medicinal plant species growing in this area for human welfare. There is also need for further phytopharmacological studies to provide scientific explanation for the usages of 57 medicinal plant species for which to the best of our knowledge phytopharmacological literatures are not available.

2624. **Kumar, A., Padhi, M.M., Dhar, B., Joseph. G.V.R., Bharti, Agrawala, D.K., Joshi, G.C., Mangal, A.K., Rath, C. & Lavania, V.K. (Eds.). 2014.** *Herbal Wealth of Uttarakhand*, Vols. 1-2. CCRAS, New Delhi.

2625. **Kumar, B. 2007.** *Ethnobotany of Religious Practices in Kumaun (Havan)*. Bishen Singh Mahendra Pal Singh, Dehradun.

2626. **Kumar, B. 2009.** “Major religious plants of Rudraprayag district (Garhwal), Uttarakhand India”. *Ethnobot. Leafl.* 13: 1476–1484.

Abstract: The Himalayas are one of the richest sources with respect to the occurrence of religious plants. These plants contribute to religious activities and are also important as food, fodder and medicine. Presented here are the descriptions of 21 religious plants which are traditionally used by local people in the Rudraprayag district (Garhwal) for various religious activities.

2627. **Kumar, M., Sheikh, M.A. & Bussmann, R.W. 2011.** “Ethnomedicinal and ecological status of plants in Garhwal Himalaya, India”. *J. Ethnobiol. & Ethnomed.* 7: 32–44.

Abstract: The northern part of India harbours a great diversity of medicinal plants due to its distinct geography and ecological marginal conditions. The traditional medical systems of northern India are part of a time tested culture and honored still by people today. These traditional systems have been curing complex disease for more than 3,000 years. With rapidly growing demand for these medicinal plants, most of the plant populations have been depleted, indicating a lack of ecological knowledge among communities using the plants. Thus, an attempt was made in this study to focus on the ecological status of ethnomedicinal plants, to determine their availability in the growing sites, and to inform the communities about the sustainable exploitation

of medicinal plants in the wild. The ecological information regarding ethnomedicinal plants was collected in three different climatic regions (tropical, sub-tropical and temperate) for species composition in different forest layers. A total of 57 species of plants were reported: 14 tree species, 10 shrub species, and 33 herb species. In the tropical and sub-tropical regions, *Acacia catechu* was the dominant tree while *Ougeinia oojeinensis* in the tropical region and *Terminalia belerica* in the sub-tropical region were least dominant reported. In the temperate region, *Quercus leucotrichophora* was the dominant tree and *Pyrus pashia* the least dominant tree. A total of 10 shrubs were recorded in all three regions: *Adhatoda vasica* was common species in the tropical and sub-tropical regions however, *Rhus parviflora* was common species in the sub-tropical and temperate regions. Among the 33 herbs, *Sida cordifolia* was dominant in the tropical and sub-tropical regions, while *Barleria prionitis* the least dominant in tropical and *Phyllanthus amarus* in the sub-tropical region. In temperate region, *Vernonia anthelmintica* was dominant and *Imperata cylindrica* least dominant. The consensus survey indicated that the inhabitants have a high level of agreement regarding the usages of single plant. The index value was high (1.0) for warts, vomiting, carminative, pain, boils and antiseptic uses, and lowest index value (0.33) was found for bronchitis.

2628. **Kumar, M.S., Seth, Ankit, Dev Nath Singh, G. & Singh, A.K. 2015.** "Biodiversity and indigenous uses of medicinal plant in the Chandra Prabha Wildlife Sanctuary, Chandauli district, Uttar Pradesh". *Int. J. Biodiv.* 2015: Article ID 394307.

Abstract: Conventional medicines are very important part of Indian culture. In this study the outcome of two-year study of ethnomedicinal uses of plants in Chandra Prabha Wildlife Sanctuary (CPWLS) and nearby area is reported. Information related to different plants which are used by local community in the treatment of many common diseases and well-being in the area was collected. Data on the use of medicinal plants were collected using structured interview of about 122 participants and thorough observations and conversations with local communities. Approximately 100 plants belonging to 43 families used by the local healers were reported in this study. The plant species with the highest fidelity level (FI) were *Holarrhena antidysenterica* Wall. ex A. DC., *Lawsonia inermis* L., *Gymnema sylvestre* (Retz.) R. Br. ex Sm., *Dalbergia sissoo* DC., *Cassia fistula* Linn., *Butea monosperma* (Lam.) Kuntze., *Boerhaavia diffusa* Linn., *Albizia lebbeck* Benth., *Aegle marmelos* Correa., *Sphaeranthus indicus* Linn., and *Solanum surattense* Burm.f. The most frequent ailments reported were hepatitis, jaundice, constipation, and skin and urinary problems. The parts of the plants most frequently used were fruit, roots, and whole plants (17%) followed by leaves (16%) and bark (15%). This study presents new research efforts and perspectives on the search for new drugs based on local uses of medicinal plants.

2629. **Kumar, P. & Dangwal, L.R. 2018.** "Ethno-taxonomy of some useful plants in district Haridwar, Uttarakhand". *J. Pharmacogn. & Phytochem.* 7(4): 1467–1476.

Abstract: The district Haridwar in Uttarakhand state has been the reservoir of enormous natural resources including vegetational wealth. The present work reveals the status of ethno-medicinal flora and their various importance preserved by native people in

Haridwar region. Since inhabitants and tribal communities have strong faith and belief in traditional health care system. The people in remote villages and tribal areas depend upon the plants for their basic requirements, myths, customs and cultural rituals. For the present study on intensive field survey was made for district Haridwar. Local inhabitant have been interviewed along with herbal practioners, vaidhyas, cowherds, shepherds, farmers, ojhas, sadhu-saint during the entire study for identification of plant species and to explore the traditional knowledge.

2630. **Kumar, P., Rawat, L. & Basera, H. 2010.** "Socio-economic studies of Henwal watershed, Tehri Garhwal, Uttarakhand". *Indian J. Forest.* 33(2): 149–154.

Abstract: The paper describes the socio-economic conditions and some strategies to restrore the productivity of eight villages in Henvel watershed in the Tehri Garhwal Himalayas. The study reveals that the ratio of female to male population is more due to migration of males in search of livelihood to the other places. The average livestock varies from 4.43 to 5.40 per family and average land holding from 0.26 ha (Manjyar) to 1.52 ha (Jaul). Almost all the families in surveyed villages are engaged in farming and their average annual income per family per year is very low and varies from Rs. 4000/- to 6500/- per month. Fodder and fuel wood collection is done from the nearby forests, mainly by the women and children of the family and they spend 3 to 4 hours in these activities. Due to grazing of animals and collection of fodder and fuel wood, these activities cause environmental depletion. It is suggested that afforestation of village forest/community land through agroforestry models like silvipasture. Silvihorti system etc., can provide a key to the economic prosperity of the rural hills and would also be helpful in fulfilling the requirements of local inhabitants and ultimately balancing the whole ecology of the Grahwal Himalayas.

2631. **Kumar, R. & Bharati, K.A. 2012.** "Folk veterinary medicines in Jalaun district of Uttar Pradesh, India". *Indian J. Tradit. Knowl.* 11(2): 288–295.

Abstract: The aim of the present study is to document the prevalent folk medicinal knowledge of plants used for the treatment of various ailments of livestock in the district Jalaun of Uttar Pradesh. The study was carried out during February 2009 to April 2010 by taking interviews and discussions with the local inhabitants of the district. In total fifty seven plant species have been found to be used against twenty one ailments of livestock in the form of twenty-seven medicinal formulations. The comparative analysis between the previous studies conducted by several authors in India and the present study undertaken in Jalaun district revealed that out of fifty seven remedies reported here, fifty five remedies are found novel since they have been recorded first time.

2632. **Kumar, R. & Bharati, K.A. 2013.** "Folk veterinary medicines in the Bareilly district of Uttar Pradesh, India". *Indian J. Tradit. Knowl.* 12(1): 40–46.

Abstract: The aim of the study is to document folk medicinal knowledge prevalent for the treatment of ailments of livestock in the Bareilly district, Uttar Pradesh. Information on these veterinary practices was gathered by interviewing residents of the study area using the "Transect walks" method of the Participatory Rural Appraisal (PRA) technique from February 2009 to June 2010. The present study revealed that 42 plant species have been used by the local people to control various ailments of livestock prevalent in the study area. Apart from medicinal plants four animal/animal products and three mineral preparations have also been recorded, which are used in remedy preparation. These medicinal preparations have been used in the treatment of 28 livestock diseases. The most diversely used medicinal plants are Zingiber officinale, Plantago orbignyana, Acacia nilotica, Swertia chirayita and Piper nigrum. Comparison of the gathered data with the existing published literatures revealed that 28 plant species have been documented for the first time for animal use.

2633. **Kumar, R. & Kumari, B. 2017.** "Medicinal grasses resources from Sambhal district of Rohilkhand region UP, India". *Int. J. Appl. Pure Sci. & Agric.* 3(6): 56–60.

Abstract: Grasses are the members of Poaceae (Gramineae) family which are the most vital part in our life as food, medicine, cattle-fodder and many different things. Sambhal district is represented by 6 subfamilies and 14 tribes of family Poaceae. Subfamily Panicoideae (24 species) had the highest number of species followed by Chloridoideae (9 species), Pooideae (5 species) and Bambusoideae (1 species), Ehrhartoideae (1species), Arundinoideae (1 species) each, while Centothecoideae, Aristidoideae, Anomochlooideae, Danthonioideae, Pharoideae, and Puelioideae are not represented in this area. We recorded total 41 species out of which 18 grass species used in fungal infection, fever, haematuria, urinary diseases, intestinal worm, asthma, jaundice, cough, wounds, snakebite, rheumatism etc.

2634. **Kumar, R. & Kumari, B. 2019.** "Common grasses of Bijnor district used by bhoxa tribals in their primary health care system". *J. Med. Pl. Stud.* 7(3): 5–7.

Abstract: Within the wide diversity of flowering plants 'Grasses' are the one which can be found anywhere with great abundance. Grasses are the members of Poaceae (Gramineae) family which are the most vital part in our life as food, medicine, cattle-fodder and many different things. The Bhoxa tribals of Kotwali and Najibabad blocks use different parts of grasses in crude form as cure for many diseases. This paper deals with 23 grass species used in fungal infection, fever, cough, haematuria, urinary diseases, intestinal worm, wounds, snakebite, gonorrhoea etc. Present study reveals five subfamilies with their species namely Bambusoideae (3), Pooideae (2), Arundinoideae (1), Chloridoideae (3) and Panicoideae (14).

2635. **Kumar, R. & Singhal, V.K. 2019.** "Traditional knowledge and conservation status of some selected medicinal herbs from Uttarkashi district in Uttarakhand, Western Himalayas". *Taiwania* 64(1): 52–64.

Abstract: Traditional knowledge has been used throughout the world including India as a practice of using local herbal drugs. Majority of the locals living in the district Uttarkashi of Uttarakhand state have poor connectivity and socio-economic status. These people are known to have indigenous experience about the medicinal plants of the area and use their age-old experiences and perceptions in the treatment and prevention of various ailments. Present paper documents the ethnobotanical information and conservation status of 82 medicinal herbs from the hilly district of Uttarakhand. Information gathered include, local name, plant parts used, mode of preparations, medium of administration, ailments cured along with distribution and conservation status. Majority of these plants were used for their roots and leaves. Most of them are herbs while trees and climbers were less frequently used. People living in remote areas have a vast treasure of knowledge, but they do not disclose it easily to outsiders. During surveys and interactions, it has been noticed that due to over exploitation, some medicinal herbs are at the verge of extinction which need to be conserved at the earliest.

2636. **Kumar, S. & Narain, S. 2010.** "Herbal remedies of wetlands macrophytes in India". *Int. J. Pharma Bio Sci.* VI(2): 2010.

Abstract: Wetlands provide a unique habitat for several medicinal plants. In spite of their commercial value, the local community utilizes good number of these plants for various curative purposes. A number of these plants are very sensitive to the fluctuation in the normal physic-chemical parameter of the wetland. A slight alteration of the wetland may result in the disappearance or the extinction of these plants. This will ultimately result in large scale economic loss in terms of the medicinal product. Apart from the loss of plants, this will also result in the loss of local knowledge on the medicinal properties of these plants which very often can't be retrieved. Attempt has been made to document some of the little known medicinal properties of wetland plants used by local community of India.

2637. **Kumar, S. & Pandey, S. 2015.** "An ethnobotanical study of local plants and their medicinal importance in Tons river area, Dehradun, Uttarakhand". *Indian J. Trop. Biodiv.* 23(2): 227–231.

Abstract: Ethnobotanical study of plants with their medicinal importance was conducted between Januarys to June, 2013 in Tons river area, Dehradun to document the folklore knowledge of the local peoples. The aim of the study was to provide significant information on plants with uses, disease treated, and part of the plant used, methods of preparation, and methods of application among the local communities of the region. The data was collected using semi-structured interview and through questionnaire from respondents of different age class (27-80 years) in ten villages. The present work reports total of 49 plant species belonging to 30 families from the area. The majority of the documented plants were herbs (74%), followed by shrubs (16%) and trees (10%). The part of the plant most frequently used was the roots (34%), followed by leaves (26%), fruits (8%), seeds and whole plants (6%), rhizomes and flower (5%), stem and bark (3%), and oil and gum (1%). Powder and decoction was the most common preparation method use in treating recipes. The most frequently treated diseases in the region were fever, cold, cough, stomach problem, stomach worm, asthma, toothache, pain, swellings, ulcers, nerve tonic, infection, blood purifier, skin disease, blood pressure, diabetes, headache, jaundice, snake bite, renal stones, vomiting, urinary disorders, hair fall, diarrhea and itching.

2638. **Kumar, S. & Rohatgi, N. 1996.** "A note on some important medicinal plants of Garhwal Himalayas". *Ann. Forest.* 4(2): 175–185.

Abstract: Garhwal Himalayas in Uttar Pradesh provides a matchless wealth of medicinal plants due to varied climatic and edaphic conditions. About 70 per cent of plants used in preparing drugs for the indigenous system of pharmacology are available in

this region. The present paper deals with the studies on specific medicinal uses of some important plant species viz., *Aconitum heterophyllum, Adhatoda zeylanica, Centella asiatica, Jurinea dolomiaea, Solanum nigrum, Tinospora cordifolia* etc. to name a few.

2639. **Kumar, S. & Srivastava, N. 2002.** "Herbal research in Garhwal Himalaya: Retrospect and Prospect". *Ann. Forest.* 10(1): 99–118.

Abstract: The importance of plants in treating human ailments was known in India since ancient times. There are more than 600 established medicinal plants which find use in herbal drugs in a big way. Garhwal Himalayas has always been a centre of attraction as a rich source of medicinal plants. The present paper deals with past researches, present scenario and future strategies on herbal resources and their sustainable utilization in Garhwal Himalayas.

2640. **Kumar, S., Nagiyan, P. & Kumar, S. 2004.** "Studies on dye yielding plants of Uttaranchal". *Ann. Forest.* 12(1): 87–98.

Abstract: Uttaranchal is floristically one of the richest states of Himalaya having more than 4000 species of flowering plants. The vast floristic wealth of this state comprises a number of economic plants of which dye yielding plants have not received much attention for commercial exploitation so far. The present paper deals with about 80 dye yielding plant species of Uttaranchal and provides information on their botanical names, vernacular names, plant families, plant parts producing dye, colour of the dye and their phenology, etc.

2641. **Kumar, S., Singh, B.S. & Singh, R.B. 2017.** "Ethnomedicinal plants to cure diabetes and jaundice diseases among the rural and tribal peoples of Hathras district (U.P.)". *Int. J. Bot. Stud.* 2(2): 19–20.

Abstract: An ethnomedicinal studies was conducted in the Hathras district of Uttar Pradesh. The important information on the medicinal plants was obtained from the traditional medicinal peoples. Present investigations were carried out for the evaluation on the current status and survey on these medicinal plants. In the study we present 14 species of medicinal plants which are commonly used among the peoples of Hathras district (U.P.) to cure diabetes and jaundice diseases. This study is important to preserve the knowledge of medicinal plants used by the rural and tribal peoples of Hathras district (U.P.), the survey of psychopharmacological and literature of these medicinal plants has great pharmacological and ethnomedicinal significance.

2642. **Kumari, P., Joshi, G.C. & Tewari, L.M. 2012.** "Indigenous uses of threatened ethno-medicinal plants used to cure different diseases by ethnic people of Almora district of Western Himalaya". *Int. J. Ayurvedic & Herbal Med.* 2: 4.

Abstract: The present study is based on a field survey of the district of Almora, to find out the plants of medicinal values. The present study deals with the indigenous uses of *Taxus baccata* Linn., *Thalictrum foliolosum* DC., *Berberis aristata* DC., *Baliospermum montanum* Will., *Thymus serpyllum* Linn., *Coleus forskohli* Will., *Bergenia ciliata* (Haworth) Sternb., *Clerodendrum serratum* Linn., *Oroxylum indicum* Linn., *Valeriana hardwickii* Wall., *Valeriana jatamansii* Jones, *Celastrus paniculatus* Will., *Malaxis acuminata* D. Don, *Habenaria intermedia* D. Don., *Habenaria edgeworthii* Hook. f. ex Collett, *Costus*

speciosus (Koenig ex Retz.) Smith, *Dioscorea deltoidea* Wall., *Curculigo orchioides* Gaerth, *Gloriosa superba* Linn., *Polygonatum cirrhifolium* Wall. ex Royal., *Polygonatum verticillatum* Linn. Total fifty-two different diseases have been cured by the reported species. Out of fifty-two diseases, twenty-eight diseases (54%) cured by single plants, nine diseases cured by two (17%) species, seven diseases cured by three (14%), seven diseases cured by four (13%) species and one diseases cured by six (2%) species.

2643. **Kumari, P., Joshi, G.C. & Tewari, L.M. 2015.** "Taxonomical description, nativity and endemism with particular reference to threatened ethnomedicinal plants of Almora district of Western Himalaya". *J. Phytol.* 6: 14–25.

Abstract: Without taxonomy, one cannot gives shape to bricks and systematically tells how to put them together, and that's why the house of biological science is a meaningless jumble without it. Taxonomy is the foundation of the study of biodiversity. Most of these botanical explorations were aimed mainly at building the herbaria and writing the floristic account of the areas explored, but recent explorations seem to be putting emphasis on the nativity of threatened floras. The present manuscript deals the taxonomical description with nativity and endemism of threatened ethno-medicinal plant of Almora district of Uttarakhand.

2644. **Kumari, P., Singh, B.K., Joshi, G.C. & Tewari, L.M. 2009.** "Veterinary ethnomedicinal plants in Uttarakhand Himalayan region, India". *Ethnobot. Leafl.* 13: 1312–1327.

Abstract: Drug research has enriched human life in many ways. The health care and resulting social and economic benefits of new drugs to society are most remarkable, are quite well recognized. Drug research has been the driving force for many basic scientific developments, such as that of many new synthetic methods, of the understanding of the physiology and pharmacology of biological systems and has contributed much too molecular recognition. The Uttarakhand Himalayas have a great wealth of medicinal plants and traditional medicinal knowledge. The medicinal plant that has been widely used as veterinary ethno-medicine in Uttarakhand region has been studied. These do not either occur elsewhere or have not so far been exploited commercially. Attempts have been made to explore the new possible species having medicinal importance especially for veterinary and to grow them in suitable areas so as to meet national industrial demands. The present paper deals with the traditional uses of 100 plant species employed in ethno-medicine and ethno-veterinary practice in Uttarakhand.

2645. **Kumari, R. & Joshi, C. 2020.** "Phytochemical analysis of some selected herbal plants of Kanjabag region of Khatima, Udham Singh Nagar, Uttarakhand, India". *J. Med. Pl. Stud.* 8(2): 19–22.

Abstract: Medicinal plants are the local heritage with global heritage. Medicinal plants are known to produce certain bioactive molecules which inhibit bacterial and fungal growth. The aim of the present study was to investigate various phytochemical content of traditionally used medicinal plants of Kanjabag region of Khatima Tehsil. Four different plants were taken for analysis viz. *Alstonia scholaris, Carica papaya, Croton bonplandianus* and *Azadirachta indica*. It is found that flavonoid is present abundantly in all species. Saponins and tannins are also present in almost all species studied. It was concluded that plants studied were rich in phytochemicals with significant medicinal and pharmacological applications.

2646. **Kuniyal, C.P., Kuniyal, P.C., Butola, J.S. & Sundriyal, R.C. 2013.** "Trends in the marketing of some important medicinal plants in Uttarakhand, India". *Int. J. Biodiv. Sci., Ecosyst. Serv. & Manage.* 9(4): 324–329.

Abstract: Cultivation of threatened medicinal plants and sustainable harvesting of minor forest products is important for conservation of rare species and improvement of rural economies. An analysis of the trends in marketing of four medicinal plants, two cultivated (*Saussurea lappa* and *Picrorhiza kurrooa*) and two off-farm harvested medicinal plants (*Sapindus mukorossi* and *Cinnamomum tamala*), was conducted in Uttarakhand, India from 2007 to 2011. Data on volumes harvested and marketed was obtained from the Herbal Research and Development Institute and the Herbal Pharmaceutical Development Unit. Despite the low volume produced from the two cultivated species (on average 4.19 MT/year) compared to over 600.00 MT/year for the two off-farm species, they were marketed at better prices as compared to the off-farm harvested species: about 3.0 US$/kg as opposed to almost 0.50 $/kg. The total annual value of the cultivated species was almost 11.000 $/year and 290.000 US$ for the off-farm harvested species (based on sustainable use levels). In general, harvesting rates of all selected species increased in the years studied. The cultivated Saussurea lappa and Picrorhiza kurrooa are among the rare but globally significant medicinal plants, therefore, cultivation of these herbs is important for their conservation. Considerable quantities of *Sapindus mukorossi* and *Cinnamomum tamala* are marketed and these species seem to be pivotal for improvement of the rural economy. Little information is available on the policies for documentation of cultivation, sustainable harvesting, and trends in the marketing of medicinal plants from Indian Himalayan region (IHR). This communication is therefore important to understand the trends in the use of selected species in the Uttarakhand, IHR.

2647. **Kushwaha, A.K., Tewari, L.M. & Chaudhary, L.B. 2016.** "Etnobotanical uses of wild fruits of Sonbhadra district, Uttar Pradesh". *Ethnobotany* 28: 86–90.

Abstract: Ethnobotanical survey was conducted from 2010 to 2016 to document the uses of wild fruits found in Sonbhadra district of Uttar Pradesh. The data were collected through interviews and field observations with the help of local guides, villagers, medicine men and tribal person who had the traditional knowledge of plants. The present paper records the ethnobotanical uses of fruits of 29 species which are used in different forms for various purposes.

2648. **Lal, B. & Dube, V.P. 1984.** "Ethnobotanical studies on *Grewia optiva* Drum. ex Berret. among the Jaunsaris and the people of the adjoining areas of Tehri Garhwal, Uttar Pradesh". *Himal. Res. Develop.* 3: 6–8.

2649. **Lal, B., Dhasmana, H. & Nigam, B.K. 1989.** "A contribution to the medicinal plantlore of Garhwal region". *Himal. Res. Develop.* 8(1-2): 28–30.

2650. **Lata, K. & Singh, U. 2015.** "Herbal remedies for rheumatoid arthritis in Vindhyan region of Uttar Pradesh". *Phytotaxonomy* 15: 192–194.

Abstract: The present paper deals with 39 plant species belonging to 27 families employed ethno-medicinally in Vindhyan region of Uttar Pradesh by tribal and rural communities for treating rheumatoid arthritis. Ethnomedicinal plants are enumerated in alphabetical order along with families, local names, field number, method of preparation, mode of administration and doseregime.

2651. **Lata, S. 1996.** *Grewia optiva* Drumm. 'Bhimal': A boon for rural people in Kumaun Hills, India In: Jain, S.K. (Ed.), *Ethnobiology in Human Welfare*. Deep Publications, New Delhi. Pp. 471–472.

2652. **Lata, S. 1997.** "Indigenous knowledge about *Grewia optiva* in Indo-Nepal Himalaya". *Ethnobotany* 9: 112–116.

Abstract: *Grewia optiva* Drumm. ex Burret (Tiliaceae), an important multipurposes tree of Indo-Nepal Himalaya, is used for fodder, fibre, fuel, medicine and various other purposes. The present study was aimed at recording indigenous knowledge about this plant in Indo-Nepal Himalaya. Intensive field work was done in different areas, such as Surkhet, Salyan, Dang, Rolpa, Pyuthan, Kaski, Parbat, Lamjung, Gorkha, Kathmandu, Nuwakot, Saptri, Sunsari districts in Nepal and Almora and Nainital districts in India. Uses were recorded in field, from literature and also from herbarium specimens. During field work, some new uses were also noted.

2653. **Lata, S., Maurya, A.K. & Jain, S.K. 2008.** "An overview of ethnobotanical studies on Uttarakhand state in north India". *Ethnobotany* 20: 25–40.

Abstract: Uttarakhand state is largely mountainous. The paper provides a brief conspectus of ethnobotanical work done in this state in the alst about 50 years. Information is provided on ethnobotanical use-wise, district-wise and tribe-wise publications. As expected, large numbers of papers deals with ethnomedicine. Out of about 40 papers published on specific single tribe, the Bhotia tribe has received maximum attention. Major gaps in work are indicated. A bibliography of 248 references is appended.

2654. **Lepcha, S.T.S., Bahti, S. & Kumar, A. 2009.** *Common Fiber Yielding Plants of N.W. Himalaya with Special Reference to Uttarakhand*. Uttarakhand, Bamboo and Fibre Development Board, Dehradun.

2655. **Maheshwari, J.K. & Singh, H. 1988.** "Ethnobotanical observations on the Saharia tribe of Lalitpur district, Uttar radish". *Vanyajati* 36(3): 23–34.

2656. **Maheshwari, J.K. & Singh, H. 1990.** "Herbal remedies of Bhoxas of Nainital district, U.P.". *Aryaviaidan* 4: 30–34.

2657. **Maheshwari, J.K. & Singh, J.P. 1984a.** "Plants used in ethnomedicine by the Kols of Allahabad district, U.P." *Bull. Med.-Ethno-Bot. Res.* 5: 105–121.

2658. **Maheshwari, J.K. & Singh, J.P. 1984b.** "Contribution to the ethnobotany of Bhoxa tribe of Bijnor and Pauri Garhwal districts, U.P." *J. Econ. Taxon. Bot.* 5: 253–259.

Abstract: The paper deals with some plants of ethnobotanical importance used by the Bhoxa tribe inhabiting remote corners of Bijnor and Pauri districts of Uttar Pradesh. The Bhoxa village lies scattered in the midst of dense forest. Due to their constant association and dependence on forest for daily needs, they have learnt to utilise forest produce for food, fodder, fibre, medicine, contraceptives, pesticides, gums, resins, house-building materials, etc. Some of the important plants as food stuffs by the Bhoxas are: *Bombax ceiba* L., *Buchanania lanzen* Spreng., *Celosia argentea* L., *Commelina benghalensis* L., *Dioscorea belophylla* Voigt, *Portulaca oleracea* L., *Trianthema portulacastrum* L., *Zizyphus oenoplia* (L.) Mill. Etc. The species like *Adhatoda vasica* Medic., *Colebrookia oppositifolia* Sm., *Cuscuta reflexa* Roxb., *Leucas cephalotes* Spreng., *Mallotus philippensis* (Lamk.) Muell.-Arg., *Mirabilis jalapa* L., *Pogostemon bengalensis* (Burm.f.) O. Ktze., etc. are used for medicinal purpose, while *Saccharum benghalense* Retz., *S. Spontaneum* L. and *Vetiveria zizanioides* (L.) Nash etc. are used for house building materials.

2659. **Maheshwari, J.K. & Singh, J.P. 1985a.** "Plants used in magico-religious beliefs by the Kols of Uttar Pradesh. A study". *Folklore* 26(9): 170–173.

2660. **Maheshwari, J.K. & Singh, J.P. 1985b.** "Prospect of plant based cottage industries in the Kol tract of Uttar Pradesh". *Vanyajati* 33(2): 33–36.

2661. **Maheshwari, J.K. & Singh, J.P. 1987.** "Traditional Phytotherapy amongst the Kol tribe of Banda district, Uttar Pradesh". *J. Econ. Taxon. Bot.* 9(1): 165–171.

Abstract: The paper presents an inventory of medicinl plants, together with first-hand information on the traditional system of medicine amongst the Kols of Banda district, Uttar Pradesh. Some of the important medicinal plants used by them are: *Acacia leucophloea* Willd., *Boerhavia diffusa* Linn. (abortion), *Aristolochia indica* Linn., *Fumeria indica* Pugsley, *Nyctanthes arbor-tristis* Linn. (fever), *Centipeda minima* (L.) A. Br. (headache), *Cynodon dactylon* Linn. (dysentery), *Helicteres isora* Linn. (stomachache), *Lannea coromandelina* (Houtt.) Merr. (cuts), *Marsdenia tenacissima* Moon (asthma), *Selaginella bryopteris* Bak. (spermatorrhoea) and *Ventilago denticulate* Willd. (eye inflammation), etc. These have been recorded as part of the heritage of the tribal people, for scientific interest and use in ethnopharmacological research. The present study has revealed that the present resources of Banda district are quite rich for the herbal drug industry. The drug collection centres and processing units should be established in tribal areas for bulk collection of herbs and their utilization in indigenous systems of medicine.

2662. **Maheshwari, J.K., Singh, K.K. & Saha, S. 1980.** "Ethnomedicinal uses of plants by the Tharus of Kheri district, Uttar Pradesh". *Bull. Med.-Ethno-Bot. Res.* 1(3): 318–337.

2663. **Maheshwari, J.K., Singh, K.K. & Saha, S. 1981a.** *The Ethnobotany of the Tharus of Kheri district, Uttar Pradesh.* Economic Botany Information Service, National Botanical Research Institute, Lucknow. Pp. 1–48.

2664. **Maheshwari, J.K., Singh, K.K. & Saha, S. 1981b.** "The Ethnomedicinal uses of plants by the Tharus of Kheri district, Uttar Pradesh". *Bull. Med.-Ethno-Bot. Res.* 1(3): 318–337.

2665. **Maheshwari, J.K., Singh, K.K. & Saha, S. 1986.** *Ethnobotany of tribals of Mirzapur district, Uttar Pradesh.* Economic Botany Information Service. National Botanical Research Institute, Lucknow. Pp. 1–38.

2666. **Maikhuri, R.K., Nautiyal, M.C. & Khali, M.P. 1991.** "Lesser known crops of food value in Garhwal Himlaya and a strategy to conserve them". *FAO/IBPGR Pl. Genet. Resources Newsletter* 86: 33–36.

Abstract: This article describes the area under cultivation to these crops and examines their ethnobotany and approaches to conserving them.

2667. **Maikhuri, R.K., Nautiyal, S. & Rao, K.S. 1998.** Medicinal plant cultivation practices of Bhotias in Nanda Devi Biosphere Reserve villages of Garhwal Himalayas. In: Samant, S.S., Dhar, U. & Palni, L.M.S. (Eds.), *Himalayan Medicinal Plants: Potential and Prospects*. Gyanodaya Prakashan, Nainital. Pp. 317–328.

2668. **Maikhuri, R.K., Nautiyal, S., Rao, K.S. & Saxena, K.G 1997.** "Medicinal plant cultivation and Biosphere Reserve management. A case study from the Nanda Devi Biosphere Reserve, Himalaya". *Curr. Sci.* 74(2): 157–163.

Abstract: Conservation-induced natural resource management options are of significance for effective management of biosphere reserves where people reserve conflicts are the prime attention of management plans. Nanda Devi Biosphere Reserve (NDBR) in Garhwal Himalaya is one such area where existing conflicts drew researchers' attention on management of natural resources. The cultivation of medicinal plants existing in this area has become a major activity with conservation-oriented land use changes. We describe here the agronomic practice and uses of eight medicinal and aromatic plants cultivated in the NDBR buffer zone villages of Garhwal Himalaya. The efficiency of resource use and economic returns indicate how such low-volume, high value crops which were suggested for this region have not only the potential for economic betterment of people of this area but also help the cause of conservation in this biosphere reserve.

2669. **Maikhuri, R.K., Nautiyal, S., Rao, K.S. & Saxena, K.G. 1998.** "Role of medicinal plants in the traditional health care system: A case study from Nanda Devi Biosphere Reserve". *Curr. Sci.* 75(2): 152–157.

Abstract: Tolchha-Bhotiya sub-community, inhabiting the buffer zone villages of Nanda Devi Biosphere Reserve, has strong faith and belief in traditional health care system, viz. herbal treatment. Twenty-five plant species are generally being used along with other materials and plant products in different combinations to cure fifteen major diseases. About eight and nine plant species are used for curing more than one disease. However, for some rare and serious diseases like tuberculosis, rheumatism, internal wounds and fractures, a few people, particularly those belonging to higher income group, prefer allopathic treatment. Since the knowledge of various medicinal plants being used in herbal treatment and their method of use is confined to local practitioner-vaidhya- it is of utmost importance to record this knowledge for future generations, otherwise it will be lost forever in the process of acculturation, which is taking place in the community at an alarming rate.

2670. **Maikhuri, R.K., Nautiyal, S., Rao, K.S. & Semwal, R.L. 2000.** "Indigenous knowledge of medicinal plants and wild edibles among three tribal sub communities of the Central Himalayas, India". *Indigenous Knowl. Develop. Monitor.* 8(2): 7–13.

Abstract: The Bhotiyas of the Central Himalayas, who practice migratory cattle-raising and traditional agriculture, are highly dependent on the resources which they find in nature. The present article, which is based on years of research among three subcommunities of the Bhotiyas, documents their knowledge of medicinal plants and

wild edibles, and the specific manner in which they are used. This information is presented in three tables. The article ends with a discussion of the need to conserve this knowledge in the light of the rapid acculturation now taking place within the Tolchha, Marchha and Jadh subcommunities.

2671. **Maikhuri, R.K., Phondani, P.C., Rao, K.S., Semwal, R.L., Kandari, L.S., Chauhan, K., Rawat, L.S., Dhyani, D. & Saxena, K.G. 2010.** Ethnobiology and traditional knowledge of medicinal plants in health care system. In: Uniyal, P.L., Chamola, B.P. & Semwal, D.P. (Eds.), *The Plant Wealth of Uttarakhand.* Jagadambica Publishing Co., New Delhi. Pp. 369–380.

2672. **Malhotra, C.L. & Balodi, B. 1984a.** "Wild medicinal plants in the use of Johari tribals". *J. Econ. Taxon. Bot.* 5: 841–843.

Abstract: The short note deals with 14 wild plant species commonly used by the Johari tribals of Munsiari tehsil of Pithoragarh district of Kumaon.

2673. **Malhotra, C.L. & Basu, D. 1984b.** "A preliminary survey of plant resources of medicinal and aromatic value from Almora". *J. Econ. Taxon. Bot.* 5(4): 859–864.

Abstract: A preliminary survey from Almora has reveaed prospective plant wealth which needs exploitation and development. The number of such species growing in nature in the district is very large. Many of them have been used as well known drugs for therapeutic purposes or for essential oils. The area requires extensive survey, large scale cultivation, improvement of better varieties and also germplasm bank. Monitoring of these aspects are highly desirable for exploring the wild resources.

2674. **Malik, V., Mohammad, I. & Pranita. 2010.** "Glitter of plant diversity in the sacred grove of Karar, Mujaffarnagar (U.P.)". *Indian J. Forest.* 33(3): 337–342.

Abstract: Sacred groves are spiritually charged and holy places having patches of vegetation in its climax state and which have been protected by local people on socio-religious grounds. In real sense sacred groves are the oldest existing form what was known as ancient botanical garden. The present paper deals with the Glitter of plant diversity in the sacred grove of Kharar, district Muzaffarnagar (U.P.); for, to the best of the knowledge of the investigator, the road leading to this arena is untrodden. The study records 120 angiosperms belonging to 45 families.

2675. **Malik, Z.A., Bhat, J.A., Ballabha, R., Bussmann, R.W. & Bhatt, A.B. 2015.** "Ethnomedicinal plants traditionally used in health care practices by inhabitants of Western Himalaya". *J. Ethnopharmacol.* 172: 133–144.

Abstract: Inspite of tremendous advances made in allopathic medicine, herbal practice still plays an important role in management and curing various ailments in remote and rural areas of India. However, traditional knowledge on the use of medicinal plants is eroding day by day and there is a need to document such knowledge, before it is lost forever. The aim of the present study was to document the indigenous and traditional knowledge of medicinal plants used by local inhabitants in and around Kedarnath Wildlife Sanctuary of Indian Himalaya for the advancement of biomedical research and development. A total of 97 medicinal plant species belonging to 52 families and 83 genera were reported for curing various ailments like fever, cough, cold, digestive disorders, constipation, menstrual disorders etc. Out of 97 plant species

reported, 21 are rare or threatened. Literature review revealed that 11 out of the 97 plant species are reported with new therapeutic uses. The most frequently utilized plant part was the root/rhizome (33%) followed by leaf (27%). In some cases whole plant was utilized. A few medicinal plants had some veterinary uses also.

2676. **Maliya, S.D. 2004.** "Some new or less known folk medicines of district Bahraich, Uttar Pradesh, India- II". *Ethnobotany* 16: 113–115.

2677. **Maliya, S.D. 2007.** "Traditional fruit and leaf therapy among Tharus and indigenous people of district Bahraich, India". *Ethnobotany* 19: 131–133.

Abstract: The paper deals with some traditional ethnomedicinal uses of 20 plant species recorded in the forests and nearby areas adjacent to Wildlife Sanctuary Katarniyaghat in Bahraich. Tharus and the local people of this region use fruits and leaves, traditionally, either singly or in combination to prepare poly-herbal drugs for treating various ailments.

2678. **Maliya, S.D. 2009a.** "Ethnomedicinal practices among tribals and indigenous people of Shravasti and Bahraich district (UP)". *Ethnobotany* 20: 121–123.

Abstract: The paper highlights some less known ethnomedicinal practices relating to 15 plant species occurring in Shravasti and Bahraich districts. Tribals and indigenous people of these districts prepare polyherbal drugs either singly or in combination with other plant species. They have been using such preparations for a long time for human healthcare.

2679. **Maliya, S.D. 2009b.** "Supplementary food plants of tribals of wildlife Sanctuary Katarniyaghat region, district Bahraich districts, Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 33(2): 328–332.

Abstract: Present study highlights the traditional uses of 40 edible plant species belonging to 21 families and 37 genera of Wildlife Sanctuary, Katarniyaghat region of Bahraich district. Tribals (Tharus) of the sanctuary area traditionally use the needed parts of these plant species as supplementary food. They believe that these plants are the cheap and best sources of nutrition.

2680. **Maliya, S.D. 2009c.** "Traditional uses of some plants in folk medicines on Indo-Nepal border". *J. Econ. Taxon. Bot.* 33(Suppl.): 30–33.

Abstract: The paper highlights traditional uses of seventeen indigenous plant species. Aboriginals of Indo-Nepal border area located on north-west limits of Bahraich district exploit these plant species either singly or in combination to prepare polyherbal drugs for treating various human complaints and ailments.

2681. **Maliya, S.D. 2009d.** "Traditional uses of some folkmedicines among Tharus of Katarniyaghat Wildlife Sanctuary region of district of Bahraich, Uttar Pradesh". *J. Econ. Taxon. Bot.* 33(suppl.): 220–223.

Abstract: Paper present highlights some traditional ethnomedicinal uses of sixteen species among Tharus and local inhabitants of Bahraich district. They use these plants either singly or in the combination of other plants or their parts. These plant species are traditionally used for various diseases, ailments and common complaints to human welfare and healthcare.

2682. **Maliya, S.D. 2009e.** "Diversity assessment of folkmedicines of Kheri and Bahraich districts, Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 33(Suppl.): 224–230.

Abstract: The paper highlights the diversity of ethnomedicinal uses of 41 species among tribals of two adjacent districts of Kheri and Bahraich. The study is based on comparison of uses of the same plant or the plant parts in different diseases, ailments and other complaints by the Tharus (tribals) and local people of these two districts. They use these species to cure several other problems with their traditional and indigenous recipes.

2683. **Maliya, S.D. 2011a.** "New or less-known uses of some ethnomedicinal plants of Wildlife Sanctuary Katarniaghat of Bahraich, Uttar Pradesh". *J. Econ. Taxon. Bot.* 35(1): 35–38.

Abstract: Present paper highlights new or less-known ethnomedicinal uses of abut seventeen plant species used by tribals and local people of Katarniyaghat Sanctuary area for their health-care. They collect these plants and prepare herbal medicines/ drugs following indigenous methods. To prepare the medicine, they use either a single plant or the other plant parts. Ometimes they combine several plants to prepare a required recipe. Indigenously prepared poly-herbal medicines are generally used by Tharus tribals and local people of this area to treat various diseases and other health problems.

2684. **Maliya, S.D. 2011b.** "Ethnobotanical significance of the flora of Katarniyaghat Wildlife Sanctuary, district Bahraich, Uttar Pradesh". *J. Econ. Taxon. Bot.* 35(1): 39–55.

Abstract: Present paper deals with ethnobotanical significance of about 258 species recorded in Wildlife Sanctuary, Katarniyaghat of district Baharaich. About 148 species have been collected which are medicinally used by the tribals and local people of this sanctuary area. These species are generally preferred and utilised by the inhabitants as medicine against various diseases and health problems. Some other plants are commonly used by them for domestic furnitures, shelter, fuel, fodder, food, fences and thatching, etc. A brief account of ethnobotanical significance of these species is summarised in tabular form in the paper.

2685. **Maliya, S.D. & Singh, K.K. 2003.** "Some new or less-known folk medicines of Bahraich district, Uttar Pradesh". *Ethnobotany* 15: 132–135.

Abstract: The paper deals with some new or less known ethnomedicinal uses of 20 plant species utilized by Tharu tribe and other rural inhabitants of Nishangara, Katarniyaghat and Murtiha forest ranges in Bahraich district. The species enumerated are used by them in their day-to-day life and healthcare. They utilize either single plant or in combination for preparation of polyherbal medicines for treating various ailments.

2686. **Mamgain, S.K. & Rao, R.R. 1990.** "Some medicinal plants of Pauri Garhwal Himalaya". *J. Econ. Taxon. Bot.* 14(3): 633–640.

Abstract: The present paper lists 41 medicinal plants of Pauri Garhwal Himalaya with their medicinal uses and mode of application, following ethnobotanical approaches. For each species the correct nomenclature, brief description and uses are mentioned. Local names (Garhwali or Hindi) are also mentioned. Reports on chemical analysis where known are also mentioned at the end of each species.

2687. **Manikandan, R., Srivastava, S.K. & Deroliya, P.K. 2014.** "Economically important plants from Govind Pashu Vihar Wildlife Sanctuary, Western Himalaya". *Ann. Forest.* 22(1): 57–75.

Abstract: The present paper deals with economically important plants, especially wild edibles (leafy vegetables, fruits), pseudo-cereals, medicinal plants, herbal source of vegetable oils, paper and pulp, beverage, spices, condiments and flavouring agents, gums and resins, etc. in details from Govind Pashu Vihar Wildlife Sanctuary, Uttarakhand.

2688. **Mathela, C.S. & Pant, A.K. 1992.** "Aromatic grasses of U.P. hills". *Uttarakhand 6:* 91–95.

2689. **Mathela, C.S., Kharkwal, H.B. & Joshi, D.N. 1979.** "Medicinal flora of Pithoragarh district of Uttar Pradesh". *Indian Drug Pharmac. Indust.* (Jul-Aug.): 1–6.

2690. **Mathela, C.S., Melkani, A.B., Joshi, P., Mathela, D.K., Pant, A.K. & Dev, V. 1987.** "Aromatic grasses of Kumaun Himalaya: Distribution, chemotaxonomy, nutritive value and economic importance". *J. Econ. Taxon. Bot.* 11(2): 337–343.

Abstract: Aromatic grasses constitutes only a part of the grass cover of the Kumaun Himalaya (N.W. Himalaya). An attempt has been made to report the distribution of the six common aromatic grasses growing at different altitudes (200 to 250 m) and climatic conditions. The variation in the herbage and their essential oil yields, their chemical compositions and chemotaxonomic significance have also been summarised. The *Cymbopogon distans* collected from two different places and identified on the basis of their taxonomy have been found to possess altogether different chemical composition of their essential oils. These species bearing no chemical relation in their oils are being reported as the two different chemotypes of C *distans* (" oxobisabolene type and citral type). The C. *jwarancusa* which is otherwise known for its piperitone content, has monoterpene alcohols (52%) while piperitone is one of the minor constituents. The oil from the roots of this plant is dominated by monoterpene hydrocarbons and sesquiterpene alcohols. The essential oils of C. *stracheyi* and C. *flexuosus* (cultivated) have iperitone (438%) and citral (65%) as principal constituents, respectively. The oils from C. *martini* and *Bothriochloa bladhi* possess monoterpene alcohols and acorenone (26%) as the major constituents, respectively. The nutritive value, economic potential and further extension of cultivation of the grasses in the hilly terrain have been emphasized.

2691. **Mathur, A. & Joshi, H. 2012.** "Traditional remedies in Tarai region of Kumaun, Uttarakhand". *Indian J. Tradit. Knowl.* 11(4): 652–657.

Abstract: A floristic survey of ethnomedicinal plants was conducted in the Tarai region of Kumaun, Uttarakhand. The study was conducted during 2008 to 2011 to assess the traditional uses of plant resources of this area. The study area was divided in three sites and eight communities and the study was conducted through extensive and intensive explorations during different seasons (i.e., summer, rainy, winter and spring) of the year. A total of 41 Angiospermic plants species belonging to 27 families being used for traditional remedies are reported. Details of plant parts, methods of preparation and mode of utilization are also presented. The information on traditional

knowledge was gathered through exhaustive interviews with local people as well as migrants of distant places of different gender and class settled in the area. Although people of Tarai region used these plant species for 45 traditional remedies for a long time on trial and error basis, further research and scientific examination is recommended for these traditional remedies.

2692. **Mathur, A. & Joshi, H. 2014a.** "Some ornamental plant species of Tarai region of Kumaun, Uttarakhand". *Indian J. Forest.* 37(2): 207–212.

Abstract: The present study was conducted in the central terai region of Kumaun, Uttarakhand in the year 2008-2011. The study area located in Lalkuan, Kichha and Pantnagar. Sixty three ornamental plant species were found during the study period which is also used as utilitarian. The number of plant species which was introduced from the other native places aws 47. Ornamental plants play important roles in society, religion and science.

2693. **Mathur, A. & Joshi, H. 2014b.** "Species diversity and ethnobotanical uses grass and sedge species of *Tarai* region of Kumaun, Uttarakhand". *J. Non-Timber Forest Prod.* 21(3): 167–174.

Abstract: The study of species diversity and ethnobotanical uses of grass and sedge species was conducted during 2008-2011 in the *tarai* region of Kumaun. The study area is located in Lalkuan of Nainital district and Kichha tehsil covering Pantnagar in district Udhamsingh Nagar as they occupy main part of central *tarai* region. The entire study area was divided into three sites and eight communities. The plant species were collected seasonally i.e. summer, rainy and winter. Total 41 grass and 17 sedge species were collected during the study period and 35 grass and 4 sedge species were found of ethnobotanical importance. Their ethnobotanical uses were identified through oral communication with local as well as migrant people settled in the region. It was found during study period that climate was favourable for the growth of grass and sedge.

2694. **Mathur, A. & Joshi, H. 2015a.** "Important timber (wood) plant species found in Tarai region of Kumaun, Uttarakhand". *Indian J. Forest.* 38(3): 227–230.

Abstract: The paper enumerates 57 species of important timber yielding plants collected from Terai region, Uttarakhand.

2695. **Mathur, A. & Joshi, H. 2015b.** "Some plant species of Tarai region of Kumaun, Uttarakhand, used in tuberculosis". *J. Non-Timber Forest Prod.* 22(4): 235–37.

Abstract: Tuberculosis (TB) remains one of the most difficult ailments to control in the world today. The emergence of drug resistant strains has made previously effective and affordable remedies less effective (there are more than twenty drugs that are currently used for the treatment of TB and almost all of them were developed some years ago. The drugs are used in differing combinations in different circumstances, so that for example some TB drugs are only used for the treatment of new patients who are very unlikely to have resistance to any of the TB drugs). This has made the search for new medicines from local traditional medicines. The specific objectives of this study were to identify plant species used in the treatment of TB, parts used, their methods of preparation and administration. The present study was conducted in the

central tarai region of Kumaun, Uttarakhand in the year 2008-2011. Total fifteen plant species were found to be used to cure tuberculosis. The different use of *Adhatoda vasica* was reported first time from the study area. Species *Albizia lebbeck*, *Bauhinia variegata*, *Baliospermum montanum*, *Sida rhombifolia*, *Withania somnifera*, *Asclepias curassavica*, *Echinops echinatus* and *Saccharum spontaneum* were reported first time of the study area.

2696. **Mathur, A. & Joshi, H. 2016a.** "Traditional remedies used by migrant and local people in fever by plant species of Tarai region of Kumaun, Uttarakhand". *Indian J. Tradit. Knowl.* 15(3): 519–523.

Abstract: There are a number of medicinal herbs that have a long history of use as a natural treatment for fever, as well as traditional herbal combinations that are pleasant to the taste and provide a number of benefits when suffering from fever and chills. In holistic tradition, herbs are not used to reduce fever unless there is also some positive benefit in treating the infection or inflammation that is causing the fever. Many practitioners see fever as the body's natural response to a pathogen. Fever has been shown to stimulate immune system production of antibodies and may also enhance the body's elimination of toxins. If a fever is suppressed, the individual loses the advantages from the body's natural defense system, and the illness may last longer. Therefore, herbalists try to use herbs that support the immune system and enhance other cleansing processes of the body. The present study had been conducted in tarai region in the year 2008 to 2011 in three sites and eight communities. Total 29 plant species were identified to cure fever. These plant species were used in different type of fever as in typhoid, tertian and in malarial fever. *Datura alba, Allium cepa* and *Capscicum annum* were reported first time from the study area.

2697. **Mathur, A. & Joshi, H. 2016b.** "Comparative study of ethnobotany of Tarai region of Kumaun, Uttarakhand with other regions of India and Nepal". *J. Non-Timber Forest Prod.* 23(2): 117–122.

Abstract: The ethnobotanical study was conducted between the years 2008 to 2011 in tarai region of Kumaun, Uttarakhand. The paper shows that how different communities uses the same plant species differently due to their indigenous knowledge. In the present paper 22 plant species selected which are widely used in tarai region.

2698. **Mehrotra, B.N. 1979.** "A survey of medicinal plants around Kedarnath shrine of Garhwal Himalayas". *Indian Forester* 105(11): 788–804.

Abstract: A survey of medicinal plants growing in and around the holy shrine of Kedarnath has been undertaken. The present paper describes 68 medicinal plants found growing in the area ranging in altitude between 2700 m and 4200 m with two alpine lakes. Suggestions have also been made for the protection of the natura wealth from indiscriminate exploitation.

2699. **Mehta, I.S., Joshi, G.C. & Basera, P.S. 1994.** The folklore medicinal plants of Talla Johar of Eastern Kumaun (Central Himalaya). In: Gupta, B.K., (Ed.). Higher Plants of Indian Subcontinents [*Indian J. Forest.,* Addl. Ser.] 3: 125–133. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: Fifty five spceies (53 angiosperms and 2 gymnopserms) of medicinal plants have been reported from Tolla Johar, Pithoragarh district of Kumaun Himalaya which is used by the remote people for their medical and surgical treatment.

2700. **Mehta, P.S. & Bhatt, K.C. 2007.** "Traditional soap and detergent yielding plants of Uttaranchal". *Indian J. Tradit. Knowl.* 6(2): 279–284.

Abstract: Transmission of traditional knowledge from one generation to another is a vital tool for assessing the evolution of human civilization. Rural communities, particularly in the hilly areas have developed various techniques for utilization of plants according to their needs. There are a number of plant species used as soap and detergent in the hilly areas, where access to market is not possible. Now, due to change in socioeconomic and cultural conditions of these communities, they have abandoned the traditional use of plant species. Consequently, the existing traditional knowledge in respect to plant uses has disappeared. In view of this, an attempt has been made to document the plant species used as soap and detergent in Uttaranchal and local processing techniques with an aim to preserve the centuries old traditions of the society.

2701. **Mehta, P.S., Kumar, D. & Bhatt, K.C. 2006.** "Wild edible plant species for subsistence in Kumaun Himalaya and associated traditional knowledge". *J. Econ. Taxon. Bot.* 30(Suppl.): 340–352.

Abstract: People living in remote localities have gained adequate knowledge about their surrounding environment and availability of resources. Most of them are unknown to the researchers and urban people. Many plant species used by rural communities to fulfil their requirements have already disappeared and many more are waiting for the same fate because of over-exploitation. Due to increase in literacy percentage, urbanization, deforestation, migration of rural people for seeking off jobs, their very knowledge with respect to wild edible plant species is disappearing at alarming rate. Hence, there is a need to tap such valuable information for future generations. Keeping this in view, an attempt has been made to document the wild edible plant speces which are consumed as fruits and vegetables by the rural communities in Kumaun hills of Uttaranchal. The socio-economic and cultural importance of these plant species are also discussed in the present communication.

2702. **Mehta, P.S., Negi, K.S. & Ojha, S.N. 2010.** "Native plant genetic resources and traditional foods of Uttarakhand Himalaya for sustainable food security and livelihood". *Indian J. Nat. Prod. & Resources* 1(1): 89–96.

Abstract: In view of changing of food habits of local communities of Uttarakhand Himalaya, a study to document the native plant genetic resources of food importance and traditional recipes was conducted. Both cultivated and wild edible plant species were documented through scheduled interviews. With the help of respondents the questionnaires were filled up. After conducting the survey in the whole Uttarakhand state the plant species of food importance were identified and a large number of traditional food items were enumerated. The relationship between plant species of food importance and sustainable livelihood was also discussed.

2703. **Mehta, P.S., Sharma, A.K. & Negi, K.S. 2010.** "Indigenous Knowledge System and sustainable development with particular reference to folklores of Kumaon Himalaya, Uttarakhand". *Indian J. Tradit. Knowl.* 9(3): 547–550.

Abstract: Agriculture and allied activities are the prime source of subsistence in Kumaon Himalaya, Uttarakhand. Indigenous knowledge accumulated by the farmers by observation, experimentation, trial and error method is the basic input in addition to seeds and farm yard manure. Farming communities of the region have gained the knowledge from their ancestors. The knowledge accumulated by them has been coined in the form of idioms and phrases in the region are known as folklores. The folklores, which have been vouging in the region, impart the knowledge for subsistence. In the paper, attempt has been made to elaborate the indigenous knowledge pertaining to agricultural operations, environment, conservation and sustainable development and discussed them in the light of western science.

2704. **Mehta, P.S., Negi, K.S., Rathi, R.S. & Ojha, S.N. 2012.** "Indigenous methods of seed conservation and protection in Uttarakhand Himalaya". *Indian J. Tradit. Knowl.* 11(2): 279–282.

Abstract: In Uttarakhand Himalaya traditional agriculture is the mere way to meet the subsistence needs of the local farming communities. In traditional system of agriculture, local seed material of traditional crop varieties plays an important role for crop production. In such a situation, the protection of seed material and its conservation for future needs is also of very paramount importance. In order to protect the seed material and food grains, local practices by using indigenous plant material and other articles are very useful, eco-friendly and sustainable. In the present study, the investigators have surveyed the entire Uttarakhand Himalaya for documenting the indigenous seed and grain protection practices of the farm households. The indigenous practices are discussed here in the light of Western science. The present investigation was undertaken with the aim of objectives to provide protection to the knowledge of local farmers and document it before it's lost under the onslaught of development. Another important objective was to pave the way for values addition in the indigenous knowledge by the scientists, researchers and development workers for sustainable development.

2705. **Misra, S., Maikhuri, R.K., Kala, C.P., Rao, K.S. & Saxena, K.G. 2008.** "Wild leafy vegetables: A study of their subsistence dietetic support to the inhabitants of Nanda Devi Biosphere Reserve, India". *J. Ethnobiol. & Ethnomed.* 4: 15–23.

Abstract: Consumption of greens is a major source of vitamins and micro-nutrients for people using only vegetarian diets rich in carbohydrates. In remote rural settlements where vegetable cultivation is not practiced and market supplies are not organized, local inhabitants depend on indigenous vegetables, both cultivated in kitchen gardens and wild, for enriching the diversity of food. Knowledge of such foods is part of traditional knowledge which is largely transmitted through participation of individuals of households. A total of 123 households in six villages of Nanda Devi Biosphere Reserve buffer zone was surveyed using a schedule to assess the knowledge, availability and consumption pattern of wild leafy vegetables. Quantity estimations were done using regular visits with informants from 30 sample households of the six study villages during the collections. Monetization was used to see the value of wild leafy vegetables harvested during a year. The diversity of wild leafy vegetables being use by the local inhabitants is 21 species belonging to 14 genera and 11 families. This is far less than that being reported to be used by the communities from Western Ghats in India and some parts of Africa. Irrespective of social or economic status all households in the study villages had the knowledge and used wild leafy vegetables. The number of households reported to consume these wild leafy vegetables is greater than the number of households reporting to harvest them for all species except for *Diplazium esculentum* and *Phytolacca acinosa*. The availability and use period varied for the species are listed by the users. The study indicated that the knowledge is eroding due to changing social values and non participation of younger generation in collection and processing of such wild leafy vegetables.

2706. **Mohammad, I., Malik, V. & Pranita. 2010.** "Ethnomedicinal plants of Shakumbari Devi region of district Saharanpur (U.P.)". *J. Non-Timber Forest Prod.* 17(2): 187–195.

Abstract: This paper provides information on 50 medicinal plants belonging to 32 families used by the villagers and local people for curing various diseases of animals and human beings. Some of the important plants used for this purpose are *Hygrophila*, *Anisomeles*, *Vitis*, *Ficus*, *Trichosanthes*, *Ammannia*, *Linum*, *Sida*, *Caesalpinia*, *Moniera*, *Spilanthes*, *Teramnus*, *Celastrus*, etc. The use of traditional medicinal plants for curing various diseases was observed to be widespread and prevalent in this area.

2707. **Mohammad, I., Malik, V. & Pranita. 2011.** "Enumeration of ethnomedicinal plants of Shakumbari Devi region of district Saharanpur (U.P.)". *J. Econ. Taxon. Bot.* 35(4): 837–845.

Abstract: This paper provides information on 50 medicinal plants belonging to 32 families used by the villages and local people for curing various diseases of animals and human beings. Some of the important plants used for this purpose are *Hygrophila, Anisomeles, Vitis, Ficus, Trichosanthes, Ammannia, linum, Sida, Caesalpinia, Bacopa, Spilanthes, Teramnus, Celastrus,* etc. The use of traditional medicinal plants for curing various diseases was observed to be widespread and prevalent in this area.

2708. **Monika, Mishra, D., Bisht, P.S. & Chaturvedi, P. 2020.** "Medicinal use of traditionally used plants in Bhatwari block, district Uttarkashi, Uttarakhand, India". *J. Scientif. Res.* 64(1): 119–126.

Abstract: The prolific plant diversity of Uttarakhand hills has provided an initial lead to the local people to look for various plant species for the purpose of food, medicine, spices and perfumes. Over the period of time, they have compiled the knowledge on the use of various plant species. The present study aims to document such information, especially the use of plants for medicine, as spice and as perfumes. Field surveys carried out in the villages of Bhatwari block have resulted in the documentation of 60 medicinal, aromatic and spice plant species. These species were distributed over various life forms, like tree, shrub and herbaceous forms. For curing various ailments, the use of aboveground plant parts was relatively higher than the belowground parts. Different belowground plant forms such as root, bulb, tuber and rhizome were used for preparing herbal medicines. About 15% of these species, which include *Aconitum heterophyllum* Wall. ex Royle, *Rheum australe* D. Don, *Nordostachys jatamansi* (D.Don) DC., *Podophyllum hexandrum* Royle, *Taxus baccata* L. and *Angelica glauca* Edgew. have become threatened due to over exploitation, natural and anthropogenic pressures. Conservation and sustainable utilization of these valuable medicinal plant species is essential to protect the traditional knowledge regarding plants and plant based healing practices.

2709. **Mukherjee, A., Joshi, K., Pal, R.S., Atheequlla, G.A., Roy, M.K. & Chandra, N. 2018.** "Scientific health benefits of Namakeen Chai/Jya (salted tea): A traditional tea beverage of Bhotiya tribal community in higher altitudes of Uttarakhand". *Indian J. Tradit. Knowl.* 17(2): 365–369.

Abstract: Bhotiya is a primitive tribal community in the high altitude hills of central Himalaya. The community is globally well known for its ethnic knowledge. They have the old tradition of preparing beverage "Namkeen chai" or "Jya" (salted tea) which is considered incredibly energetic and nutritive for health. The beverage is prepared by using the Taxus baccata L. bark, milk, ghee, and salt. It has a noteworthy role in depicting the socio-economic and cultural life of Bhotiya tribe of Uttarakhand. Biochemical analysis of the Taxus baccata bark was done to determine total phenolic content, total flavonoids and anti-oxidative properties. This paper deals with the documentation of procedure for preparing "Namkeen chai" by the Bhotiya tribal community and its scientific health benefits.

2710. **Nagiyan, P., Dhiman, A.K. & Bhargava, A.K. 2003.** "Medicinal value of gum and resin secreting plants of district Saharanpur". *Ann. Forest.* 11(2): 245–248.

Abstract: The present paper deals with some important gum and resin secreting plants of district Saharanpur (Uttar Pradesh) and provides information on botanical and vernacular names, flowering and fruiting period and hitherto unknown medicinal uses of these species.

2711. **Naithani, B.P. 1973.** "Medicinal plants of western Garhwal". *Khadi Gramodyog* 19: 269–278.

2712. **Namrata, Kumar, L., Ghosh, D., Dwivedi, S.C. & Singh, B. 2011.** "Wild Edible Plants of Uttarakhand Himalaya: A Potential Nutraceutical Source". *Res. J. Med. Pl.* 5: 670–684.

Abstract: Nutraceuticals have received considerable interest because of their presumed safety and potential nutritional and therapeutic effects. Pharmaceutical and nutritional companies are aware of the monetary success taking advantage of the more health-seeking consumers and the changing trends resulting in a proliferation of these value-added products aimed at heart health to cancer. Majority of the nutraceuticals are claimed to possess multiple therapeutic benefits though substantial evidence is lacking for the benefits as well as unwanted effects. The present review has been devoted towards better understanding of the nutraceuticals based on their disease specific indications.

2713. **Narain, S. & Singh, J. 2006.** "Contribution to the ethnobotanical plants of Sonbhadra district (U.P.)". *J. Econ. Taxon. Bot.* 30 (Suppl.): 18–20.

Abstract: Present ethnobotanical exploration presents the folk medicinal uses of certain plants by Gond and Kharwar tribes of Sonbhadra district of Vindhyan region. About 15 species from 13 families, therapeutically used against different diseases are given in this paper.

2714. **Narain, S. & Singh, U. 2006.** "Contribution to the ethnobotanical plants of Mirzapur district (U.P.)". *J. Econ. Taxon. Bot.* 30(Suppl.): 14–17.

Abstract: The paper deals with fourteen plant species of ethnomedicinal importance used by the Kal tribe and Musahar rural of Mirzapur district, U.P.

2715. **Narain, S., Singh, J. & Singh, U. 2007.** "Ethnobotanical remedies for gastro–intestinal problems from Sonbhadra district, U.P., India". *Indian Forester* 133(1): 135–138.

Abstract: Nineteen species plants have been used by the tribes of Sonbhadra district of Uttar Pradesh for the cure of gastro-intestinal problems. The families of the plants are arranged alphabetically with their botanical names, field number, part of the plant used and gastro-intestinal problem with mode of intake of medicine in tabulated form.

2716. **Narain, S., Singh, U. & Singh, J. 2005.** "Traditional treatment of gastrointestinal problems in Mirzapur district (U.P.)". *J. Phytol. Res.* 18(2): 247–249.

Abstract: The present paper deals with 18 species of plants used by the natives of Mirzapur district for the cure of gastrointestinal diseases.

2717. **Narain, S., Lata, K., Singh, J. & Singh, U. 2005.** "Ethno-medicinal plants of family Asteraceae of Vindhya region (U.P.)". *J. Phytol. Res.* 18(2): 227–229.

Abstract: An account of 36 ethnomedicinal information of 24 plant species belonging to 20 genera of family Asteraceae from Vidhya region of Uttar Pradesh has been given in this paper. Information on the ethnomedicinal use, dosages, mode of administration and field number has been published in this paper.

2718. **Narain, S., Singh, J., Singh, R. & Singh, U. 2007.** "Ethnomedicinal trends of family Fabaceae of Vindhya region (U.P.), India". *Indian Forester* 133(8): 1117–1122.

Abstract: An account of 23 ethnomedicinal plant species belonging to 22 genera of family Fabaceae from Vidhya region of Uttar Pradesh has been given in this paper. Information on the ethno-medicinal uses, dosages, mode of administration, localities and field numbers, is provided.

2719. **Nath, D., Sethi, N., Srivastava, S., Jain, A.K. & Srivastava, R. 1997.** "Survey on indigenous medicinal plants used for abortion in some districts of Uttar Pradesh". *Fitoterapia* 63(3): 223–225.

Abstract: A survey was conducted from March to July, 1987 in the rural areas of districts of Lucknow and Farrukhabad to identify herbs commonly used by women for inducing abortions. Fourteen platns were found to be in common use.

2720. **Nautiyal, A.R., Nautiyal, M.C. & Purohit, A.N. 2000.** *Harvesting Herbs–Medicinal and Aromatic Plants– An Action Plan for Uttarakhand.* Bishen Singh Mahendra Pal Singh, Dehradun.

2721. **Nautiyal, D.C. & Gaira, K.S. 2004.** "Prospects of cultivation of some high priced medicinal herbs in Garhwal Himalaya and their propagation techniques". *J. Non-Timber Forest Prod.* 11(4): 247–253.

Abstract: The present paper gives an account of four potential medicinal herbs that are in great demand and under seveere stress on account of extensive exploitation. Though most of these species exhibit a wide distribution but are threatened in their natural habitat due to over exploitation. The task of finding solutions for their mass multiplication is tar from easy, since very little is known about their method of propagation. Vegetative propagation through rhizome/stolon cuttings is rapid and surer way of mass multiplication in *Acorus calamus* and *Picrorhiza kurrooa*. Hence, efforts were made to develop a standard package for their successful vegetative propagation. Further, these species show low germination percentage and poor seedling establishment, if germinated. Therefore, there is need for a comprehensive propagation technique and a nursery package. A detailed account of propagation techniques and nursery management methods has been presented in the paper. The present study also reports the extent of production potential and net return per hectare after cultivating these herbs in agricultural fields. Such practice can boost the economy of the region and at the same time help in conservation of these species.

2722. **Nautiyal, S. 2002a.** Medicinal plant cultivation in Nanda Devi Biosphere Reserve buffer zone villages. In: Singh, V.K., Govil, J.N. & Singh, G. (Eds.), *Recent Progress in Medicinal Plants, Vol.* I: *Ethnomedicine and Pharmocognosy.* Sci Tech Publishing, Houston, USA Pp. 345–362.

2723. **Nautiyal, S. 2002b.** Medicinal plant cultivation practices of Bhotiyas in Nanda Devi Biosphere Reserve villages of Garhwal Himalaya. In: Samant, S.S., Dhar, U. & Palni, L.M.S. (Eds.), *Himalayan Medicinal Plants: Potential and Prospects.* HIMAVIKAS 14: 317–328. Gyanodaya Prakashan, Nainital.

2724. **Nautiyal, S., Negi, K.S. & Rao, K.S. 2003.** "Ethnobotanical notes on the exploration of germplasm in Om Parvat and Adi Kailash mountains in Uttaranchal". *Hima-Paryavaran Newsletter* 14(1&2)-15(1): 8–10.

2725. **Nautiyal, S., Maikhuri, R.K., Rao, K.S. & Saxena, K.G. 2001.** "Medicinal plant resources in Nanda Devi Biosphere Reserve in the Central Himalayas". *J. Herbs, Spices & Med. Pl.* 8(4): 47–64.

Abstract: The traditional uses, cultivation practices, and economic contribution of medicinal plants to the rural economy in the Nanda Devi Biosphere in the central Himalayas of India were studied. Samplings were done on 16 species of plants stored and used by all the households within the sample areas. A total of eight species were cultivated on 4 percent of the private farm land, evolving as an indigenous practice in response to restrictions on traditional rights to collect in the wild and attempts to meet the increasing demand for medical products in the market place. *Allium humile* and *Allium stracheyi* accounted for 70 percent of the total land area in medicinal plant cultivation. All cultivated species except for *Allium stracheyi* were naturally regenerating in the forests and grazing lands. Among the cultivated species, *Carum carvi* yielded the highest economic returns, followed by *Allium humile*. Products from medicinal plant under cultivation and from species collected in the wild accounted for 3.67 percent and 6.45 percent of the total income, respectively, of an average household.

2726. **Nautiyal, S., Maikhuri, R.K., Rao, K.S. & Saxena, K.G. 2003.** "Ethnobotany of the Tolchha Bhotia tribe of the buffer zone villages in Nanda Devi Biosphere Reserve, India". *J. Econ. Taxon. Bot.* 27(1): 119–142.

Abstract: The inhabitants of the buffer zone villages of Nanda Devi Biosphere Reserve (NDBR) depend entirely on the surrounding vegetation to meet their subsistence demand of fodder, fuel, timber, food, medicine, etc. Edible and some medicinal plants collected/consumed by the local people of NDBR were quantified and their monetary equivalents were calculated based on the prevailing market rates. Present study was conducted for a duration of complete two years (1995-1997) in 10 buffer zone villages of Nanda devi Biosphere reserve, in district Chamoli of Garhwal Himalaya. These villages are inhabited by tribal population belonging to Tolchha a sub-community of the Bhotiya. Ethnobotanically a total of 173 plant species were reported to be used by the people. Of which, 82% plant species are used for medicine, spices and condiments, vegetables and fruits and remaining are used for house construction, fuel, fodder, agricultural implements and fencing, etc. All medicinal and other plant products collected from the wild/nature being used for own consumption only. However, recently for commercial purposes they have started the cultivation of 8-10 species of medicinal/aromatic plants in their kitchen garden and agricultural fields. Produce of these cultivated medicinal plant species are being sold or exchanged/bartered by them in other areas of the region for their economic gain. The documentation of the indigenous knowledge related to medicinal uses of these wild plants or cultivated ones is restricted only with a few people locally known as vaidhyas (local medicinal practinioner) and is extremely important. The knowledge of people plant relationships in conservation priority areas such as NDBR is neede to reduce conflicts between local inhabitants and the Reserve managers through improved management plans.

2727. **Nautiyal, S., Rao, K.S., Maikhuri, R.K., Negi, K.S. & Kala, C.P. 2002.** "Status of medicinal plants on way to Vashuki Tal in Mandakini Valley, Garhwal Himalaya, Uttaranchal". *J. Non-Timber Forest Prod.* 9(3/4): 124–131.

Abstract: A status survey for economically useful plant species was carried out in the Mandakini Vail to Vashuki Tall, a sacred pilgrimage site situated at 4,052 m above sea level in Garhwal Himalaya, a total of 63 accessions of seed, vegetative propagule, twig and whole plant of medicinal and aromatic plant species were collected for further multiplication and germplasm conservation. The density of some important rare medicinal plants found here was compared with that in other valleys. The variation in the density of these plants is discussed in view of their long term conservation and management in Himalayan region.

2728. **Nautiyal, S., Rao, K.S., Maikhuri, R.K., Semwal, R.L. & Saxena, K.G. 2001.** "Traditional knowledge related to medicinal and aromatic plants in tribal societies in a part of Himalaya". *J. Med. Aromat. Pl. Sci.* 22-23: 528–541.

Abstract: Dependence of population on herbal medicines for primary healthcare is still predominant in developing countries like India. Most of such healthcare systems depend on indigenous knowledge systems. The present paper documents the indigenous knowledge systems of three sub-sects of Bhotiyas, viz. Tolchhas, Marchhas

and Jadhs, residing in Niti-Mana and Bhagirathi valleys of Garhwal Himalaya. These communities, which are residing in the same geographical area, are using about 220 plant species, either as whole plants or their parts only (i.e. root, tuber, leaves, stem, bark, etc.). Out of these, about 80% are put in medicinal and aromatic uses. Though use of herbs is known to all people information on time, mode and part to be collected and dosages of each species either individually or together with other or additives has remain restricted to only a few people (Vaidhyas). Thus, the local Vaidhyas command great respect. Though these people are staying in the same geographical area, use of some species and modes are significantly different for each of these sub-sects of Bhotiyas. The knowledge seems to be declining in the younger generation. Thus, it is important to document and revitalise the indigenous knowledge systems.

2729. **Nayak, K.S. & Pant, K.C. 1990.** "Notes on ethnobotany of Garhwali: A tribe of Garhwal Himalaya". *J. Ethnobot.* 2: 81–86.

2730. **Nayar, S.L. 1964.** "Medicinal plants of commercial importance found wild in Uttar Pradesh and their distribution". *J. Bombay Nat. Hist. Soc.* 61(3): 651–661.

Abstract: Present paper deals with forty five medicinal plants of commercial importance, yielding products used as crude drugs, occur wild within the boundaries of the state of Uttar Pradesh. The data relating to the botanical names of these medicinal plants, their trade/Indian names, the part or parts used as crude drugs, along with their distribution, i.e. the areas and places where these plants are found growing wild in Uttar Pradesh is also given.

2731. **Negi, C., Nautiyal, S., Dasila, L., Rao, K. & Maikhuri, R. 2002.** "Ethnomedicinal plant uses in a small tribal community in a part of Central Himalaya, India". *J. Human Ecol.* 14: 23–31.

Abstract: The Raji tribe a smallest group among the native societies of Central Himalaya, inhabiting in Kumaon region bordering to Nepal, has strong faith and belief in traditional health care system, viz. herbal treatment. The living condition of Rajis is extremely poor and neither they have better access to modern health care and nor they have information pertaining to the same. The 50 plant species are documented here pertaining to the uses in traditional health care system of this under developed tribal community. The importance of documenting indigenous knowledge base related to ethnobotany, as described here becomes important in view of rapid socio-economic and cultural changes.

2732. **Negi, C.S. 2003.** "Role of traditional knowledge and beliefs in conservation– Case studies from Central Himalaya, India". *Man in India* 83(3&4): 371–391.

Abstract: The field of environmental studies has been till now concerned mainly with the scientific study of bio-diversity and biophysical excahnage while culture and environment remains a relatively new and uncharted territory. The present study deals with the traditional beliefs and customs being practiced in the central Himalayas and makes an attempt to bring out the inherent environmental principles behind these practices. Pragmatic approaches combining conservation and sustainable uses are considered, as are traditional values that have conserved the forest and wildlife in the past.

2733. **Negi, C.S. 2005.** "Socio-cultural and ethnobotanical value of a sacred forest, Thal Ke Dhar, central Himalaya". *Indian J. Tradit. Knowl.* 4(2): 190–198.

Abstract: The sacred groves/forests have in the recent years drawn the attention of the environmentalists due to their undisturbed conditions, which enable them to be repository of gene pools. Apart from environmental significance the sacred groves are also indicative of the phenomenon of ethno environmental management. It is a social institution which permits management of biotic resources through people's participation. Unfortunately the social significance of the sacred groves has not been studied in depth and the environmental aspects are inevitably over emphasized. The present study deals with the traditional beliefs and social institutions surrounding the sacred forest- Thai Ke Dhar in Kumaon region of the western Himalaya and makes an attempt to bring out the inherent environmental principles behind the conservation practices. In addition, the forest was assessed for its ethnobotanical value to the local herbalists and traditional folk medicine practitioners. Pragmatic approaches combining conservation and sustainable uses are considered as are traditional values that have preserved the sacred groves in the past. Integration of traditional values and protection mechanisms into the newly emerging cultural and religious contexts has been emphasized.

2734. **Negi, C.S. 2010a.** "Traditional knowledge and biodiversity conservation: A preliminary study of the sacred natural sites in Uttarakhand, Central Himalaya". *J. Biodiv.* 1(1): 43–62.

Abstract: Cultural diversity is closely linked to bio-diversity. The study of these interrelationships need to be studied mainly for the simple reason that culture is not only the ethical imperative for development, it is a condition of its sustainability; for there exists a symbiotic relationship between habitats and cultures, between ecosystems and cultural identity, and that this relationship constitutes a determining factor in ensuring sustainable human development. The association of religion with eco-system management is interwoven in the symbolic network of the Himalayan traditional communities. Infact, we cannot think of ecology in the Himalaya without religion. The present study deals with the study of sacred natural sites (forests/groves, pastures, water bodies), within the State of Uttarakhand, and the inherent traditional knowledgebased systems, the taboos, as regards the resource exploitation and other traditional beliefs and customs, in practice surrounding these sacred natural sites. Even though, dilution in norms and taboos restricting the resource use, has undoubtedly got diluted in many of the sacred forests, a significant number of very-well preserved sacred forests, with religiously guarded taboos, do exists, which warrants a detail study, for their floral and faunal diversity.

2735. **Negi, C.S. 2010b.** "Traditional culture and biodiversity conservation: Examples from Uttarakhand, Central Himalaya". *Mount. Res. & Develop.* 30(3): 259–265.

Abstract: Cultural diversity in remote mountain regions is closely linked to biodiversity, as there is a symbiotic relationship between habitats and cultures, and between ecosystems and cultural identity; indeed, religious rules and rituals often strengthen this relationship and are characterized by a conservation ethic. The present paper presents an analysis of information collected from knowledgeable members of mountain communities in the State of Uttarakhand, Central Himalaya. The data collected are analyzed within the framework of traditional knowledge-based systems (TKBS) methodology, using the conservation purpose of rules and practices as a means of typifying the information on sacred natural sites (forests/groves, pastures, water bodies), on the phenomenon of dedicating forests to a deity, on the inherent taboos regarding resource exploitation, and on other traditional beliefs and customs, in order to understand the environmental and conservationist implications of these rules and practices. The analysis shows that the cultural precepts of remote Uttarakhand mountain communities can be considered a precondition for sustainable development. In fact, the association of religion with ecosystem management is inherent in traditional Himalayan communities' culture; one cannot think of ecological systems in the Himalaya without religion. However, this knowledge and related conservation rules need to be strengthened in the face of current change.

2736. **Negi, K.S. 1986.** *Edible Wild Plants of Garhwal Himalaya: An Ethnobotanical Survey.* Ph.D. Thesis, H.N.B. Garhwal University, Srinagar (unpublished).

2737. **Negi, K.S. 1988.** "Some little known wild edible plants of U.P. hills". *J. Econ. Taxon. Bot.* 12(2): 345-–360.

Abstract: The paper gives an account of little known wild edible plants collected from U.P. hills during the years 1982-1985. The area under observation includes districts of Almora, Chamoli, Dehra Dun, Nainital, Pauri, Pithoragarh, Tehri and Uttarkashi which lies between 29Ú to 32Ú N latitude and 78Ú-81ÚE longitude. The enumeration of such little known wild edible plants from the area include 50 species belonging to 40 genera and 30 families.

2738. **Negi, K.S. & Gaur, R.D. 1991 (1993).** "A contribution to the edible wild fruits of Uttar Pradesh hills". *Bull. Bot. Surv. India* 33(1-4): 233–266.

Abstract: The present article pertains to edible wild fruits collected from U.P. Hills during the years 1982-1992. The U.P. Hills are situated in the centre of the Western Himalaya. The enumeration deals with the treatment of 67 families including 122 genera and 170 species. The important families represented by local wild fruits are Rosaceae (25), Moraceae (10), Cucurbitaceae (7), Rutaceae (6), Solanaceae (6), Berberidaceae (5), Anacardiaceae (4), Ehretiaceae (4), Elaeagnaceae (4), Euphorbiaceae (4) and Verbenaceae (4). Vernacular names, English names, important field characters, traditional uses by the natives, flowering and fruiting seasons, distribution and frequency, field numbers and nutritive evaluation for each taxon are presented.

2739. **Negi, K.S. & Gaur, R.D. 1994.** Principal wild food plants of western Himalaya, Uttar Pradesh, India. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent (Indian J Forest.,* Addl. Ser.) 3: 1–78. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: The principal edible wild plants of the Western Himalaya have been considered acoording to their food potential and present taxonomic account deals with the treatment of 113 families including 247 genera and 348 species listed in the present paper. About 164 species of vegetable (124 species of green vegetable, 40 species of root and root like vegetable), 123 as fruits, 40 spices and condiments, 25 beverages and drinks (substitute coffee/tea adulterate and fruit, fruit juice), 35 sauces, pickles, 34 grains, seeds and nuts, 8 edible oil, 52 raw or taken as a salad have been reported.

2740. **Negi, K.S. & Kanwal, K.S. 2009.** "Plants used as fish toxins in Garhwal region of Uttarakhand Himalaya". *Indian J. Tradit. Knowl.* 8(4): 535–538.

Abstract: Garhwal Himalaya is known for its rich bio-resources and ethnocultural diversity. Ethnobiological survey was conducted in different hilly districts of Uttarakhand which reveals their Indigenous Traditional Knowledge (ITK) in fish capture. Fishing is one of the important sources of animal protein for the people of hilly region. In the study, a total of 13 plants, which are significantly used as fish toxicant by local people in the aquatic resources of the Garhwal region have been listed. Plant's characteristic feature, vernacular name, family, distribution, parts used and other ethnobotanical uses have been also described.

2741. **Negi, K.S. & Pant, K.C. 1989.** "Notes on ethnobotany of the Gangwals - A tribe of Garhwal Himalaya". *Ethnobotany* 1(2): 81–85.

Abstract: The present communication deals with the ethnobotany of the Garhwal tribe of Garhwal hills in northern India.

2742. **Negi, K.S., Gaur, R.D. & Tewari, J.K. 1999.** "Ethnobotanical notes on the flora of Har-ki-Doon (district Uttarkashi), Garhwal Himalaya, Uttar Pradesh, India". *Ethnobotany* 11: 9–17.

Abstract: Ethnobotanical studies have been conduceted on the flora of Har-ki-Doon valley situated in district Uttarkashi of Central Himalaya, Uttar Pradesh. Several exploration trips were undertaken in the tribal-dominated villages in remote areas during 1983-1997 for ethnobotanical studies and germplasm exploration and collection. Enumeration has been done of 72 ethnobotanical plants belonging to 35 families and 62 genera.

2743. **Negi, K.S., Mehta, P.S. & Rayal, A. 2012.** "Ethnobotany of *Lepidium sativum* L., 'Pepper Cress' in Himalayan region". *Ethnobotany* 24: 136–137.

Abstract: *Lepidium sativum* L., popularly known as 'Pepper Cress', is locally recognised under different names like 'Haling', 'Chamsoor' in the Himalayan region. Its leaves and seeds are used as spices and condiments round the year. Its various parts are used differently in different region of the Himalayas. The leaves are rich in minerals and vitamins A, B, C and E. The present paper deals with the botany and ethnobotany of the plant used under different vernacular names.

2744. **Negi, K.S., Muneem, K.C. & Pant, V.K. 1998.** "Status of medicinal and aromatic plants in *ex-situ* field gene bank of U.P. Himalaya". *J. Non-Timber Forest* Prod. 5(3/4): 85–95.

Abstract: This report enumerates in brief the status of medicinal and aromatic plant gentic resources introduced, established and maintained in the field gene bank of Regional Station, Bhowali since 1986. A total number of 239 accession, comprising of 190 species belonging to 105 genera in 36 families has been conserved *ex-situ*. The dominant genera of medicinal and aromatic plant wealth are *Achillea* (11), *Calendula*

(5), *Datura* (6), *Hypericum* (5), *Matricaria* (3), *Mentha* (4), *Papaver* (4), *Pelargonium* (5), *Plantago* (12), *Salvia* (11), *Solanum* (5). This paper also highlights the importance of some promising and potential medicinal and aromatic plants and efforts made to popularize them.

2745. **Negi, K.S., Tiwari, J.K. & Gaur, R.D. 1985a.** "Economic importance of some common trees in Garhwal Himalaya: An ethnobotanical study". *Indian J. Forest.* 8(4): 276–289.

2746. **Negi, K.S., Tiwari, J.K. & Gaur, R.D. 1985b.** "Ethnobotanical importance of some trees in Garhwal Himalaya". *J. Indian Bot. Soc.* 61(Suppl.): 32–38.

2747. **Negi, K.S., Srivastava, V.K., Muneem, K.C. & Pant, V.K. 2004.** "Prospects of the garden sage as a new essential oil yielding crop for Uttaranchal". *J. Econ. Taxon. Bot.* 28(1): 13–17.

Abstract: The present article reports preliminary findings on different aspects of garden sage specially with reference to its botany, climate requirements, propagation and its cultivation in the Uttaranchal state.

2748. **Negi, K.S., Tiwari, J.K., Gaur, R.D. & Pant, K.C. 1988.** "Indian butter tree - *Aesandra butyracea* (Roxb.) Baehni, some ethnobotanical notes". *Indian J. Forest.* 11(4): 319–321.

Abstract: *Aesandra* [*Diploknema*] *butyracea* is a multipurpose tree species found in the valley regions of Pithoragarh district of the Kumaon subdivision of the Himalayas, in northern India. The distribution of the species is described, with a brief botanical description and details of its economic importance as food, fodder, bee forage, a source of edible oil, medicine, fertilizer (seed cake), fish poison, pesticide, timber, detergent (from pressed seed cake), and in soil conservation. Sowing is advisable as soon as the seeds are harvested and naturally regenerated seedlings can also be used as planting stock.

2749. **Negi, K.S., Tiwari, J.K., Gaur, R.D. & Pant, K.C. 1993.** "Notes on ethnobotany of five districts of Garhwal Himalaya, Uttar Pradesh, India". *Ethnobotany* 5: 73–81.

Abstract: Results of an ethnobotanical study in five districts of Garhwal Himalaya, viz., Chamoli, Dehra Dun, Pauri, Tehri and Uttarkashi are presented. The status of local inhabitants, their occupation, dependence and utilization of wild useful plants are also described. The use of 57 species in alphabetical order followed by their local names, herbarium number and uses are enumerated.

2750. **Negi, K.S., Tiwari, V., Rawat, R. & Mehta, P.S. 2016.** "Ethnobotany of *Roylea cinerea* (D. Don) Baill., *Karui* in central Himalayan region". *Ethnobotany* 28: 28–30.

Abstract: In India, Uttarakhand state comprises unique topographical conditions. Diverse climate and habitat of Uttarakhand provide favaourable condition for existence of variety of plant species. One of such important medicinal plant, *Roylea cinerea* (D. Don) Baill. is locally recognised under different names like Kadvi, Karui, Titpatti, Patkarru in central Himalayan region. Its leaves, stems, branches and flowers are used in traditional medicines. Its various parts re used differently in different region of the Himalayas. The aerial part of the plant contains diterpenoids viz., Calyone and precalyone used against anti-tumour activities. The present paper deals with the botany and ethnobotany of the plant used under different vernacular names.

2751. **Negi, S.S., Negi, S. & Negi, K.S. 2004.** "Medicinal status of some common weeds of Shivalik Garhwal Himalaya". *J. Econ. Taxon. Bot.* 28(3): 591–596.

Abstract: Garhwal Himalaya if Uttaranchal occupies a significant position in the phytogeography of India, as it is the hub of flora of therapeutic value. Among with rich biodiversity, the weed flora constitutes a significant position of the vegetation. From an extensive survey programme, some common weeds of potential medicinal value were screened out and medicinal uses of these screened weed species have been given alphabetically in the enumeration along with coloured plates.

2752. **Negi, V.S., Maikhuri, R.K. & Vashishta, D.P. 2011.** "Traditional healthcare practices among the villages of Rawain valley, Uttarkashi, Uttarakhand, India". *Indian J. Tradit. Knowl.* 10(3): 533–537.

Abstract: A study on practice of traditional medicine was carried out among the people of Rawain valley, Uttarkashi. The results documented 63 plants to assess their therapeutic significance in managing various diseases in the villages of the valley. Fresh leaves, roots, fruits, bark, stems and some time whole plant are reported to be used for treatment of various ailments. Since, the knowledge of various medicinal plants being used is confined to mostly local healers, it is of utmost importance to document this knowledge for future generation, otherwise it will be lost forever with the death of local healers/knowledgeable person.

2753. **Negi, V.S., Maikhuri, R.K., Maletha, A. & Phondani, P.C. 2019.** "Ethnobotanical knowledge and population density of threatened medicinal plants of Nanda Devi Biosphere Reserve, Western Himalaya, India". *Iranian J. Sci. & Technol. Transactions A: Sci.* 43(1): 63–73.

Abstract: The present study was carried out to investigate the population density, collection pattern and documentation of ethnobotanical knowledge of threatened medicinal plants (TMP) used by the inhabitants of Buffer zone villages in Nanda Devi Biosphere Reserve (NDBR). A total of 36 TMP species belonging to 20 botanical families have been identified that are used in the treatment of various diseases in traditional health care system (THCS). The average population density of TMP species was ranges maximum for *Allium stracheyi* (0.71–1.64 Ind/m^2) followed by *Pleurospermum angelicoides* (0.52–1.56 Ind/m^2) and *Arnebia benthamii* (0.82–1.41 Ind/m^2), respectively in the Biosphere Reserve (BR). *Allium stracheyi* (0.98), *Angelica glauca* (0.91), *Picrorhiza kurroa* (0.89), *Arnebia benthamii* (0.87), *Allium humile* (0.82), *Pleurospermum angelicoides* (0.81), *Bergenia stracheyi* (0.80) with higher use value (UV) were the most used medicinal plants in the villages of BR. The study could be a pilot to reinforce the conservation measures across the Protected Area Network (PAN) by understanding the traditional knowledge of local inhabitants, dynamics of anthropocentric activities and its resultant impacts on medicinal plant diversity.

2754. **Negi, V.S., Maikhuri, R.K., Phondani, P.C. & Rawat, L.S. 2010.** "An inventory of indigenous knowledge and cultivation practices of medicinal plants in Govind Pashu Vihar Wildlife Sanctuary, Central Himalaya, India". *Int. J. Biodiv. Sci., Ecosyst. Serv. & Manage.* 6(3-4): 96–105.

Abstract: This paper presents the results of a study on the indigenous knowledge of local medicinal practitioners known as *Vaidhyas* and other knowledgeable people of Govind Pashu Vihar Wildlife Sanctuary. The purpose was to document indigenous knowledge of medicinal plants and develop strategies for their cultivation to sustain the traditional healthcare system and livelihood of the rural inhabitants. Since knowledge of uses of various medicinal plants is confined to mostly traditional herbal healers, it is of utmost importance to document this knowledge for future generations. We have documented 33 plant species belonging to 32 genera and 28 families used traditionally to cure 28 diseases. The paper also analyses the linkages of various institutions working for medicinal plant cultivation, along with opportunities and constraints in this sector. A survey was conducted to collect information regarding medicinal plant cultivation and the possibilities of cultivating species in the area. The perception of local people on illegal harvesting and cultivation options of medicinal plants in the area is also discussed.

2755. **Negi, V.S., Pathak, R., Chandra Sekar, K., Rawal, R.S., Bhatt, I.D., Nandi, S.K. & Dhyani, P.P. 2018.** "Traditional knowledge and biodiversity conservation: a case study from Byans Valley in Kailash Sacred Landscape, India". *J. Environm. Planning & Manage.* 61: 1722–1743.

Abstract: Ethnobotanical knowledge plays a significant role in plant diversity conservation and the curing of various ailments in remote rural areas of the Indian Himalayan Region (IHR). A total of 53 plant species from 27 families have been documented from the Byans valley and are used traditionally for the treatment of various diseases. Valley inhabitants have maintained a symbiotic relationship between natural resources and their cultural belief system by developing sacred forests/groves which conserve the region's plant diversity pool. Information on sacred natural sites and traditional beliefs was documented in order to understand the environmental and conservationist implications of these rules and practices. The study provides comprehensive information about eroding traditional knowledge and biodiversity conservation practices. This study could be a pilot to strengthen the conservation practices and sustainable utilization of frequently used bioresources by understanding the traditional knowledge system and conservation ethics of tribal communities in the Himalayan region.

2756. **Nigam, G. & Sharma, N.K. 2010.** "Ethnoveterinary plants of Jhansi district, Uttar Pradesh". *Indian J. Tradit. Knowl.* 9(4): 664–667.

Abstract: The paper describes 46 ethnoveterinary plants of Jhansi district of Uttar Pradesh. Plant species are reported along with plant parts and some local formulations used medicinally for the treatment of various animal diseases and disorders.

2757. **Ojha, S.N., Tiwari, D., Anand, A. & Sundriyal, R.C. 2020.** "Ethnomedicinal knowledge of a marginal hill community of Central Himalaya: Diversity, usage pattern, and conservation concerns". *J. Ethnobiol. & Ethnomed.* 16: 29–49.

Abstract: The present study was undertaken to assess use value, diversity, and conservation concerns of medicinal plants used in traditional herbal care system of a marginal hill community in Bageshwar district of Uttarakhand in the Central Himalayan region of India. Extensive surveys were made in 73 villages to gather information on the ethnomedicinal use of plant species used in the traditional herbal healing system. A total of 100 respondents were identified (30 herbal healers called *Vaidyas* and 70 non-healers/natives) and interviewed using semi-structured questionnaires, target interviews, and group discussion. Some important indices such as the use-value index (UV), relative frequency citation (RFC), cultural importance index (CI), and informant consensus factor (F_{ic}) were calculated for the medicinal plants included in the present study. It was recorded that the community uses a total of 70 species with 64 genera and 35 families for curing various ailments. Family *Lamiaceae* recorded the maximum number of medicinal plants. Twenty-one species used most extensively in the traditional health care system. The major parts of the identified plants used for the treatment of various ailments were root/rhizome and leaf. The most common methods used for the preparation of these plants were decoction and infusion. *Ocimum basilicum* L., *Cannabis sativa* L., *Citrus aurantifolia* (Christm) Sw., *Curcuma longa* L., and *Setaria italica* L. had the highest rate of use report. RFC value ranged between 0.03 and 0.91 with highest values for *Setaria italica*, *Zingiber officinale*, *Ocimum basilicum*, and *Raphanus sativus*. The traditional knowledge is passed verbally to generations and needs to be preserved for the future bio-prospecting of plants that could be a potential cure to any future disease.

2758. **Ojha, S.N., Koranga, S.S., Negi, K.S., Mehta, P.S., Pandey, M.M., Rawat, A.K.S. & Tiwari, L.M. 2012.** "Ethnobotanical and chemotypic aspects of *Origanum vulgare* in Uttarakhand Himalayas". *Ethnobotany* 24: 14–19.

Abstract: Oregano (*Origanum vulvare* L.) is one of plant species being put to multifarious uses by the local inhabitatnts of Uttarakhand. To investigate its ethnobotanical and traditional uses in ten Himalayan districts of Uttarakhand, a study was undertaken employing a research design based on the use of random sampling methods and participatory rural appraisal techniques. The study revealed that oregano is used as medicine in various human ailments and as veterinary medicine, in aroma therapy, as flavouring agent in recipes and beverages, and as insecticides, besides being considered sacred, worthy of being offered to Gods and Godesses. Its chemical analysis revealed that it contains p-cymine, Zß-cymine, Eß-cymine, y-terpinene, linalool, thymol and carvacrol as major constituents. The study also indicated that there is a positive correlation between traditional knowledge and modern scientific rationale in respect of various plant uses.

2759. **Padalia, K. 2015.** "Gewai saag: A folk medicine used by the tribal people of Central Himalayan region". *Indian J. Tradit. Knowl.* 14(1): 144–146.

Abstract: Gewai saag is a folk medicine prepared by the leaves and the young stem of the *Solanum nigrum* L. This medicine is frequently used by the tribal and the local community of Uttarakhand state to relief of various sort of body pain. The medicine is highly effective in the joint pain and rheumatism. This article describes the method of preparation of the medicine and its applications along with an objective to conserve the practices of traditional knowledge of plant and plant's products.

2760. **Pala, N.A., Negi, A.K. & Todaria, N.P. 2010.** "Traditional uses of medicinal plants of Pauri Garhwal, Uttarakhand". *Nature & Sci.* 8(6): 57–61.

Abstract: The present study was carried out in some interior areas of Pauri district of Uttrakhand to collect the information of traditionally used medicinal plants by the communities. A total of 61 medicinal plants belonging to 28 families were used by local people to cure different diseases. Out of 61medicinal plant species 13 plant species were having roots and rhizomes as medicinal parts, 7 species containing fruits and flowers as medicinal value, whereas 28 plant species were having leaves as their medicinal plant parts. Almost all these medicinal plants identified were used to cure human diseases and in which 10 plant species were also used to cure diseases of cattle of the local communities. Local communities, especially, older age class, including women heavily use these traditionally available medicinal plants for health and believe that these are easily available, less expensive, and have no side effects.

2761. **Pala, N.A., Negi, A.K., Gokhale, Y., Razvi, S. & Todaria, N.P. 2012.** "Medicinal plant resources in sacred forests of Garhwal Himalaya". *J. Non-Timber Forest Prod.* 19(4): 291–296.

Abstract: The present investigation medicinal plant resources in sacred forests of Garhwal Himalaya were carried out in six sacred protected groves in four districts of Garhwal Himalaya. The aim of the study was to enlist the important plants of medicinal value in these forests. A total of 126 plant species were found of medicinal importance representing 99 genera under 53 families. Herb species contributed the maximum (46.83%) to the total medicinal plant species. The family Rosaceae was the dominant family with (13) species. Leaves are the mostly used plant part, accounting for 41 species followed by roots/rhizomes/bulb with (38) species. The medicine from a tree near temple is considered more holy (prashad) and effective in treating diseases because of penance of deities. The region is enriched with large number of religion based conservation areas with rich vegetation and if studied with wisdom and in detail may prove to be boon for communities and conservation management for such areas.

2762. **Paliwal, G.S. & Badoni, A.K. 1988.** "Ethnobotany of the hill tribes of Uttarkashi– II: Wild edibles". *Bull. Bot. Surv. India* 30(1-4): 111–119.

Abstract: The floristic studies of the Uttakashi district carried out during the year 1983-1986, reveal that the Jaads and the Khos are the major tribes of district Uttarkashi, which still use plants extensively as edibles and for the preparation of beverages. This paper describes the traditional culture of these tribes and their use of wild edibles. 124 different plant species and their edible uses are appended in a list.

2763. **Paliwal, G.S. & Badoni, A.K. 1990.** "Ethnobotany of the hill tribes of Uttarkashi. I: Medicinal Plants". *J. Econ. Taxon. Bot.* 14(2): 421–442.

Abstract: During the floristic studies of the Uttarkashi district, Uttar Pradesh, India carried out in the years 1983-1986, it was noted that the Jaads and Khos constitute the major tribes of the locality which still us plants extensively for medicinal purposes. The present paper attempts to analyse the culture of these people vis-à-vis this

practice. The appendix lists 170 different plant species along with the uses attributed to them.

2764. **Pande, B.J. 2011.** "Unreported traditional uses of *Oroxylum indicum* (L.) Vent. in Kumaon Himalaya". *J. Non-Timber Forest Prod.* 18(4): 321–324.

Abstract: Information on traditional/ ethnobotanical uses of *Oroxylum indicum* (L.) Vent. (Bignoniaceae) from Kumaun Himalaya of Uttarakhand has been dealt with in present communication.

2765. **Pande, G. 1993b.** "Ganjiyari -A traditional herbal drug of Uttarakhand Himalaya". *Sachitra Ayurveda* 46: 118–120.

2766. **Pande, H.C., Datt, B. & Pande, P.C. 2000.** "Notes on the ethnomedicinal aspects of some common pteridophytes of Almora district of Kumaon Himalaya (Uttaranchal)". *Ethnobotany* 12: 56–59.

Abstract: The present paper deals with some common ethnomedicinal uses of seven species of ferns from Almora district of Kumaon Himalaya. A rief description of each species with ecological notes is provided. Illustrations are also given to facilitate identification.

2767. **Pande, N.K., Tewari, K.C, Tewari, R.N., Joshi, G.C., Pande, V.N. & Pandey, G. 1993.** Medicinal plants of Kumaon Himalaya and strategies for conservation. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies*. Gyanodaya Prakashan, Nainital. Pp. 293–302.

2768. **Pande, P.C. & Joshi, P. 1996.** Food and food habits of Kumaunies (Western Himalaya). In: Agrawal, C.M. (Ed.), *Man Culture and Society in the Kumaun Himalayas*. Sri Almora Book Depot, Almora. Pp. 163–179.

2769. **Pande, P.C. & Pangtey, Y.P.S. 1987.** "Studies on ethnobotany-I. On some less edible and economic ferns of Kumaon region of western Himalaya". *J. Econ. Taxon. Bot.* 11(1): 81–85.

Abstract: The present paper describes the seven species of edible and economic ferns of Kumaun Himalaya. An enumeration of these plants quoting correct nomenclature, basionyms, synonyms and local names has been given.

2770. **Pande, P.C., Joshi, G.C. & Kandpal, M.M. 1989.** Ethnobotany of Kumaun Himalaya. In: Shah, N.K., Bhatt, S.D. & Pande, R.K. (Eds.), *Himalayas: Environment, Resources and Development*. Shree Almora Book Depot., Almora. Pp. 285–294.

2771. **Pande, P.C., Joshi, P. & Joshi, G.C. 1998.** Ethnobiology of Kumaun Himalaya II. In: Pande, P.C., Pande, R.K. & Pande, R. (Eds.), *Himalayan Environment Issues and Challenges*. Durga Publishing House, New Delhi. Pp. 148–158.

2772. **Pande, P.C., Joshi, P. & Pande, H.C. 1994.** Studies on ethnobotany-II. On some less known edible, medicinal and economic ferns of Kumaon region of western Himalaya. In: Sharma, T.A. et al., (Eds.), *Current Research in Plant Science*. Bishen Singh Mahendra Pal Singh, Dehra Dun. Pp. 135–137.

2773. **Pande, P.C., Pokharia, D.S. & Bhatt, J.C. (Eds.) 1999.** *Ethnobotany of Kumaun Himalaya*. Scientific Publishers, Jodhpur.

2774. **Pande, P.C., Tewari, L. & Pande, H.C. 2007.** "Ethnoveterinary plants of Uttaranchal– A review". *Indian J. Tradit. Knowl.* 6(3): 444–458.

Abstract: The study reveals that the people of the Uttaranchal state use 364 plants species in ethnoveterinary practices. Bhotiyas, Boxas, Tharus, Jaunsaris and Rhajis are the tribal groups inhabiting in Uttaranchal. Analysis of data indicates that information on 163 plants is significant as it provides some new information of the ethnoveterinary uses. The study is expected to provide basic data for further studies aimed at conservation of traditional medicine and economic welfare of rural people at the study area.

2775. **Pande, P.C., Tewari, L.M. & Pande, H.C. 2006.** *Folk-Medicine and Aromatic Plants of Uttarakhand.* Bishan Singh Mahendra Pal Singh, Dehradun.

2776. **Pande, R.C. 1976.** "Alpine medicinal plants of Dharchula". *Khadi Gramodyog* (November): 115–123.

2777. **Pandey, Anjula. 2002.** "A less-known edible tree, Lauka (*Crescentia cujete* L.) from Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 26(3): 662–664.

Abstract: *Crescentia cujete* L., a small tree native to tropical America and the West Indies was reported as less-known species used fir its edible fruits as vegetable from parts of Uttar Pradesh. The description and information on uses are highlighted.

2778. **Pandey, A. & Arora, R.K. 1989.** "Ethnobotanical evidences *vis-a-vis* domestication trends in 'Cheura' [*Aisandra butyracea* (Roxb.) Baehni]". *Ethnobotany* 1: 41–45.

Abstract: Due to its multipurposes usage, the tree *Aisandra butyracea* (Roxb.) Baehni, locally called 'Cheura', has been protected and domesticated in certain parts of north-western Himalayas. The uses of seed for edible oil, fruit eaten raw or pickled, leaves as fodder, flowers for honey, seed oil in medicine, cake as manure, wood as timber and bark as a fish poison, are discussed. The tree has been partially domesticated. It has economic potential and intensive study of its diversity is recommended.

2779. **Pandey, A. & Gupta, R. 2006.** "Wild economic plants of Uttaranchal Himalaya, India– A review". *J. Econ. Taxon. Bot.* 30(Suppl.): 332–339.

Abstract: The present paper deals with 473 wild economic plant species belonging to 305 genera and 121 families of higher plants from Uttaranchal Himalaya, India. The plant speces have been classified as edible (210 spp.), fodder (81 spp.), wood (185 spp.), medicines (231 spp.), fibes (57 spp.), condiments and spices (24 spp.), dye/ gums and tannins (77 spp.). Species like *Aisandra butyracea, Nardostachys grandiflora, Picrorhiza scrophulariflora, Podophyllum hexandrum* and *Swertia chirayita* with high commercial value, have been suggested for *in situ* on farm conservation.

2780. **Pandey, A. & Sarraf, A. 2010.** Wild useful plants of Uttarakhand Himalaya. In: Uniyal, P.L., Chamola, B.P. & Semwal, D.P. (Eds.), *The Plant Wealth of Uttarakhand.* Jagadambica Publishing Co., New Delhi. Pp. 413–425.

2781. **Pandey, B. & Pande, P.C. 1999.** "Ethnobotanical studies on gymnospermic plants of Kumaun Himalaya". *J. Econ. Taxon. Bot.* 23(2): 253–256.

Abstract: The paper describes the traditional knowledge of fourteen species of gymnosperms of Kumaun Himalaya. The vernacular names and manner of use for each plant are described.

2782. **Pandey, G. 1993a.** "Survey of folk medicine of northern Himalayan regions". *Sachitra Ayuveda 45*(8): *577–585.*

2783. **Pandey, G. 1993b.** "Amees– A traditional herbal drug of Uttarakhand Himalayas". *Sachitra Ayurveda* 45(11): 809–813.

2784. **Pandey, G. 1994.** "Kubjak in Uttarakhand Himalaya: A traditional medicinal plant". *Sachitra Ayurveda* 47(2): 184–192.

2785. **Pandey, G. 1995.** *Medicinal Plants of the Himalaya,* Vols. 1-11. Sri Gurudev Publications, New Delhi.

2786. **Pandey, G., Joshi, G.C., Pandey, N.K. & Tewari, K.C. 1994a.** "Ethnobotanical studies on the medicinal plants of Tarikhet block, Kumaun Himalaya, district Almora, U.P., Part- I". *Aryavaidan* 7(4): 212–223.

2787. **Pandey, G., Joshi, G.C., Pandey, N.K. & Tewari, K.C. 1994b.** "Ethnobotanical studies on the medicinal plants of Tarikhet block, Kumaun Himalaya, district Almora, U.P., Part- II". *Aryavaidan* 8(1): 40–46.

2788. **Pandey, G., Joshi, G.C., Pandey, N.K. & Tewari, K.C. 1994c.** "Ethnobotanical studies on the medicinal plants of Tarikhet block, Kumaun Himalaya, district Almora, U.P., Part- III". *Aryavaidan* 8(2): 74–79.

2789. **Pandey, G., Joshi, G.C., Pandey, N.K. & Pandey, G. 1994d.** "Ethnobotanical studies on the medicinal plants of Tarikhet block, Kumaun Himalaya, district Almora, U.P., Part- IV". *Aryavaidan* 8(3): 159–164.

2790. **Pandey, H.P. 2003.** "Rat population management through *Mucuna* (Cowitch) pods". *Ethnobotany* 15: 100–102.

Abstract: Different species of *Mucuna* Adans. are commonly called as 'Kewanch' in Hindi/Avdhi language, which is Cowitch or Cowage in English. Local farmers of Gonda, Balrampur and adjoining regions use pods of the plant to manage rat population in their fields and prevent damage caused by them below economic ijury level. The practice is quite old and time-tested, but unknown to science. This communication embodies detailed method of rat population management through *Mucuna* pods.

2791. **Pandey, H.P. & Verma, B.K. 2002.** "Plants in oral health care among the aborigins of Gonda and Balrampur regions, Uttar Pradesh, India". *Ethnobotany* 14: 81–86.

Abstract: In this paper, ethnomedicinal information with respect to oral healthcare has been enumerated. The inventory deals with 47 plant species which are used by rural, tribal (Tharu) and Nomadic (Natt and Banjara) people of Gonda, Balrampur and adjoining regions of Uttar Pradesh, India for prevention and cure of their oral problems.

2792. **Pandey, H.S. & Verma, B.K. 2006a.** "Economic potential of seasonal weeds of district Gonda, U.P., India". *J. Econ. Taxon. Bot.* 30 (Suppl.): 21–26.

Abstract: This communication provides an enumeration of 59 monsoon and 37 winter season weeds with phonological pattern and their traditional economic uses recorded

from district Gonda, U.P., India. The submission of a background research to open new perspectives for the seasonal weeds in terms of their utilization for the welfare of mankind and conservation of phytodiversity. About 15 species of weeds, which are typically rainy season weeds, have been found growing during winter also. As such, they may offer availability of raw materials for major part of the year.

2793. **Pandey, H.S. & Verma, B.K. 2006b.** "Notes on some indigenous beauticare tips from Terai region of U.P., India". *J. Econ. Taxon. Bot.* 30(suppl.): 239–242.

Abstract: This communication embodies 28 novel indigenous beauticare tips, commonly practiced by tribal, rural and nomadic people of Terai region of U.P., India as beauty enhancer. In each case exact method of product preparation and mode of application have also been given.

2794. **Pandey, H.S., Verma, B.K. & Narain, S. 1999.** "Ethnoveterinary plants of Gonda region, U.P., India". *J. Econ. Taxon. Bot.* 23(1): 199–203.

Abstract: This communication carries valuable informations on 30 ethnoveterinary plants, commonly used for the treatment of domesic animals by the aboriginal people of Gonda region, with exact method of drug preparation, dose and mode of application.

2795. **Pandey, I.B. 2003.** "Some traditional herbal home remedies used in and around Kanpur city (Uttar Pradesh), India". *Ethnobotany* 15: 129–131.

Abstract: Some interesting and reportedly effective traditional medicinal uses of 19 plant species have been reported which are being used as home remedies by people in and around Kanpur city. This traditional knowledge has survived in families through generations mostly due to traditional mode of oral transmission.

2796. **Pandey, K. & Pandey, S. 2010.** "Indigenous medicines of Raji tribes of Uttarakhand". *Indian J. Tradit. Knowl.* 9(1): 131–133.

Abstract: The paper is an outcome of the extensive field work conducted in the state of Uttarakhand among the tribals. The tribe is socially and economically backward community of Central Himalayan region of Pithoragarh and Champawat district. The paper includes the traditional knowledge of medicine, which is prevalent in the area and also aims to provide information on the concepts like health and disease and the way these simple people cure diseases and drive away illness and sickness.

2797. **Pandey, K.** & **Tiwari, S.P. 2003.** "Studies on ethnobotanical approach of the vanishing tribe Raji". *J. Econ. Taxon. Bot.* 27(4): 947–955.

Abstract: The paper embodies folk-lores regarding the indigenous knowledge of floristic classification and a note on medicinal uses of plants by Raji tribe of Pithoragarh and Champawat district of Uttarakhand state of India. The Raji tribe is most socially economically underdeveloped community of central Himalayan region of Uttaranchal State.

2798. **Pandey, K.C. 2016.** "Ethnobotanical documentation of wild edible plants used by Gujjar community of Tarai West Forest Division Ramnagar, Nainital, India". *Curr. World Environm.* 11(3): 808–818.

Abstract: The present investigation highlights the identification and documentation of wild edible plants used by Gujjar community in foothills of Shiwalik range of Kumaun

Himalaya. Survey method by using semi structured interview schedule with the Gujjar community was used to collect the information. During the survey, a total of 51 plants belong to 33 families and 46 genera were listed as edible, out of which 39% trees, 25% shrubs, 22% herbs and 14% were climbers. Various parts of the plant were used as food, of which fruits and leaves were extensively used. The study also deals with the availability status of listed plants, about 13 plants found abundantly, 09 were common and 29 plants placed in rare category. The results emerge from this study suggested that exploration and documentation of wild edibles plants offer new variety of food to be added in the healthy diet but their survival in near future is threatened due to lack of awareness and documentation. Therefore, both wild edibles plants as well as traditional knowledge need priority action for conservation.

2799. **Pandey, N.C., Joshi, G.C. & Tewari, L.M. 2020.** "Ethnobotanical plant diversity of legumes of Betalghat region, Kumaun Himalaya". *Biolife* 4(4): 629–649.

Abstract: The magnificent Himalaya is well recognized for its bio-physical diversity and socio-cultural heritage, traditional systems and an ample quantity of indigenous knowledge. The study was conducted for the documentation of ethnobotanical use of plants from Betalghat region, Kumaun Himalaya. Total 186 ethnobotanical plants species belonging to 76 families, 160 genera (Angiosperms- 184, Gymnosperms- 2), different habitats such as tress (36%), herbs (31%), shrubs (25%), climbers (8%), were records. Top tendominant families were Fabaceae (13 species), Euphorbiaceae (8 species), Rosaceae (8 species), Solanaceae (8 species), Moraceae (7 species), Caesalpinaceae (6 species), Mimosaceae (5 species), Lamiaceae (5 species), Rubiaceae (5 species), Anacardiaceae (5 species). The majority of plant species were used for medicinal purposes (32%), followed by fuel (23%), fodder (22%), wild edibles (11%), timber (5%), agriculture implements (3%), religious (3%) and fibre (1%) which were further classify according to plants parts used suchas: leafs (33%), wood (26%), root (9%), fruit (9%), bark (7%), whole plant (5%), seed (4%), flower (2%), stem, rhizomes, tuber, resin, latex, twig (1%). It was found that 127 medicinal plant species were used by local people for curing 64 diseases such as fever, diarrhea, cough, cuts and wounds, skin diseases, arthritis, asthma, jaundice, etc.

2800. **Pandey, N.C., Chopra, N., Joshi, G.C. & Tewari, L.M. 2016.** "Agro-diversity and ethno-botanical distribution: A case study of Tarikhet Block, Kumaun Himalaya". *Int. J. Bot. Stud.* 1(5): 32–41.

Abstract: Agro biodiversity play an important role in sustaining and strengthening food, nutrition and health and livelihood security all over the world. The study was conducted to document the agro-diversity and ethno-botanical distribution of Tarikhet block, Kumaun Hiamalya. A structured questionnaire survey, data on different aspect of agriculture diversity and ethno-botanical distribution were obtained. The present study showed 112 landraces including 82 plant species belonging to 64 genera and 31 families, which occupy a total of 105.5 ha land, could be revealed. Of the total 82 species, vegetables exhibited maximum diversity (28%) followed by fruits (25%), pulses (17%), spices (16%) and millets (6%) cereals (4%), and oils (4%). Total extent of crop coverage, maximum area covered by cereals (71.79±1.81 ha) and minimum area covered by oil (0.8±0.10 ha). Out of 31 families recorded, eight dominant

families are Fabaceae (15 species), Cucurbitaceae, Poaceae (8 species each), Brassicaceae (7 species), Rosaceae (5 species), Solanaceae, Rutaceae (4 species each), Moraceae (3 species). Within the documented species, herbs (73%) cover the maximum number of species and shrub (1%) covers the minimum number of species. For each species, scientific and vernacular name, ethno-botanical values of species (Food, fodder, medicinal, fibre, fuel, religious, oils and spices) was provided.

2801. **Pandey, N.C., Bhatt, D., Arya, D., Chopra, N., Upreti, B.M., Joshi, G.C. & Tewari, L.M. 2017.** "Diversity of ethno-medicinal plant: A case study of Bageshwar district Uttarakhand". *J. Med. Pl. Stud.* 5(2): 11–24.

Abstract: The Indian Himalayan region has a wide range of traditionally used medicinal plants. The study was conducted with the help of Participatory Rural Appraisal (PRA) technique to document the ethnomedicinal use of plants from Bageshwar district of Uttarakhand. The present study of Bageshwar district shows distribution and traditional uses of the 144 ethno-medicinal plants, comprises of 64 families (62-Angiosperms, 2-Gymnospermes), different habitats such as herbs (56%), shrubs (22%), tress (15%), climbers (7%), which were further classify according to plants parts used such as: leafs (29%), root (27%), bark (11%), whole plant (9%), rhizomes (5%), fruits (5%), tubers/bulb (4%), seeds (4%), flowers and inflorescences (3%), resin/latex/oil (2%), heart wood (1%). It was found that 144 plant species were used by local people for curing 49 diseases such as cough, fever, jaundice, arthritis, asthma, cuts and wounds etc.

2802. **Pandey, N.K., Joshi, G.C., Mudaiya, R.K., Tewari, V.P. & Tewari, K.C. 2003.** "Management and conservation of medicinal orchids of Kumaun and Garhwal Himalaya". *J. Econ. Taxon. Bot.* 27(1): 114–118.

Abstract: Exploitation of medicinal plants threatened to be endangered and some on the verge of extinction is now a matter of world wide concern on which our civilization is based and thriving at cost of their biological resources. The problem of disappearing species has hitherto been tackled mainly from the standpoint of biology and ecology with less attention to the economical factors which bring species under threat. In this paper, authors discuss some medicinal orchids of Kumaon and Garhwal Himalaya and its perspectives in order to approach conservation measures which serve pragmatic purpose of immediate value.

2803. **Pandey, N.K., Tewari, K.C., Tewari, R.N., Joshi, G.C., Pande, Y.N. & Pandey, G. 1993.** Medicinal Plants of Kumaun Himalaya and Strategies for Conservation. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies*. Gyanodaya Prakashan, Nainital. Pp. 293–302.

2804. **Pandey, R.K. & Pandey, C. 2011.** "Edible flora of aquatic and wetland habitats of Varanasi district, Uttar Pradesh". *J. Non-Timber Forest Prod.* 18(2): 163–168.

Abstract: The present contribution deals with the food value of aquatic and wetland plants of Varanasi district. During study 54 plant spccics belonging to 43 genera and 31 families were found to be useful for their food value. Most of the plants of these habitats were found to be useful for vegetables. Largest family recorded was Poaceae

with six species useful to provide food grains. Certain plants were found to be useful for their edible fruits, seeds, salad, pot-herb, curry and as mouth freshner.

2805. **Pandey, R.K., Pandey, C., Singh, M.P. & Singh, S.D. 2010.** "Ethno-medicinal trends of Musahar community in Varanasi district, Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 34(2): 300–310.

Abstract: The present paper deals with the ethno-medicinal plants used by Musahar community of Varanasi district. Musahar is one of the most poor community of the study area. An ethno-botanical survey was conducted in the 68 villages of Varanasi district inhabited by Musahar during 2005-2008. During survey, 91 plant species belonging to 82 genera and 55 families were found useful from ethno-medicinal point of view. Ethno-medicinal plants are enumerated in alphabetical order along with families, local names, flowering-fruiting period, followed by their ethno-medicinal uses.

2806. **Pangtey, Y.P.S. 1980.** Some Wild Edible Fruits of Kumaun Hills. In: Singh, J.S., Singh, S.P. & Shastry, C. (Eds.), *Science and Rural Development in Mountains*. Gyanodaya Prakashan, Nainital. Pp. 350–363.

2807. **Pangtey, Y.P.S., Rawat, G.S. & Kalakoti, B.S. 1982.** "Usual and supplementary wild food plants of Kumaon". *Himal. Res. Develop.* 1: 35–40.

2808. **Pangtey, Y.P.S., Samant, S.S. & Rawat, G.S. 1989.** "Ethnobotanical notes on Bhotia tribe of Kumaun Himalaya". *Indian J. Forest.* 12(3): 191–196.

2809. **Pant, G.C. 2015.** "Indigenous medicinal practices of rural communities in respect use of the non-timber forest products in Indian central Himalaya". *J. Med. Pl. Stud.* 3(2): 101–107.

Abstract: Indian Central Himalayan region is characterized by a rich heritage of indigenous medicine practices. Indigenous medicinal practices in rural communities of the area are being passed orally hence gradually vanishing in new generations. Documentation of such knowledge accessible with rural communities is vital. Failure to document this indigenous knowledge would represent a tremendous economic and scientific loss to mankind. Therefore, an effort has been made to document the Indigenous medicinal practices in which Non-timber Forest Products (NTFPs) are used by rural communities in this region of India. The study revealed that women possess more knowledge than men about this therapy. About 89.33% people using various plants parts (NTFPs), mostly collected from wild forest, of medicinal plants as healers of different ailments. Their preference for wild sources compared to planted medicinal plants due to the belief that plant parts collected from the former are more effective than those from planted ones. People of the region are frequently using NTFPs of 70 plant species as medicine for curing 28 common diseases, representing to 45 families, and majority of them are collected from the forest and life form wise belonged to trees followed by shrubs, Herb and climber. The species richness is highest for Moraceae; leaves are identified as most frequently used NTFP having medicinal values and contributes in curing a verity of diseases.

2810. **Pant, H.M. & Pant, N. 2012.** "Magico-religious therapies of the Rath region of Garwhal Himalaya". *Report & Opinion* 4: 14–16.

2811. **Pant, H.M. & Sharma, N. 2010.** "Inventory of some exotic cultivated tree species of Doon valley and their ethnobotanical uses". *J. Med. Pl. Res.* 4(20): 2144–2147.

Abstract: Indigenous flora of Doon valley in Northwest Himalaya in the Indian subcontinent, have been subjected to dramatic alteration due to the deliberate and incidental introduction of exotic species from various parts of the world. Human depend heavily on non-native species for food, fodder, timber, medicine etc. Thus, the present communication deals on some cultivated exotic tree species of Doon valley with their origin and ethno-botanical uses. During the study 18 exotic tree species belongs to 14 families was reported which are mostly cultivated as food, fodder timber and medicine purposes in Doon valley.

2812. **Pant, M., Lal, A. & Rani, A. 2014.** "*Hippophae salicifolia* D. Don– A plant with multifarious benefits". *Int. J. Pharm.* & *Pharmaceut. Sci.* 6(11): 1–4.

Abstract: *Hippophae salicifolia* (commonly known as Seabuckthorn) can be regarded as a rich natural source of multivitamins. High amounts of vitamins A, B1, B12, E, K and polyphenols account for its vast nutraceutical properties. Some studies have established the superiority of *H. salicifolia* over other close relatives in terms of bioactive components. Despite all its valuable properties, the plant has an ignored status-both commercially and ecologically. The pharmaceutical, nutraceutical and cosmetic industries continue resorting to other Hippophae species which have comparatively lower nutrient content. To add to it, lack of information about the importance of *H. sailcifolia* among the growers is leading to degradation of natural populations in some regions. The article aims to provide an insight into different aspects of *H. salicifolia* and highlight the need for research and development pertaining to the species.

2813. **Pant, S. 2005.** *Plant Diversity and Ethnobotany of Mornaula Reserve Forest in Kumaun, West Himalaya*. Ph. D. Thesis, Kumaun University, Nainital. (unpublished)

2814. **Pant, S. 2012.** "Ethno-medicinaly important shrubs of Corbett fall and of adjacent areas". *J. Non-Timber Forest Prod.* 19(1): 37–42.

Abstract: The present paper deals with 38 numbers of shrubs belonging to 20 different angiosperm families used by the local people and tribe for their day to day life and for various ailments. The valuable information regarding utlization of plants and various parts used together with botanical name and local name are given.

2815. **Pant, S. & Samant, S.S. 2010b.** "Ethnobotanical observations in the Mornaula Reserve Forest of Kumaun, West Himalaya, India". *Ethnobot. Leafl.* 14(2): 193–217.

Abstract: A field trip was undertaken in the Mornaula Reserve Forest of Kumaun, West Himalaya, India. A collection of plants was made from this reserve forest at an altitude ranging from 1500-2200 m amsl. Local people were contacted for the local names and uses of plants growing there. They are used as medicine, edible, fuel, fodder, timber, fiber, making agricultural implements and religious ceremonies.

2816. **Pant, S., Samant, S.S. & Arya, S.C. 2009.** "Diversity and indigenous household remedies of the inhabitants surrounding Mornaula Reserve Forest in West Himalaya". *Indian J. Tradit. Knowl.* 8(4): 606–610.

Abstract: The remote villages of the Indian Himalayan region are repository of the indigenous knowledge and practices. Documentation of such knowledge is required

in view of the day-by-day disappearing knowledge in new generations. Therefore, an attempt has been made to document the indigenous uses and practices of the plants utilized in household remedies by the inhabitants surrounding the Mornaula reserve forest of Uttaranchal in West Himalaya. A total of 33 plant species belonging to 31 genera and 22 families are used traditionally to cure various diseases/ailments. 31 plant species are non-natives and 02 species are natives to the Himalayan region. Various parts of the these species are used to cure cold, cough, fever, liver disorder, kidney stone, joints pain, eye and ear diseases, diabetes, healing wounds, toothache, etc. Such studies would help developing a comprehensive data base of the plants used in household remedies, strengthening the healthcare system in the villages and also in conserving the traditional knowledge and practices for posterity.

2817. **Pant, S.C. & Pandey, G. 1995.** "Ethnobotanical studies on medicinal flora in Tharu tribal pockets in Kumaon region in U.P." *Bull. Med.-Ethno-Bot. Res.* 16(12): 1–10.

2818. **Parhar, K. & Biswas, S. 1998.** "Medicinal plant resources of Doon valley and adjacent Siwaliks- I". *J. Non-Timber Forest Prod.* 5(1/2): 29–33.

Abstract: The present paper recods 50 plants of medicinal value from Doon valley and adjacent Siwaliks. They have been arranged alphabetically with their vernacular names if any, places of occurrence, flowering and fruiting period, uses. Several of the plant species are likely to go under the category of threatened plants due to over-exploitation and habitat destruction if timely measures are not taken to conserve them.

2819. **Parihaar, R.S., Bargali, K. & Bargali, S.S. 2014.** "Diversity and uses of ethno-medicinal plants associated with traditional agroforestry systems in Kumaun Himalaya". *Indian J. Agric. Sci.* 84(12): 1470–1476.

Abstract: Uttarakhand state is bestowed with great diversity of medicinally important plants which are used frequently by the local people/inhabitants to cure various ailments in their daily life. Traditional agroforestry is a common land use pattern in Uttarakhand which supports various indigenous medicinal plants. The present study provides comprehensive information on the diversity and utilization of medicinally important plants in existing traditional agroforestry systems. The information was gathered using semi-structured questionnaires about the types of ailments treated by the traditional use of medicinal plants, preparation of herbal medicine and formulations. A total of 68 plant species belonging to 38 families and 63 different genera, were reported from agroforestry systems of this region. The families; Rosaceae, Asteraceae, and Verbenaceae were represented by more than 3 species each and dominated the floral composition while remaining 35 families were represented by single species. Different plant parts such as roots/rhizomes/bulbs, leaves, bark, fruits, seeds, flowers, stem and whole plant were used for the treatment of various diseases.

2820. **Phartyal, S.S., Thapliyal, R.C. & Nayal, J.S. 1997.** "*Ulmus wallichiana* (Elm)– An endangered tree of economic value". *MFP News* 7(4): 18–19.

2821. **Phondani, P.C. 2010.** *A study on prioritization and categorization of specific ailments in different high altitude tribal and non–tribal communities and their traditional plant* *based treatments in Central Himalaya*. Ph. D. Thesis. H.N.B. Garhwal Central University, Srinagar (Garhwal). Uttarakhand, India (Unpublished)

2822. **Phondani, P.C. 2011.** "Worth of traditional herbal system of medicine for curing ailments prevalent across the mountain region of Uttarakhand, India". *J. Appl. Pharmaceut. Sci.* 1(9): 81–86.

Abstract: The present study deals with 40 medicinal plant species used to cure a variety of ailments through traditional health care system by the local healers (Vaidyas). These plants were checked and verified from the available literature which revealed that the uses of these plants were newly recorded. Depth studies of 40 new recorded medicinal plants were documented with their different parts being used in herbal medicines. It was also found that one species or some times more species were used for curing one or many diseases together. The nature and type of symptoms of diseases reported of human beings were found varying across the region. All these different kinds of diseases were grouped in to three categories i.e. serious, moderate and common based on the risk factor and seriousness of disease in consultation with doctors practicing different streams of treatment i.e. Vaidyas, Ayurvedic and Allopathic. About more than 40% of local inhabitants were consulted, so as to reveals their perceptions on ranking of 10 common ailments prioritized by the local people based on their preference for opting herbal system of treatments. The traditional herbal system of medicine is one of the most important prevailing systems in the area where modern health care centre are rare or in very poor conditions.

2823. **Phondani, P.C., Maikhuri, R.K. & Bisht, N.S. 2009.** "Medicinal plants used in the health care system practiced by traditional vaidyas in Alkananda catchment of Uttarakhand, India". *Ethnobot. Leafl.* 13: 1453–1467.

Abstract: The present study documents the indigenous knowledge of medicinal plants used in the Alaknanda catchment of Uttarakhand state in India. Ethnomedicinal uses of 100 medicinal plant species along with botanical name, vernacular name, family, habit, part used and folk medicinal uses are presented. They belong to 91 genera and 51 families. These plants have been used to cure 60 types of different ailments out of the 58 plant species used to cure more than one disease. The most widely sought after plant parts in the preparation of remedies are the underground parts such as root, tuber, bulb, rhizome etc. Most of the remedies were reported to have been from herbal species. Approximately 70% of the population was found dependent on herbal treatments and the remaining 30% of the population was dependent on an allopathic form of treatment. In this study it was found that maximum 69% veteran of female category in Berahi valley prefer to visit traditional Vaidyas (traditional herbal practitioners) for curing ailments. The study emphasizes the potentials of the ethnobotanical research and the need for the documentation of traditional knowledge pertaining to the medicinal plant utilization for the greater benefit of mankind.

2824. **Phondani, P.C., Maikhuri, R.K. & Kala, C.P. 2010.** "Ethnoveterinary uses of medicinal plants among traditional herbal healers in Alkananda catchment of Uttarakhand, India". *African J. Tradit. Compl. & Alternative Med.* 7(3): 195–206.

Abstract: The people of far-flung rural areas still depend to a large extent upon plants and household remedies for curing veterinary ailments. The folk knowledge of ethnoveterinary medicine and its significance has been identified by the traditional communities through a process of experience over hundreds of years. The paper deals with 34 ailments commonly found in nine different categories of livestock/ animals (i e. buffalo, cow, oxen, sheep, goat, horse, mule, dog and cat) and their treatment with 73 medicinal plant species belonging to 70 genera and 45 families that occur in forests as well as close vicinity of the rural settlements. Out of the total population, majority of the people (more than 80%) was found dependent on traditional (herbal) system of treatments practiced by local herbal healers (Pashu Vaidyas), while rest of the people preferred modern (allopathic) system of treatments for curing veterinary ailments. In this study we observed that old aged people have more knowledge and experience particularly in remote areas for curing veterinary ailments. The traditional system of treatment is one of the most important prevailing systems in the area where modern veterinary health care facilities are rare or in very poor conditions.

2825. **Phondani, P.C., Maikhuri, R.K., Rawat, L.S., Farooquee, N.A., Kala, C.P., Vishvakarma, S.C.R., Rao, K.S. & Saxena, K.G. 2010.** "Ethnobotanical uses of plants among the Bhotiya tribal communities of Niti Valley in Central Himalaya, India". *Ethnobotany Res. & Applications* 8: 233–244.

Abstract: A study of the medicinal plants and knowledge of diseases was conducted in Bhotiya tribal communities in the Niti valley of Alaknanda catchment in Central Himalaya, Uttarakhand. Indigenous knowledge of local traditional healers about plants used for medicinal purposes was collected through questionnaire and interviews. Eighty-six plant species were identified as being used for treatment of 37 common ailments. The methods and application of uses of these plants varies and was based on the nature of disease.

2826. **Poonam, K. & Singh, G.S. 2009.** "Ethnobotanical study of medicinal plants used by the Taungya community in Terai Arc Landscape, India". *J. Ethnopharmacol.* 123(1): 167–176.

Abstract: The importance/study of community-based ethnobotanical traditional knowledge is ever-increasing for designing strategies for conservation and sustainable use, appropriate drugs and dose-illness relationship. Present study aims to document ethnobotanical attributes of diverse medicinal plants used by the Taungya community to cure ailments in Terai Arc Landscape of India. Ethnobotanical data was recorded by opting peoples' participation approach involving interviews, semi-structured meetings, group discussions and filling of questionnaires. Total 116 medicinal plant species comprising 97 genera and 48 families have been recorded, out of which 16% used externally, 39% used internally and 45% used both externally and internally. Various plant parts were used in form of powder, paste, juice, decoction, infusion, poultice and oral consumption to cure a variety of ailments. Twenty-three species are used as remedies against skin problems, 17 species against rheumatism and 14 species against fever. Taungya community provided vast ethnobotanical knowledge

in form of detail description of 116 medicinal plants (including 82 species with new phytomedicinal claims). Further, investigation on these species may lead to the discovery of novel bioactive molecules.

2827. **Prachi, Chauhan, N., Kumar, D. & Kasana, M.S. 2009.** "Medicinal plants of Muzaffarnagar district used in treatment of urinary tract and kidney stones". *Indian J. Tradit. Knowl.* 8(2): 191–195.

Abstract: A floristic survey of ethnomedicinal plants was conducted at Muzaffarnagar district of Uttar Pradesh to assess the potentiality of plant resources. The study revealed that 15 plant species belonging to 13 families are used as anti-urolithiatic agents in local remedies. The information on medicinal uses is based on the exhaustive interviews with local healers and herbalists, practicing traditional system of medicine. Details of the plants, parts used, method of preparation, dosage and mode of administration have been reported. *Equisetum debile* Roxb. and *Gomphrena celosioides* Mart. are most effective and commonly used in treatment of urinary tract and kidney stones. These may prove precious potential source of bioactive compounds of therapeutic value against uro- and nephro-lithiasis and hence need further critical scientific testing, phytochemical examination and clinical evaluation for the purpose.

2828. **Prajapati, V.K. & Verma, B.K. 2004.** "Ethnoveterinary plants of district Mahoba, U.P.". *J. Econ. Taxon. Bot.* 28(3): 623–626.

Abstract: An ethnobotanical survey was carried out in Mahoba district of south-western Uttar Pradesh. In this paper, 14 plant species used in folk veterinary medicines ae enumerated with exact method of drug preparation, dose and method of application.

2829. **Prakash, A. & Singh, K.K. 2000.** "Observations on some high value ethnomedicinal plants among the tribals of Uttar Pradesh". *J. Med. Aromat. Pl. Sci.* 22: 519.

2830. **Prakash, A. & Singh, K.K. 2006.** "Useful medicinal plants for general tonic, sexual vigour, strength, vitality and venereal diseases among the tribals of Uttar Pradesh and Uttranchal". *J. Econ. Taxon. Bot.* 30(Suppl.): 326–331.

Abstract: The modern societies have considerable decline in their sexual strength, vigour and vitality. Therefore, there is an urgent need to discuss some aphrodisiac and general tonic plants. The state of Uttar Pradesh is rich in floristic and ethnic diversity with unique traditional culture. The tribal and aboriginal populations are living in close proximity of the forests since time immemorial. They collect plants and plant produce for their day-to-day needs and health care. Present paper highlights some potential medicinal plants used for general tonic, sexual strength, vigour, vitality ad venereal diseases among the tribals Some of the important medicinal plants species used are *asparagus racemosus, Curculigo orchioides, Ficus religiosa, F. benghalensis, Helminthostachys zeylanica, Semecarpus anacardium, Sida cordata, Tephrosia purpurea, Withania somnifera, Achyranthes aspera, Phanera integrifolia, Boerhavia diffusa, Bomba ceiba, Hemidesmus indicus, Lygodium flexuosum, Selaginella bryopteris, Tridax procumbens,* etc. The paper also calls further phytochemical, pharmacological and clinical investigation for the isolation and validation of potential medicines for sustainable utilization in human welfare.

2831. **Prakash, R. 2014.** "Traditional use of medicinal plants in Uttarakhand Himalayan region". *Scholars Acad. J. Biosci.* 2(5): 345–353.

Abstract: The Himalayas have a great wealth of medicinal plants and traditional medicinal knowledge. Medicinal plants have played an important role of primary health care system among the local people of Himalayan region. The present paper is a study of the traditional knowledge of medicinal plants and its use by local people of Uttarakhand Region. It is a hill state in the Indian Himalayan region. Due to its unique geographical location and different climatic condition, it has rich biodiversity and variety of plant species. Medicinal plants are the principal health care resources among the most of people in India. Local people of this region are basically depends upon medicinal plants for their primary health care system. Their primary cure of diseases is based upon deep observation of nature and their understanding of traditional knowledge of medical practices. Local people in this region, especially tribal people and women heavily use these traditionally available medicinal plants for health and believe that these are easily available, less expensive and have no side effects as compare to modern medicine. The plants used for medicinal purposes in the primary health traditions are slowly becoming extinct due to development activities, population explosion, impact of tourism, deforestation and many more. The present paper focuses about the indigenous knowledge of different medicinal plants used in the Uttarakhand Himalayan region. Ethnomedicinal uses of 111 medicinal plant species along with botanical name, part used and mode of treatment are given in this paper.

2832. **Prakash, R. 2015.** "Medicinal plants used by tribal communities: A study of Uttarakhand Himalayan region". *Int. J. Humanities & Social Sci. Invention* 4(2): 55–61.

Abstract: The present paper is a study of the traditional medical practices by the tribes of Uttarakhand region. Forest and forest products have historically played a significant role in the economy as well as culture and religious in this region since ancient time. Forest has played an important part in history of civilization. They have affected the distribution of mankind over the earth surface and have influenced the religious life of primitive people. In India, the Indigenous people are predominantly composed of the large and diverse tribal population scattered across several states. In Indian language, there is no exact equivalent for "Tribe", but close synonyms are "Vanavasi (forest dwellers)" or "Adivasi". Tribal people and medical practices are corelated with forest ecology. Tribal communities in this region like Bhotias, Rajees, Tharu, Boxas, and Jaunsarees are distinct in cultures, traditions, languages and customs but have an intimate attachment with forest for their basic needs such as food, fruits, edible roots, leaves, medicinally important plants etc. Their primary health care system is depending on traditional knowledge of medical practices and medicinal herbs. The research and utilization of the traditional medicinal system has become an essential part of the contemporary health care planning, report of world health organization 1978. Therefore the objective is to analyze the paper in two sections. Firstly, the importance of medicinal plants and secondarily, medicinal plants used by tribal communities in this Himalayan region. It is a combined study of historical and scientific approach of traditional medical practices in Uttarakhand.

2833. **Prasad, S. & Tomar, J.M.S. 2020.** "Distribution and utilization pattern of herbal medicinal plants in Uttarakhand Himalaya: A case study". *J. Med. Pl. Stud.* 8(3): 107–111.

Abstract: The present study was carried out in forest fringe area villages of Garhwal Himalaya to understand the distribution and utilization patterns of medicinal plants. We found 32 plant species that are being used by local communities. Among these plant species, most of the species were found frequently distributed. As per the utilization pattern, 7 medicinal plant species were found underutilized while 5 species were recorded as over-utilized species. The study recommends a sustainable use of over-utilized species and commercial utilization of underutilized species.

2834. **Priyanka & Baunthiyal, M. 2016.** "An ethno-botanical study of medicinal plants of Ghurdauri region, Uttarakhand, India". *J. Med. Pl. Stud.* 4(5): 200–205.

Abstract: Uttarakhand has a vast medicinal and floristic wealth making it a centre of attraction for many herbal industries. The vegetation of Uttarakhand includes annual, biennial or perennial herbs, undershrubs and shrubs. Proper identification of the plant species and their importance to the local people can provide useful information and play a pivotal role in efficient utilization of natural wealth. So it is important to scientifically identify and document this natural wealth before they are lost forever. The present study includes the collection and compilation of different plant species of Ghurdauri region. The database provides information on various aspects such as species richness and medicinal use for the different families of plants of Ghurdauri region. Findings of the present investigations, revealed a total of 21 families and 33 species that are used by native communities for treating several ailments.

2835. **Pundir, Y.P.S. & Singh, D. 1997a.** "Wild edible fruit plants of Jaunsar-Bawar – I. The Weeds- I". *World Weeds* 4: 81–108.

2836. **Pundir, Y.P.S. & Singh, D. 1997b.** "Wild edible fruit plants of Jaunsar-Bawar - II. The Honey Sucking plants- I". *World Weeds* 4: 227–231.

2837. **Pundir, Y.P.S. & Singh, D. 1998a.** "Wild edible fruit plants of Jaunsar-Bawar - III. The Weeds- II". *World Weeds* 5: 1–19.

2838. **Pundir, Y.P.S. & Singh, D. 1998b.** "Wild edible fruit plants of Jaunsar-Bawar - IV. The *Ficus* species". *World Weeds* 5: 91–100.

2839. **Pundir, Y.P.S. & Singh, D. 1998c.** "Wild edible fruit plants of Jaunsar-Bawar - IX. The Shrubs". *World Weeds* 5: 153–163.

2840. **Pundir, Y.P.S. & Singh, D. 1998d**. "Wild edible fruit plants of Jaunsar-Bawar - X. The Mistletoes". *World Weeds* 5: 177–178.

2841. **Pundir, Y.P.S. & Singh, D. 1999a.** "Wild edible fruit plants of Jaunsar-Bawar - V. The Trees- I". *Advance Pl. Sci. Res. India* 9: 117–126.

2842. **Pundir, Y.P.S. & Singh, D. 1999b.** "Wild edible fruit plants of Jaunsar-Bawar- VI. The Trees- II". *Advance Pl. Sci. Res. India* 10: 89–99.

2843. **Pundir, Y.P.S. & Singh, D. 2002.** "Ethnobotanical wild food plants of Jaunsar-Bawar (Western Himalaya), Uttaranchal". *Indian Forester* 128(5): 571–582.

Abstract: The paper reports forty wild edible food plants used by the natives of Jaunsar-Bawar tribal area. A list of 137 more wild food plants already reported from this area by the aothors is also given.

2844. **Purohit, A., Maikhuri, R.K., Rao, K.S. & Nautiyal, S. 2001.** "Revitalizing drink: An assessment of traditional knowledge system in Bhotiya community of Central Himalayas, India". *Indian J. Tradit. Knowl.* 1(1): 72–80.

Abstract: Bhotiya communities inhabiting the higher altitudes of the Central Himalayas use traditional tea throughout the year and consider it very energetic and nutritive for health. The study area is located in the buffer zone of Nanda Devi Biosphere Reserve of Garhwal region of Central Himalaya. A variety of wild plants and their different parts, i.e. bark of *Taxus baccata* subsp. *wallichiana*, dry leaves of *Bergenia ligulata*, gum of *Betula utilis* and fresh leaves of *Origanum vulgare*, are used in traditional tea preparation. Among the species used in traditional tea preparation, *T. baccata* is consumed maximum followed by *B. ligulata, B. utilis* and *O. vulgare*. However, the quantity and frequency of tea consumption varied with the season and climatic conditions. The present paper discusses the collection and consumption pattern of the wild plants and their parts used in various purposes including traditional tea preparation and the indigenous knowledge involved in.

2845. **Purohit, A.N. 1997.** Himalayan Medicinal Plants - Focus on Uttarakhand. In: Dhar, U. (Ed.), *Himalayan Biodiversity: Action Plan.* GBPIHED *Himvikas* 10: 91-110. Gyanodaya Prakashan, Nainital.

2846. **Purohit, A.N. 2004.** "Medicinal and aromatic plant sector: Potential and possibilities in Uttaranchal". *Financ. Agric.* 36(3): 19–26.

2847. **Purohit, A.N. 2004b.** "Overview of state policies, plans and interventions to promote the medicinal plant sector in Uttaranchal". *Searching Synergy Bull.* (Royal Tropical Institute, Amersterdam) 359: 21–29.

2848. **Purohit, K. & Samant, S.S. 1995.** *Fodder Trees and Shrubs of Central Himalaya.* Gyanodaya Prakashan, Nainital.

2849. **Purohit, V.P., Silas, R.A. & Gaur, R.D. 1985a.** "Plants in the folk songs, proverbs and folk tales of Raath zone (Pauri Garhwal)". *Eastern Anthropologist* 38(1): 33–44.

2850. **Purohit, V.P., Silas, R.A. & Gaur, R.D. 1985b.** "Ethnobotanical studies of some medicinal plants used in skin disease from Raath (Pauri) Garhwal Himalaya". *J. Sci. Res. Pl. Med.* 6: 39–47.

2851. **Rahul, J. 2013.** "An ethnobotanical study of medicinal plants in Taindol village, district Jhansi, region of Bundelkhand, Uttar Pradesh, India". *J. Med. Pl. Stud.* 1(5): 59–71.

Abstract: An ethnobotanical study was conducted from August 2010 to October 2011 to investigation the uses of medicinal plants by people of Taindol village, Baruasagar, district Jhansi, Uttar Pradesh. The information about the medicinal uses of personal interviews of rural peoples. The present paper reported 57 medicinal plants belonging to 37 families and 53 genera. The information of medicinal plant was collected by local people of Taindol village, region of Bundelkhand. These medicinal plants are used by the Rural peoples for the treatments of various disease like anemia, aphrodisiac, jaundice, small pox, leprosy, antiseptic cough, sores, skin disease, cancer,

piles, diarrhoea, diuretic, low blood presser, dysentery, headache, diabetes, asthma, toothache, purify blood, sedative, gonnorrhoea, fever, madness, disorders, ulcer, urinary, discharges and many diseases. The present paper focused on medicinal uses of plants.

2852. **Rajan, S., Gupta, H.C. & Kumar, S. 1999.** "Exotic medicinal plants of Lucknow". *J. Econ. Taxon. Bot.* 23(1): 205–222.

Abstract: The present study enlists 87 exotic medicinal plants under 78 genera of 42 families invariably used for preparation of medicine in homoeopathic system. They are introduced and cultivated for medicinal value as well as garden ornaments. Each species is incorporated with its correct name, common name (English), brief description, distribution, part used and clinical applications.

2853. **Rajwar, G.S. 1983.** "Low altitude medicinal plants of south Garhwal". *Bull. Med.-Ethno-Bot. Res.* 4: 14–28.

2854. **Rajwar, G.S. 1984.** "Exploitation of medicinal plants of Garhwal Himalaya". *Sci. & Environm.* 2: 37–41.

2855. **Rajwar, G.S. & Kumar, S. 2011.** "Fuelwood consumption in two tribal villages of the Nanda Devi Biosphere Reserve of Indian Himalaya and strategies for fuelwood sustainability". *Environm., Develop. & Sustain.* 13: 727–741.

Abstract: Fuelwood is the only important source of energy in the mountainous region of the Garhwal Himalaya, India. Since the commercial source of energy is generally beyond the reach of ordinary people due to their poor socio-economic conditions and due to limited supply and lack of communication facilities for transport of LPG, the villages of the inner region of the Garhwal Himalaya depend on their fuel requirement from the forest. In the present study, two villages of the Nanda Devi Biosphere Reserve in Uttarakhand part of the Indian Himalaya i.e. Lata and Dunagiri located at 2,415 and 3,600 m altitudes, respectively, were selected for the study of socio-economic profile and vegetation and for estimation of per capita fuelwood consumption and the degree of disturbance. The study was conducted from 2002–2005. The population of these villages is migratory and belongs to the *Bhotiya* community, a scheduled tribe consisting of two subgroups known as *Tolcha* and *Marchha*. They grow traditional crops as well as cash crops. Important tree species used for fuelwood include *Cedrus deodara, Pinus wallichiana, Cupressus torulosa, Taxus wallichiana, Acer indicum, Quercus dilatata* and *Viburnum cotinifolium*. Maximum density among trees was shown by *Pinus wallichiana* (169.6 trees ha^{-1}) in village Lata and by *Cedrus deodara* (89.6 trees ha^{-1}) in village Dunagiri. The average per capita consumption of fuelwood in villages Lata and Dunagiri was 4.03 and 4.77 kg $capita^{-1}$ day^{-1}. Maximum number of trees (29 and 31% lopping for Lata and Dunagiri, respectively) belonged to disturbance class 1 (1–20% lopping) followed by the disturbance class 2 (20–40% lopping). Due to location of these villages in the buffer zone of the biosphere reserve, the fuelwood consumption may cause an adverse impact on the ecological status of this reserve, which urgently requires employing strategies for the conservation and management of this biosphere in terms of fuelwood sustainability e.g. regulation of livestock stock and grazing, using alternative sources of fuels, plantation of multipurpose trees and adoption of ecotourism.

2856. **Rana, C.S. 2009.** *Ethnobotanical Studies on the Medicinal Plants of Nanda Devi Biosphere Reserve, Uttaranchal.* Ph.D. Thesis, H.N.B. Garhwal University, Srinagar. (unpublished).

2857. **Rana, C.S., Ballabha, R., Sharma, A., Dangwal, L.R. & Tiwari, J.K. 2013.** "Herbal remedies for leucorrhoea: A study from the Garhwal Himalaya, India". *Global J. Res. Med. Pl. & Indigenous Med.* 2(10): 685–691.

Abstract: In the study, an attempt has been made to document the indigenous uses and practices of plant species utilized as herbal remedies for the treatment of leucorrhoea by the inhabitants of Garhwal Himalaya. The present study provides 24 significant medicinal plants belonging to 23 genera and 17 families used as herbal remedies for the treatment of leucorrhoea. It is observed that mostly, the underground parts (roots, tubers, bulbs, rhizomes, etc.) are being used in the preparation of remedies taken either singly or mixed along with water. A list of plant species along with their family, vernacular name, life form, specimen voucher number, plant part(s) used, method of preparation and dosage pattern of the herbal remedies are provided.

2858. **Rana, C.S., Ballabha, R., Tiwari, J.K. & Dangwal, L.R. 2013.** "An ethnobotanical study of plant resources in the Nanda Devi Biosphere Reserve (a world heritage site), Uttarakhand, India". *J. Ethnobiol. & Tradit. Med.* 120: 591–601.

Abstract: The present study provides a detailed and comprehensive account of ethnobotany from Nanda Devi Biosphere Reserve (a world heritage site), Uttarakhand, India has been presented. The study was carried out in the remote villages of NDBR located in the core, buffer and transitional zones of the Nanda Devi Biosphere Reserve. The inhabitants of the area belong to the Indo-Aryan group (Garhwalis) and Indo-Mongoloid group (Bhotias and Tolchhas) and are rich in ethnobotanical knowledge. The information has been collected from the local inhabitants who had sound knowledge about the uses of wild plants. A total of 160 plant species belonging to 124 genera and 64 families have been reported for their ethnobotanical uses. The uses of the plant species as medicine (80 species), food (50 species), oil (5 species), beverages (16 species), condiments (9 species), timber (17 species), fiber (11 species), religious (18 species) and miscellaneous (30 species) showed that these species are very important for the sustenance of the inhabitants of NDBR. The study will be helpful in developing a comprehensive data base of plant resources for technological advancement, economic prosperity, generating employment opportunities to the local people and in conserving the traditional knowledge for future generations.

2859. **Rana, C.S., Tiwari, J.K., Dangwal, L.R. & Gairola, S. 2013.** "Faith herbal healer knowledge document of Nanda Devi Biosphere Reserve, Uttarakhand, India". *Indian J. Tradit. Knowl.* 12(2): 308–314.

Abstract: The aim of the study was to identify and document medicinal plants used by the faith herbal healers of Nanda Devi Biosphere Reserve along with their uses and preparation. Ethnomedicinal surveys were conducted in the remote villages of Nanda Devi Biosphere Reserve (NDBR) district Chamoli during the years 2004-2010. The

study revealed uses of 90 plant species (87 Angiosperms and 3 Gymnosperms) belonging to 45 families and 80 genera. These plants were found to be used for treating diabetes, arthritis, cardiac complaints, asthma, leucorrhoea, infertility, mental disorder, flatulence, abdominal complaints and chronic fever, etc.

2860. **Rana, C.S., Tiwari, J.K., Dangwal, L.R. & Sundriyal, R.C. 2012.** "Herbal remedies for sexual capability". *Indian J. Tradit. Knowl.* 11(4): 646–651.

Abstract: Present paper document folklore medicines used by the tribal communities inhabiting in buffer zone of Nanda Devi Biosphere Reserve, Uttarakhand. The field work was carried out among the tribes viz. Bhotiyas, Tolchhas and among the general inhabitants living in the vicinity of the forests and remote localities. These communities utilize plants and plant products as aphrodisiac medicine. This paper deals with 17 significant medicinal plants belonging to 16 genera and 14 families used by the local community for the treatment of sexual incapability.

2861. **Rana, C.S., Sharma, A., Dangwal, L.R., Tiwari, J.K. & Kumar, N. 2010.** "Ethnopharmacology of some important medicinal plants in Nanda Devi National Park, Uttaranchal, India". *Nature & Sci.* 8(11): 9–14.

Abstract: Ethnopharmacology deals with the applied aspects of plants and has been emerged as an important discipline of traditional botany with modern sciences. With the increasing demands of vegetational resources in developing world, it has been attracted much attention in recent past. The paper presents few of the important medicinal plants present in alpine and sub alpine regions of core and buffer zone of Nanda Devi National Park (NDNP), district Chamoli, Uttarakhand. Ever since inhabitants and tribal communities have strong faith and belief in Indigenous Health Care system, they have been interviewed along with herbal practitioners, priests and shepherds during the entire study. Establishing small scale industry on medicinal plants may be helpful in capacity building of unprivileged inhabitants of this remote region.

2862. **Rana, T.S., Datt, B. & Rao, R.R. 1996.** "Strategies for sustainable utilization of plant resources by the tribals of the Tons valley, Western Himalaya". *Ethnobotany* 8: 96–104.

2863. **Rana, T.S., Datt, B. & Rao, R.R. 2004.** "Soor: A traditional alcoholic beverage in Tons Valley, Garhwal Himalaya". *Indian J. Tradit. Knowl.* 3(1): 59–65.

Abstract: The aboriginal communities in the hilly and mountainous Tons Valley (Garhwal Himalaya of Uttaranchal) have traditionally had recourse to Soor– a traditional alcoholic beverage to cope with adverse climatic conditions and also on ceremonial occasions as well as festivals. This paper describes the indigenous method of preparing Soor. It also explores the role of Soor in the life and culture of aboriginal people.

2864. **Ranjan, V. 1996.** Some Ethno-medicinal plants of Lalitpur district, U.P. In: Jain, S.K. (Ed.), *Ethnobiology in Human Welfare*. Deep Publication, Delhi. Pp. 149–150.

2865. **Ranjan, V. 1999.** "Exotic medicinal plants of district Lalitpur, Uttar Pradesh". *Bull. Med.-Ethno-Bot. Res.* 20(1-4): 54–65.

Abstract: An extensive survey of the flora of Lalitpur, U.P. was conducted and the study revealed the occurrence of seventy medicinally useful exotic species which have been enumerated providing their family name, origin, medicinal uses, biological

activity of various plant parts as a drug, local habitat and field book number. It has been observed that out of 70 plant species, about 43% are native to America which has been estimated to be the largest in number whereas species of the Australian and Eurasian origin are poorly represented. In between these lie species of Pantropical, Palaeotropical, Asiatic, Indo-Malayan and European origin. Analysis of these exotic species revealed that 15-16% exhibited anticancerous, cardio-vascular and antimicrobial activity while 0.75% have shown antibiotic property.

2866. **Rao, K.S., Maikhuri, R.K., Nautiyal, S. & Saxena, K.G. 2003.** Ethnobotany of Tolcha sect of Bhotia community of Garhwal Himalaya. In: Singh, V.K., Govil, J.N. & Singh, G. (Eds.), *Recent Progress in Medicinal Plants: Ethnomedicine and Pharmacognosy.* SCI Tech Publishing, Houston, Texas, USA. Pp. 9–32.

2867. **Rao, N.S.V.P. & Rao, N.P.C. 1987.** "A note on some medicinal plants of the Siwalik hills of Garhwal Himalayas". *J. Econ. Taxon. Bot.* 11(2): 299–304.

Abstract: The paper deals with the medicinal values of some traditional medicinal plants which are used as medicine by the villagers and tribes of the Siwalik Hills of Garhwal Himalayas. Several medicinal plants were found to be used extensively by the inhabitants of this region. The medicinal value of plant parts and also of a plant as a whole are discussed in general.

2868. **Ratha, K.K., Rungsung, W., Dutta, S., Joshi, G.C. & Hajra, J. 2014**. "Some important herbaceous medicinal flora of alpine and sub-alpine ecosystem of Western Himalaya". *American J. Pharm. & Health Res.* 2(9): 54–64.

Abstract: The alpine and subalpine region of western Himalaya has long been known as one of the world richest treasuries of medicinal plants due to its diverse topographic and climatic conditions. The alpine meadows and subalpine forest ecosystem support mainly medicinal herbs which are very significant for traditional system of medicine. The present study is the outcome of decades of survey carried out in the high altitude region of alpine and subalpine area of Uttarakhand. It evaluated the important herbaceous medicinal plants existing in the region along with their specific habitat, phenology pattern and uses.

2869. **Rau, M.A. 1967.** "The sacred Mulberry tree of Joshimath, U.P.". *Indian Forester* 93(8): 533–535.

Abstract: The paper gives an account of the growth habit and branching of a very old tree of *Morus serrata* Roxb., which is said to date back to the 8th century A.D. when the great religious preceptor, Adi Shankaracharya is stated to have meditated sitting under this tree.

2870. **Rawat, B., Chandra Sekar, K. & Gairola, S. 2013.** "Ethnomedicinal plants of Sunderdhunga valley, Western Himalaya, India– Traditional use, current status and future scenario". *Indian Forester* 139(1): 61–68.

Abstract: The Sunderdhunga valley harbors a number of medicinal plants used by the local people in different purposes. A total of 76 ethnomedicinal plants have been enumerated in the present communication with correct binomials, family, life form, local name along with detailed ethnomedicinal uses. These species belong to 27 families and 56 genera. Out of total species recorded, 82% belongs to only 11

families, on the other hand 48% of total families represented by single species. Fifteen of the recorded species are categorized under different threat category, constituting about 20% of total species. Major cause of depletion of these species is over exploitation of the wild populations and illegal trade. Important measures required to conserve the biodiversity of the valley include documentation of the traditionalecological and remedial knowledge of the locals for sustaining future generation and motivation to cultivate rare or threatened species in nearby villages.

2871. **Rawat, G.S. & Pangtey, Y.P.S. 1987c.** "A contribution to the ethnobotany of alpine regions of Kumaon". *J. Econ. Taxon. Bot.* 11(1): 139–148.

Abstract: The present paper deals with the ethnobotany of the alpine region of Kumaon. 148 plant species occurring above 3300 m are reported herein and they are arranged alphabetically with their botanical names, local names, respective families and their local uses.

2872. **Rawat, G.S., Adhikari, B.S. & Chandola, S.K. 2004.** *Manual for Rapid Inventory and Mapping of Medicinal and Aromatic Plants in Uttaranchal.* Uttaranchal Medicinal and Aromatic Plant Board, Dehradun.

2873. **Rawat, G.S., Adhikari, B.S., Chandola, S., Tiwari, U.L. & Raut, N.B. 2012.** Rapid Survey and Mapping of Medicinal Plants in Forest Divisions of Garhwal Region, Uttarakhand. Technical Report, submitted to Uttarakhand Forest Department, Dehradun.

2874. **Rawat, G.S., Adhikari, B.S., Tiwari, U.L., Raut, N. & Chandola, S. 2013.** *Status and Distribution of Medicinal Plants in various Forest Divisions of Garhwal Region, Uttarakhand.* Wildlife Institute of India (WII), Dehradun.

2875. **Rawat, H., Rani, A. & Goel, A. 2019.** "Sustainable traditional dyeing of wool by Bhotia tribe in Himalayan region: A case study". *J. Appl. & Nat. Sci.* 11(2): 379–383.

Abstract: Bhotia tribe is one of the community residing in the high Himalayan region of Uttarakhand state that shares the border with Tibet. The tribe is divided into five sub-groups viz., the Jadhs, Marchas, Tolchas, Shaukas and Rung. The present study was conducted in the five villages namely Lata and Chinka from Chamoli, Darkot and Baluwakot from Pithoragarh and Dunda from Uttarkashi of Uttarakhand for exploring the information from different sub-groups of Bhotia tribe about plants used by them for extracting dyes and used for traditional textile coloration in past and during present time. The rich flora of Himalayan region in Uttarakhand has been abode to varieties of plant species. The wild plant species were used by the Bhotia tribals for dyeing their woolen products. These plant dyes were obtained from jangli palak (*Rumex nepalensis*), bagmaru (*Eupatorium* sp.), kilmora (*Berberis asiatica*), akhrot (*Juglans regia*), dholu (*Rheum australe*), tea leaves, tantri (*Rheum moorcroftianum*), kaphal (*Myrica esculenta*), darim (*Punica grantum*), burans (*Rhodendron araborium*) and harda (*Terminlia chebula*). Today only Shauka and Jadh tribals are using natural dyes for dyeing woolen yarn. Reasons for the reduction in usage of natural dyes among Bhotia tribals were the extinction of plant species, change in land use, natural disasters, government restriction on plucking certain plant species, the availability of synthetic dyes and colored yarns at low cost in the market. The identification of factors that led to the non-practice of sustainable dying practice among tribals for woolen craft will help in planning and conducting interventions through public, private and government organizations.

2876. **Rawat, M., Vasistha, H.B., Manhas, R.K. & Negi, M. 2011.** "Sacred forest of Kunjapuri Siddhapeeth, Uttarakhand, India". *Trop. Ecol.* 52(2): 219–221.

Abstract: Sacred forests are a new frontier for interdisciplinary research and are relevant for biodiversity conservation. However, several sacred forests are experiencing failure of legal protection in guaranteeing their integrity and conservation. To bridge the gap between the needs of local people and to safeguard the health of these sacred places, immediate steps are called for. The present study was conducted in Kunjapuri Siddhapeeth, which is one of the 52 Siddhapeeths of India. A total of 239 plant species belonging to 78 families and 207 genera were collected from the study area. Out of these, nine species are considered threatened and three species vulnerable. Presently, the health of this sacred forest is deteriorating under constant anthropogenic pressures. These disturbances are also a threat for various rare, vulnerable and threatened plants. These forests are maintained and managed by the forest department and the locals are not co-operating. Therefore, the government should either promote community-based conservation of biodiversity in these forests or their administration should be handed over to temple authorities.

2877. **Rawat, N. & Upadhaya, M.L. 2020.** "Diversity of the medicinal plants of Almora district, Uttarakhand and their ethno-medicinal use". *J. Med. Pl. Stud.* 8(3): 89–101.

Abstract: The present study mainly focus on the identification, documentation and conservation of ethno-medicinal plants traditionally used for treating various ailments and diseases by the local villagers of Almora district of Uttarakhand. A total of 50 different species of trees and shrubs have been identified belonging to 28 families and 43 genera with the most dominant family Rosaceae followed by Moraceae used in the treatment of 25 diseases and ailments.

2878. **Rawat, R. & Vashistha, D.P. 2011.** "Shortlisting of cultivable herbal plants in the Bhabhar region of the Garhwal Himalaya, Uttarakhand, India". *Int. J. Med. Aromat. Pl.* 1(1): 23–27.

Abstract: The success of any economically viable herbal cultivation programme lies in the appropriate selection of herbal plants. Many things will have to be considered in selecting herbs viz. adaptability in natural environment, economic demand in herbal industry and agroclimatic aspects. The present work embodies the results of the scrutiny of herbal composition of popular branded Ayurvedic medicines. In addition, with the help of field survey and available literature, plants were identified which are naturally growing in different habitats of the Bhabhar region of the Garhwal Himalaya, Uttarakhand. On the basis of utility in herbal medicines and their ability to grow n aturally, plants are further shortlisted for the cultivation. The prominent herbs recommended are: *Aloe barbadensis, Bacopa monnieri, Boerhavia diffusa, Plumbago zeylanica, Tinospora cordifolia, Withania somnifera* etc. The promotion of cultivation of these useful herbs would ensure sustainable biodiversity conservation and alleviation in the economic conditions of the rural people of the Bhabhar region of Garhwal Himalaya.

2879. **Rawat, R. & Vashistha, D.P. 2013.** "*Roylea cinerea* (D. Don) Baillon: A traditional curative of diabetes, its cultivation prospects in Srinagar valley of Uttarakhand". *Int. J. Adv. Pharm. Biol. & Chem.* 2(2): 372–375.

Abstract: *Roylea cinerea* (D. Don) Baillon, is traditionally used for the cure of ailments such as fever, jaundice, skin disease, malaria and most prominently in diabetes. Present communication provides information on the herbal uses, phytochemical composition, and propagation behaviour of this plant. The plant is propagated both by seeds and vegetativly. The highest seed germination was observed in sandy soil, whereas the maximum vegetative propagation by stem cutting was observed in farmyard compost in spring season.

2880. **Rawat, V.S. 2016.** "Medicinal plants and sustainable livelihood in Pauri district of Garhwal Himalaya, Uttarakhand, India". *Int. J. Bioassays* 5(6): 4589–4592.

Abstract: The present study was conducted in the Thalisain block of Pauri Garhwal to document the medicinal plants used by the local communities. 53 plant species distributed in 38 families were documented. Of the total plant species 49% were herbs, 26% trees, 23% shrubs and 2% climbers. 16 different plant parts were used by local communities for different ailments. Medicinal plants were widely used by major sections of the community against common colds, cough, skin diseases, snake bite, fever, joint pains, bronchitis etc. Women and local healers called vaids have a vital role in environmental management due to traditional knowledge and use of plants as medicine with undocumented knowledge. It has been observed as one of the best option of sustainable livelihoods for the residents of the area.

2881. **Rawat, V.S. & Jalal, J.S. 2011.** "Sustainable utilization of medicinal plants by local community of Uttarkashi district of Garhwal Himalaya, India". *European J. Med. Pl.* 1(2): 18–25.

Abstract: A study was conducted in the Uttarkashi district of Garhwal, Himalaya, India to document the medicinal plants used by the local communities. 56 plant species distributed in 46 families were documented. Of the total plant species 52% were herbs, 25% trees, 20% shrubs and 3% climbers. 17 different plant parts were used by local communities for different ailments. Some of the plants viz. *Aconitum hterophyllum*, *Angelica glauca*, *Commiphora mukul*, *Dactylorhiza hatagirea*, *Picrorhiza kurroa* and *Saussurea costus* are very rare in the wild. *Zanthoxylum armatum*, *Rumex nepalensis*, *Cinnamomum tamala*, *Zingiber officinale*, *Allium sativum* and *Angelica glauca* were the preferred medicinal plant species. The main indications for plants use were against common colds, asthma, skin and liver diseases.

2882. **Rawat, V.S., Rawat, Y.S. & Shah, S. 2010.** "Indigenous knowledge and sustainable development in the Tons valley of Garhwal Himalaya". *J. Med. Pl. Res.* 4(19): 2043–2047.

Abstract: The inhabitants of the Tones Valley have survived on their traditional management practices for their needs. The paper has looked at traditional systems

of forestry and agricultural system management in the west-central Himalayan region. Based on a detailed analysis of traditional knowledge that is linked with biodiversity, natural and human-managed, various possibilities for sustainable management of natural resources, with concerns for sustainable livelihood of local communities have been explored for the tribal region in Tons Valley. It is concluded that, if the development interests of local people are marginalized for a long period of time, they might adopt actions detrimental to the goal of conservation. Capitalization of the positive dimensions of traditional knowledge and overcoming its negative dimensions through conventional science-based inputs could ease the difficult process of securing people's participation in environmental conservation and management together with the socioeconomic development of local communities.

2883. **Renu, Narain, S., Rawat, A., Kaur, J., Kumar, S. & Fatima, N. 2018.** "Taxonomy, phytochemistry, pharmacology and traditional uses of *Flueggea virosa* (Roxb. ex Willd.) Royle: A Review". *Int. J. Life Sci.* 6(2): 579–585.

Abstract: *Flueggea virosa* (Roxb. ex Willd.) Royle. of family Euphorbiaceae is commonly grown medicinal plant. The plant contains large number of phytochemicals such as alkaloids, triterpenoids, resins, steroids, cardiac glycosides, bergenin, menisdaurin and anthraquinones. The study revealed the plant to be a potential source of nutrition, mineral and drugs. This review aims to provide an up to date overview of the phytochemistry, pharmacological data as well as traditional uses of the plant in view of discussing its medicinal value and potential application in complementary and alternative medicine.

2884. **Roy, B., Farooquee, Nehal A., Sharma, S. & Palni, L.M.S. 2002.** "Indigenous knowledge of wool dyeing: A Bhotiya practice on its way out in the higher Kumaun Himalaya". *Indian J. Tradit. Knowl.* 1(1): 40–46.

Abstract: The indigenous knowledge of making natural dye from native plant species had developed in the high altitude regions of Kumaun over a long period of time. This practice of using natural dyes for colouring wool was very common in the high altitude districts of Pithoragarh in Kumaun, and Chamoli and Uttarkashi districts in Garhwal. The inhabitants had perfected their knowledge to such a level, that they could get most of the bright shades of colours required in their woollen products. However, over a period of time, due to the expansion of road network and market forces in these regions, the avail ability of synthetic dyes slowly brought down the production and use of natural dyes. Later, the supply of factory-made wool in a multiple range of colours and shades at a price lower than that of their own-produced wool finally brought this knowledge system on the verge of its extinction. This paper highlights the role of various economic factors and linkages involved in the marginalisation of this practice and eco-friendly knowledge systems of a remote Himalayan region.

2885. **Sachan, A.K., Gupta, A., Kumar, M. & Sachan, N.K. 2015.** "Ethno-medicinal flora vis-à-vis agro-climatic conditions of Uttar Pradesh". *J. Med. Pl. Stud.* 3(4): 48–53.

Abstract: Medicinal plants are viewed as possible bridge between sustainable economic development, affordable health care and conservation of biodiversity.

The present paper deals with enumeration of medicinally important plants grown in different districts of Uttar Pradesh for treatment of different ailments such as cold, cough, fever, gastro intestinal disorders, etc. This study provides immense scope for biochemical analysis and screening of the active principle of the medicinal plants present in Uttar Pradesh for futuristic growth in the field of drug development.

2886. **Saini, D.C. 1996.** "Ethnobotany of Tharus of Basti district, Uttar Pradesh". *J. Econ. Taxon. Bot.,* Addl. Ser. 12: 138–153.

Abstract: The Tharus belongs to Mongoloid race are the chief tribal community of terai region of Eastern Uttar Pradesh. They live in and around the dense forests. The present study deals with new or less known uses of 254 plants among the Tharus of Basti district, Uttar Pradesh. The informations on local names and uses have been presented.

2887. **Saklani, A. & Rao, R.R. 1996.** "Role of Brahmkamal [*Saussurea obvallata* (DC.) Edgew.] in the life and culture of Garhwalis". *Ethnobotany* 8: 75–78.

Abstract: Brahmkamal [*Saussurea obvallata* (DC.) Edgew.- Asteraceae], often known as 'hot house' plant, is the 'State flower of Uttar Pradesh'. It is consideredsacred and is offered in large quantities at the shrines of Badrinath, Kedarnath and other temples in Garhwal. It has been admired in various folk songs, folk tales and more importantly in local festivals, apart from its uses in ethnomedicine. The ruthless collection of flowers (capitulum) by local people and tourists coupled with habitat destruction has rendered the species endangered. The impact of over-collection of Brahmkamal from the natural alpine ecosystem is discussed and strategies for its conservation and sustainable utilization are suggested.

2888. **Saklani, D. 2003.** Ethnic communities and ethnomedicine in Uttaranchal hills. In: Agrawal, C.M. (Ed.), *Dimentions of Uttaranchal.* Indian Publishers & Distributors, New Delhi. Pp. 329–353.

2889. **Saklani, P.M. 1998.** "Traditional practices and knowledge of wild plants among the ethnic communities of Garhwal Himalaya". *Puratattva* 29: 89–99.

2890. **Samal, P.K., Dhyani, P.P. & Dollo, M. 2010.** "Indigenous medicinal practices of Bhotia tribal community in Indian Central Himalaya". *Indian J. Tradit. Knowl.* 9(2): 256–260.

Abstract: Indigenous medicine is an important component of indigenous knowledge system, which is widely practiced by tribal communities all across the India. The paper describes the relevance of indigenous medicine and healthcare practices prevalent among the Bhotia tribe in Indian Central Himalaya, in terms of their contribution to physical well being of this tribal people. Documentation of more than 40 indigenous medicinal practices revealed that this indigenous knowledge system of medicine effectively serves to the tribal people. However, what is disturbing is the disappearance of the medicinal plants from their habitat under intense anthropogenic pressure and also because of high level commercial use, posing a serious threat to the continuation of indigenous medicinal practices, which may have adverse impacts on physical, social and economic well being of the tribal people.

2891. **Samant, S.S. & Dhar, U. 1997.** "Diversity, endemism and economic potential of wild edible plants of Indian Himalaya". *Int. J Sustain. Develop. & World Ecol.* 4(3): 179–191.

Abstract: The rich plant diversity of the Indian Himalaya is utilized by the native communities in various forms as medicine, edible/food, fodder, fuel, timber, agricultural tools, etc. Among these, wild edible plants form an important source as a supplement/ substitute food in times of scarcity for native communities. Because land holdings are small and subsistence agriculture prevails, the natives gather many wild plants for food. This paper presents an inventory of wild edible plants of Indian Himalaya used by local communities. Over 675 wild plant species, representing 384 genera and 149 families, are used as food/edible and their various parts are either consumed raw, roasted, boiled, fried, cooked or in the form of oil, spice, seasoning material, jams, pickles, etc. The species were analysed for diversity in different phytogeographical provinces, altitudinal distribution, endemism, origin and potentials. West Himalaya shows the highest diversity (50.96%) of edible plants and East Himalaya the maximum number of endemics (18 taxa) and wild relatives of economic plants (39 taxa). Mass scale propagation, dissemination of information packages to local inhabitants to ensure that wild edibles remain as a resource for income generation, and strategies for conservation and management are recommended.

2892. **Samant, S.S. & Mehta, I.S. 1994.** The folklore medicinal plants of Johar valley. In: Gupta, B.K. (Ed.), *Higher Plants of Indian Subcontinent [Indian J. Forest.* Addl. Ser.] 3: 143–159. Bishen Singh Mahendra Pal Singh, Dehradun.

Abstract: A total of 80 plants (78 angiosperms and 2 gymnosperms) are being utilized by the local inhabitants of Johar valley.

2893. **Samant, S.S. & Pal, M. 2003.** "Diversity and conservation status of medicinal plants in Uttaranchal state". *Indian Forester* 129(9): 1090–1108.

Abstract: The Uttaranchal State is located in the Indian western Himalayan Region (IHR). Like other provinces of the IHR this region is also known for rich biodiversity. The rich plant diversity of the region has been in use since the Vedic Period. Most of the medicinal plants are being extracted for drug and pharmaceutical industries from wild populations. This has adversely affected the very existence of a number of plants of high commercial value. Further, with the increasing world demand and renewed global interest in traditional ethnopharmacy coupled with the increasing preference for natural substances in the health care system, the natural stock of medicinal plants of the State is under tremendous pressure. Majority of the species are used in Ayurvedic, Unani and other traditional systems of medicine and also in the plant based pharmaceutical industries. In view of the importance of medicinal plants of the region, it has become necessary to review the diversity and conservation status of medicinal plants of Uttaranchal State. The present study recorded 701 species of medicinal plants. Of these 138 species were trees, 135 species were shrubs, 421 species were herbs and 7 species were ferns. Among the families Asteraeeae, Fabaceae, Lamiaceae, Apiaceae, and Orchidaceae and among the genera *Euphorbia, Polygonum, Allium, Ficus, Berberis, Swertia* and *Cassia* showed the maximum representation of the species. Sixty six families were monotypic. Whole plants (179 spp.), roots (120 spp.), leaves (56 spp.), fruits (12 spp.), seeds (25 spp.), flowers (10 spp.) and combinations of different parts (299 spp.) were used for the treatment of

various ailments. Maximum diversity of medicinal plants was distributed in the zone of < 1800 m and gradually decreased with the increasing altitude. 178 species were native to the Himalayan region, 9 species were endemic and 104 species were near endemic. Seven species i.e., *Saussurea costus* (Endangered), *Allium stracheyi, Berberis affinis, Dioscorea deltoidea, Nardostachys grandiflora*, and *Picrorhiza kurrooa* (Vulnerable), and *Pittosporum eriocarpum* (Indeterminate) have been recorded in the *Red Data Book of Indian Plants*. Using new IUCN criteria these species along with others have been also categorized as Critically Endangered (18 spp.), Endangered (18 spp.), Vulnerable (22 spp.), Low Risk - Near Threatened (6 spp.) and Low Risk - Least Concern (I species). *In- situ* and *ex- situ* conservation initiatives have been also highlighted. Based on the distribution and potential values medicinal plants have been prioritized for cultivation in different altitude zones. Furthcr, appropriate action plan for the conservation and management of medicinal plants has been suggested.

2894. **Samant, S.S. & Palni, L.M.S. 2000.** "Diversity, distribution and indigenous uses of essential oil yielding medicinal plants of Indian Himalayan Region". *J. Med. Aromat. Pl. Sci.* 22: 671–684.

2895. **Samant, S.S. & Palni, L.M.S. 2002.** *Himalayan Medicinal Plants– Potential and Prospects*. Himvikas Publication No. 14. G.B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora.

2896. **Samant, S.S. & Pant, S. 2003.** "Diversity, distribution pattern and traditional knowledge of sacred plants in Indian Himalayan region". *Indian J. Forest.* 26(3): 222–234.

Abstract: Present study deals with the diversity, distribution and traditional knowledge of sacred plants of the Indian Himalayan region. A total of 155 species belonging to 70 families and 125 genera have been recorded. Of these 59 species are trees, 30 species are shrubs and 66 species are herbs. Along an altitudinal gradient maximum number of sacred plants (i.e. 118) are distributed in the zone < 1800 m; 33 species are native, one species i.e. *Pleurospermum densiflorum* is endemic and 14 species are near endemic. Fifteen species have been categorised as Critically Endangered (5 spp.), Endagered (4 spp.), Vulnerable (3 spp.). Low Risk- Near Threatened (2 spp.) and Low Risk-Least Concern (1 sp.). Traditionally, various parts of the plants such as whole plants (78 spp.), flowers (27 spp.), leaves (19 spp.) seeds (8 spp.), roots/rhizomes 911 spp.), stems (7 spp.), wood (6 spp.), fibres (2 spp.) and inflorescence and twig (1 sp.) are used in different religious ceremonies and social rites. Development of an appropriate strategy for the conservation and sustainable utilization of sacred plants is suggested.

2897. **Samant, S.S., Dhar, U. & Palni, L.M.S. 1998.** *Medicinal Plants of Indian Himalaya: Diversity, Distribution and Potential Value*. Himvikas Publication No. 13. Gyanodaya Prakashan, Nainital.

2898. **Samant, S.S., Dhar, U. & Palni, L.M.S. 2001.** *Himalayan Medicinal Plants: Potential and Prospects*. Gyanodaya Prakashan, Nainital.

2899. **Samant, S.S., Dhar, U. & Rawal, R.S. 1996.** "Natural resource use by some natives within Nanda Devi Biosphere Reserve in West Himalaya". *Ethnobotany* 8: 40–50.

Abstract: The Nanda Devi Biosphere Reserve (2236.74 sq. km., altitude range 1900-7817 m) represents a diversity of ecosystems, communities and species. On account of its great biological diversity, the reserve has been declared as a World Heritage Site. While the core zone of the reserve is protected, the buffer zone os open for multiple uses and is inhabited by a population of about 2400 in 15 villages. The inhabitants are mainly of Indo-Mongoloid (Bhotia) and Indo-Aryan origin. The traditional altitudinal migration of these people is still in vogue and most of their winter settlements are located outside the reserve. They have been collected various types of plants for fodder, fuel, food, medicine, etc., causing rapid depletion of resources. Of the 130 identified species, 76 are used for food (edible), 26 for medicine, 30 for fodder, 25 for fuel, 11 for agricultural tools, 9 for house building, and the rest for other purposes. Their rarity is analysed and aspects of conservation and management are discussed.

2900. **Samant, S.S., Dhar, U. & Rawal, R.S. 2001a.** "Diversity, rarity and economic importance of wild edible plants of West Himalaya". *Indian J. Forest.* 24(2): 256–264.

Abstract: West Himalaya supports rich plant diversity of ethnobotanical importance. The native communities use this rich diversity in various forms. In the present study an inventory of 344 species of wild edible belonging to 219 genera and 117 families was made and information on taxonomic description, life forms, method of propagation, utilization, etc. was gathered. These edibles were analysed for diversity, sensitivity and economic value. The maximum diversity (159:46.22%) exists in the zone 1001-2000 m and lowest (19:5.53%) in the zone 4001-5000 m. Thirty two species (9.30%) fall under rarity class 1, 31 (9.01%) under rarity class 2, indicating their threatened status and 161 (46.80%) under rarity class 8 suggesting availability of a large resource base for the sustainable utilization of the inhabitants. Thirty four species are source of income generation and 26 species are of multiple utility. Conservation and management of these species is focused.

2901. **Samant, S.S., Dhar, U. & Rawal, R.S. 2001b.** Diversity and conservation of wild edible plants of the Indian Himalaya. In: Samant, S.S., Dhar, U. & Palni, L.M.S. (Eds.), *Plant Diversity of the Himalaya*. Gyanodaya Prakashan, Nainital. Pp. 474–482.

2902. **Samant, S.S., Dhar, U. & Rawal, R.S. 2002.** Diversity, distribution and conservation of threatened medicinal plants of Askot Wildlife Sanctuary in west Himalaya: Conservation and management perspectives. In: Samant, S.S., Dhar, U. & Palni, L.M.S. (Eds.), *Himalayan Medicinal Plants: Potential and Prospects*. Gyanodaya Prakashan, Nainital.

2903. **Satyal, G.S., Samant, S.S. & Kumar, K. 2002.** "Indigenous knowledge and conservation of medicinal plants used by the Bhotia tribes in Kumaun Himalaya". *Int. J. Sustain. Develop. & World Ecol.* 9(2): 159–166.

Abstract: The present study deals with indigenous knowledge on 34 medicinal plants of Kumaun Higher Himalaya used by the Bhotia tribes. Most of the species are native to the Himalayan region. *Angelica glauca* and *Allium stracheyi* are narrow range endemic and *Allium stracheyi, Picrorhiza kurrooa* and *Nardostachys grandiflora* have been recorded in the Red Data Book of Indian Plants. Apart from indigenous uses,

the majority of the species are used in the pharmaceutical industry and a few are among the major sources of income generation. The annual production of medicinal plants is comparable with the annual production of traditional crops. Hence, development of proper agro-techniques for cultivation, harvesting in the proper season and in situ conservation of these species is envisaged.

2904. **Sawan, S., Bisht, S.L. & Joshi, S.P. 2011.** "Ethno-medico studies of some shrubs from fresh water swamps forest of Doon valley, Uttarakhand". *Ann. Forest.* 19(2): 256–263.

Abstract: The present paper deals with the ethnomedicinal shrubs used by the villagers of Golatappar fresh water swamp forest of Dehra Dun, Uttarakhand. The investigation revealed the medicinal properties of 24 species belonging to 23 genera under 16 families. In this study the most dominant family was Verbenaceae (5 species) followed by Rutaceae (3 species), Lamiaceae and Apocynaceae (2 species each). Other 12 families contributed one species each. Different parts of plants were used as medicine by the villagers to cure various respiratory diseases, diabetes, rheumatic pain, jaundice, skin diseases, fever, dysentery, dropsy, etc. Among thes leaves (12 species) were frequently used in various treatment, followed by root (8 species), fruit (5 species), bark, seed and flower (3 species), whole plant (2 species) and stems, young twigs (1 species). The taxa with ethno-medicinal uses are arranged here alphabetically wit botanical name, local name, family, flowering and fruiting period, parts used and uses.

2905. **Saxena, A.P. & Vyas, K.M. 1981a.** "Ethnobotanical records on infectious diseases from tribals of Banda district (U.P.)". *J. Econ. Taxon. Bot.* 2: 191–194.

Abstract: Ethnobotanical studies are of great medicinal importance. A survey of seventeen villages of Banda district was carried out. The uses of twenty plant species by the tribals of different localities for the treatment of their infectious diseases were recorded. The species have been arranged alphabetically under their respective families arranged according to Bentham & Hooker's system of classification. Local names are given in parenthesis following their botanical names.

2906. **Saxena, A.P. & Vyas, K.M. 1981b.** "Treatment of leprosy and leucoderma by the tribals of Bundelkhand in Uttar Pradesh". *J. Res. Ayurv. & Siddha* 2(2): 85–90.

2907. **Saxena, A.P. & Vyas, K.M. 1983.** "Ethnobotany of Dhasan valley". *J. Econ. Taxon. Bot.* 4: 121–128.

Abstract: The present paper deals with the medicinal importance of 60 plants species being used by the local people of 'Dhasan Valley' (Bundelkhand region) for the treatment of some important diseases. The valley is formed by sloping and elevated banks of the river 'Dhasan' dominated by dense forests with various medicinal plants.

2908. **Saxena, N., Yadav, V.K. & Verma, R.K. 2014.** "Traditional knowledge of medicinal plants used to cure gastrointestinal problems in Jalaun district of Uttar Pradesh, India". *J. Med. Pl. Stud.* 2(4): 24–28.

Abstract: The present study documents the traditional knowledge of medicinal plants that are in use for gastro intestinal ailments prevailing in Jalaun district of Bundelkhand,

U.P., India. Ethnomedicinal uses of 25 plant species along with their botanical name, vernacular name, family name and mode of administration are presented. They belong to 23 genera and 22 families. These plants used to cure 14 types of gastro intestinal ailments. The study emphasizes the potentials of the ethnobotanical research and the need for the documentation of traditional knowledge pertaining to the medicinal plants utilization for the greater benefit of mankind.

2909. **Saxena, S.K. & Tripathi, J.P. 1989.** "Ethnobotany of Bundelkhand– Studies on the medicinal uses of wild trees by the tribals inhabitants of Bundelkhand region". *J. Econ. Taxon. Bot.* 13(2): 381–389.

Abstract: The present paper deals with the trees which are being used by the tribals of Bundelkhand region of central India foe curing their diseases and relieving physical sufferings. Uses of 42 tree species covering 23 angiospermic families are discussed in the present communication with their vernacular names, families, botanical names, plant prts which are used medicinally, general properties and medicinal uses. The folk uses of the tree discussed here are original and it seems not o have been available elsewhere in the published literature. An index of diseases and uses is provided in the text.

2910. **Saxena, S.K. & Tripathi, J.P. 1990.** "Ethnobotany of Bundelkhand II– Folklore therapy through herbs among inopulent parishioners and aboriginl tribes". *J. Econ. Taxon. Bot.* 14(2): 263–270.

Abstract: The aboriginal tribes and poor villagers of Bundelkhand region recognize and utilize fairly a large number of plants and natural plant products directly as drugs. Painstaking interrogations of the tribals during surveys brought forward a wealth of knowledge of medicinal properties of plants. The present communication provides a useful information on some herb having therapeutic values and their uses. A special feature, which will not fail to attract attention, is the inclusion of brief description of the active principles of herbs so far as they have been worked out.

2911. **Semwal, D.P. & Saradhi, P.P. 2008.** "Ethnobotanical studies in Kedarnath Wildlife Sanctuary, central Himalayas, India". *J. Econ. Taxon. Bot.* 32(Suppl.): 48–57.

Abstract: An ethnobotanical survey along with botanical collections was made in selected villages of the Kedarnath Wildlife Sanctuary, central Himalayas, India. The information regarding use of plant species for food, medicine, dye, fuel and construction materials, as well as for miscellaneous uses was collected and classified systematically. A total of 86 ethnobotanic ally important plant species were screened from the present study area, which belong to 74 genera and 54 families. Of the 48 food plants, 21 (43.7%) species provide edible fruits, 12 (25%) edible leaves, 8 (17.6%) edible flower/flowers buds, 3 (6.25%) provide all aerial parts, 1 species each (2.08%) provides edible roots, rhizome, seed and bark. Further, about 19 species have found multiple uses in the aea. It is suggested that conservation measures are essentially required for sustainable use of these valuable resources.

2912. **Semwal, D.P., Saradhi, P.P., Kala, C.P. & Sajwan, B.S. 2010.** "Medicinal plants used by local Vaidyas in Ukhimath block, Uttarakhand". *Indian J. Tradit. Knowl.* 9(3): 480–485.

Abstract: Throughout the Indian sub-continent, all earlier medical branches have developed and refined different treatments based on preparations made from available natural resources. Traditional knowledge of local Vaidyas (practitioners of Ayurveda) about medicinal plants and their importance in local healthcare practices is well known since Vedic time. However, mode of applications of the different medicinal plants is lacking from many remote areas of the country. The research work was initiated in the vicinity of Ukhimath (block head) of Uttarakhand state, as it has unique habitat specificity and availability of Vaidyas. Of 60 different plant species collected, 45 herbs, 8 trees, 5 shrubs and 2 climbers were used for curing a total of 34 diseases such as headache, fever and intestinal problems. Rhizome/tuber/roots (41.66%), followed by leaves (31.66%), fruits/seeds (15%), twigs/barks (6.66%), flowers (3.33%) and whole plant (1.66%) were used for curing different ailments. A total of 8 medicinal plants such as *Aconitum heterophyllum, Angelica glauca, Berberis osmastonii, Dactylorhiza hatagirea, Nardostachys jatamansi, Picrorhiza kurrooa, Podophyllum hexandrum* and *Zanthoxylum armatum* were rare and endangered species, which had high demand in the market and showed greater potential towards curing of ailments. Thus, there is an urgent need to conserve such medicinal plant species for the benefit of humankind.

2913. **Semwal, D.P., Saradhi, P.P., Nautiyal, B.P. & Bhatt, A.B. 2007.** "Current status, distribution and conservation of rare and endangered medicinal plants (REMP) of Kedarnath Wildlife Sanctuary, Central Himalayas, India". *Curr. Sci.* 92(12): 1733–1738.

Abstract: Assessment of population structure on the basis of density, distribution and diversity-dominance pattern was carried out in Kedarnath Wildlife Sanctuary, Uttarakhand, India. Besides, distribution pattern, population structure and conservation status of ten rare and endangered medicinal plants were also evaluated. Different habitat types for these species were identified and sampled using vertical belt transects. Out of ten habitats identified, distribution of most of the species was found to be restricted in 2-3 habitats. However, *Picrorhiza kurrooa* showed wide distribution in six habitats, while *Swertia chirayita* was restricted to a single habitat. On the basis of density, occurrence in different habitats and level of pressure, we have grouped them into two broad categories: (i) restricted distribution and high pressure, and (ii) well distributed and low pressure. Accordingly, implication of conservation and management strategies has been suggested.

2914. **Semwal, D.P., Bhatt, K.C., Mamgain, A., Uniyal, P.L. & Bahuguna, Y.M. 2013.** "Role of potential ethno-medicinal plants resources of Kalimath valley (district Rudraprayag) Uttarakhand, India in health care". *Med. Pl. Int. J Phytomed. & Related Industries* 5(4): 223–230.

Abstract: The present communication deals with the documentation of traditional medicines used by the local people/Vaidyas inhabiting in Kalimath valley of district Rudraprayag, Uttarakhand. The local Vaidyas who are likely to disappear from the society were approached to record such tresure of traditional knowledge. A total of 75 ethnomedicinal plant species (belonging to 37 families and 55 genera) including rare, endangered and threatened species are used by the native people for the treatment of over 25 ailments ranging from headache to highly complicated heart problems. Among the plant parts utilized in treatment of ailments, leaves (41.33%) were recorded as most utilized plants parts followed by rhizome/root/tuber (38.66%), fruit/seed (25.33%), and stem/bark (20%). As far as major part of plant species in the treatment of different ailments is concerned, 31 species have their role in the treatment of stomach disorder, 19 species in fever and for injuries and wounds 18 species used by the local communities.

2915. **Semwal, J.K. & Gaur, R.D. 1985.** "Some endangered high altitude plants of Garhwal Himalaya". *Acta Bot. Ind.* 13: 257–258.

2916. **Shah, K.K., Palvi, S.K. & Singh, H. 1980.** "Survey of some medicinal plants of Dharchula block in Pithoragarh district of U.P.". *Bull. Med.-Ethno-Bot. Res.* 1: 8–24.

2917. **Shah, N.C. 1971.** "Medico-botany of Dronagiri - The mythic hill in Kumaon (U.P.)". *J. Res. Indian Med.* 8: 47–59.

2918. **Shah, N.C. 1975.** "Prospects of botanical drugs from hill districts of Uttar Pradesh". *Indian Drugs* 12(11): 17–20.

2919. **Shah, N.C. 1980.** "Traditional cultivation of Babunah: *Chamomilla recutita* (L.) Raushert, syn. (*Matricaria chamomilla* L.) in Lucknow". *Bull. Med.-Ethno-Bot. Res.* 1(4): 471–477.

2920. **Shah, N.C. 1982.** "Herbal folk medicines of Northern India". *J. Ethnopharmacol.* 6: 293–301.

Abstract: The herbal folk medicine in North India is commonly made available through the herbalists, elderly persons, sadhus (hermits), ojhas (village physicians practising witchcraft) and the tradiditional street vendors whether in the alpine region near the snows or in the arid region near the deserts. The northern part of India constitutes four main broad regions: the Montane region; the sub-Montane region; the Northern planins and the arid region. The very important herbal folk medicines which have been in vogue from ancient times in these regions, are discussed.

2921. **Shah, N.C. 1983.** Endangered medicinal and aromatic taxa of U.P. Himalaya. In: Jain, S.K. (Ed.), *An Assessment of Threatened Plants of India*. Botanical Survey of India, Calcutta. Pp. 40–49.

2922. **Shah, N.C. 1987.** *Ethnobotany in the Mountain Region of Kumaun Himalaya*. Ph.D. Thesis Kumaun University, Nainital, (unpublished).

2923. **Shah, N.C. 1994a.** *Ethnobotany of some well-known Himalayan Compositae.* Proceedings of the International Compositae Conference, New Biology and Utilization. Royle Botanic Gardens, Kew. Pp. 415–423.

2924. **Shah, N.C. 1994b.** Rajijs: A study oftheir social, ethnic, ethno-botanical and other relative aspects. In: Kappor, A.K. & Kapoor, S. (Eds.), *Ecology and Man in the Himalaya.* M.D. Publications Pvt. Ltd. Pp. 91–102.

2925. **Shah, N.C. 1997a.** "Ethnobotany of *Cannabis sativa* in Kumaun region, India". *Ethnobotany* 9: 117–121.

Abstract: *Cannabis sativa* L., one of the most important plants found wild and under cultivation in the Kumaon region of India, is used for various purposes. Seeds are

used as condiment, foodgrain and source of oil; stem for making hempen cloth, cordage, torch wood and fuel ignite; and resin (*attar*) from the dried floral leaves nd inflorescence as an intoxicant. The plant is lso used in a bonefire festival by the Kumaonis. The introduction of *Cannabis* from its centre of origin into the Kumaon region is discussed.

2926. **Shah, N.C. 1997b.** The status of essential oil bearing plants in Uttarakhand (U.P.), India. In: Handa, S.S. & Kaul, M.K. (Eds.), *Supplement to Cultivation and Utilization of Aromatic Plants*. RRL, Jammu. Pp. 485–503.

2927. **Shah, N.C. 2006.** "A historical and ethnobotanical study of *Nardostachys jatamansi*: An ancient incense and aromatic medicinal herb from Uttaranchal, India". *Ethnobotany* 18: 37–45.

Abstract: *Nardostachys jatamansi*, 'jatamansi' or 'Indian nard', is well-known in Indian since ancient times for its useful medicinal properties. It is also used in countries like Assyria (Mesopatamia) as its name is located in wedge-shaped cuneiform scipt in Egypt, Greece, Rome, etc. from times immemorial. History begins from the period of *Atharveda* and its export from India in 2500 BC; its association with Alexander, the Great; inclusion among Bible plants; and use as a royal perfume during the ime of Akbar, the Great. These are some of the testimonies which make 'spikenard' one of the most important herbs of the present era. Jatamansi was also reputed for various uses, such as a costly incense, perfume as unguent, in medicine as nervine tonic used in hysteria, epileptic fits, palpitation of heart etc. It was found to be hypotensive like *Rauvolfia serpentine*, but due to availability of insufficient raw material, this taxon could not find a proper place in modern medicine. The present article deals with various aspects of botany with nomeclatural history, eco-profile, phenology in Uttaranchal and distribution in India and other parts of the world. Local, trade, Sanskrit and common Englsh names and their etymology and philology are discussed.

2928. **Shah, N.C. 2013.** "Ethnobotanical lores from Kumaun culture of India". *Ethnobotany* 25: 69–77.

Abstract: Kumaon has its own culture, which includes living traditions, language, food, medicine, recipes and cuisines, local festivals, religious rites and ceremonies, besides others. The plants, birds and other animals play an important role in its culture and traditions. These are also offered to deities. Not only this, they are also used in the day to day conversations, in form of phrases, sayings, riddles and folk-tales. In this paper an effort has been made to describe 14 plant species, which are associated with Kumaoni culture. The plants have been given with their botanical names, the origin, species found in Kumaon and also other parts of India, wit their local names, folk or traditional uses and their use in idioms, phrases and riddles, folk-tales and festivals.

2929. **Shah, N.C. 2014.** "Ethnobiological Lores from the Kumaon Culture of India". *Sci. Tech. J.* 1(3): 28–36.

2930. **Shah, N.C. & Gupta, L.K. 1976.** "Useful medicinal plants of Ranikhet– I". *Indian Drugs* 14: 47–52.

2931. **Shah, N.C. & Jain, S.K. 1988.** "Ethno-medico botany of Kumaun Himalaya, India". *Social Pharmacol.* 2: 359–380.

2932. **Shah, N.C. & Joshi, M.C. 1971a.** "Folklore and aromatic plants of Kumaon Hills". *Flavour Industry* 61: 851–855.

2933. **Shah, N.C. & Joshi, M.C. 1971b.** "An ethnobotanical study of Kumaum region of India". *Econ. Bot.* 25: 414–422.

2934. **Shah, N.C. & Kapoor, L.D. 1978.** "Depletive medicinal plants of Kumaun Himalaya". *J. Res. Modern Ind. Yoga* & *Homeopathy* 13: 38–43.

2935. **Shah, R. 2003.** *Nature's Medicinal Plants of Uttaranchal,* Vol. 1 (Trees & Shrubs). Gyanodaya Prakashan, Nainital.

2936. **Shah, R. 2006.** *Nature's Medicinal Plants of Uttaranchal,* Vol. 2 (Herbs, Grasses & Ferns). Gyanodaya Prakashan, Nainital.

2937. **Shah, R. 2015.** *Edible Plants of North West Himalaya (Uttarakhand).* Uttarakhand Biodiversity Board and Bishen Singh Mahendra Pal Singh, Dehradun.

2938. **Shah, R., Pande, P.C. & Tiwari, L. 2008.** "Traditional veterinary herbal medicines of western part of Almora district, Uttarakhand Himalaya". *Indian J. Tradit. Knowl.* 7(2): 355–359.

Abstract: A preliminary survey of an age-old veterinary practice of the western part of Almora district, which is inhabited by hill communities, was made. The main emphasis was given to 24 most common livestock diseases and disorders. For the treatment of these veterinary diseases and disorders, locals use about 57 plants. The biomedicines are composed of single drug or combination of drugs. These medicines are presented disease wise. This type of traditional knowledge is a wealth for the human being and has great value in the context of today's Intellectual Property Rights (IPRs) scenario.

2939. **Shah, S., Ram, J., Pala, N.A. & Tripathi, P. 2013.** "Ecological status of medicinal plants in oak and mixed oak forests of Nainital catchment, Uttarakhand". *J. Non-Timber Forest Prod.* 20(3): 171–178.

Abstract: The present study was conducted in Oak dominated forests of Nainital in the Uttarakhand Himalaya, to assess the phytosociological attributes of medicinal plant species by randomly laying 10 quadrats of 10×10 m^2 for trees, 5×5 m^2 for shrubs and 1×1 m^2 for herbs across study area. The vegetation data recorded was quantitatively analysed for density, frequency, abundance to frequency ratio and Importance Value Index (IVI). Overall the density of trees ranged between 1.60 to 6.60 individuals/100m^2. Shrub density varied between 18.10 to 23.20 individuals/ 25m^2 while herb layer had a density ranging between 4.60 to 14.60 individuals/m^2. Among trees *Quercus leucotrichophora* was the most frequently distributed. Among shrubs, *Berberis* spp. and *Daphne papyracea* were the most frequent while most of the medicinal herbs were rare. *Litsea umbrosa* among trees while *Daphne papyracea* among shrubs were dominant in two of the selected sites, as evident from their higher IVI values. Among medicinal herbs *Ocimum basilicum* in Oak forest, *Smilax aspera* in Oak conifer forest and *Valeriana wallichii* in Oak mixed forest had maximum IVI.

Most of the species were contagiously distributed in all the study sites while random and regular distribution was less common.

2940. **Sharma, B.D. 2014.** *Himalayan Edible Medicinal Plants: Science and Traditional Wisdom*. Bishen Singh Mahendra Pal Singh, Dehradun.

2941. **Sharma, C., Kumari, T. & Arya K.R. 2014** "Ethnopharmacological survey on bone healing plants with special references to *Pholidota. articulata* and *Coelogyne cristata* (Orchidaceae) used in folk tradition of Kumaon, Uttarakhand, India". *Int. J. Pharma Res. & Health Sci.* 2(2): 185–190.

Abstract: This study was aimed to conduct an ethnopharmacological survey and document the medicinal plant used for healing fractures in folk tradition of Kumaon, Uttarakhand, India. The Ethnopharmacological survey study was conducted during March 2011 to November 20-12 by interviewing 60 informants including common villagers (VG) and herbal practitioners (HP) of Almora, Nainital, Bageshwar and Pithoragarh districts of Kumaon, Uttarakhand, India. Recorded information was further cross checked and verified through published literature The study provides a list of 15 genera belonging to 13 families used for the treatment of fractured bone in folk tradition of Kumaon, Uttarakhand, India, pertaining with detail ethnopharmacological data of *Pholidota articulata* Lindley and *Coelogyne cristata* Lindley (Orchidaceae), the most popular plants for healing fracture.

2942. **Sharma, E. & Gaur, A.K. 2012.** "*Aconitum balfourii* Stapf: a rare medicinal herb from Himalayan Alpine". *J. Med. Pl. Res.* 6(22): 3810–3817.

Abstract: *Aconitum* is a genus of flowering plant belonging to buttercup family (Ranunculaceae). Globally, there are over 300 species of *Aconitum*. In India, the genus is represented by about 24 species mainly distributed in subalpine and alpine zones of Himalayas. Out of these species, *Aconitum balfourii* Stapf, known as Mitha and Vatsnabh, is a significant species of this genus. It is widespread in Kumaon and Garhwal Himalayas on shady slopes from 3000 to 4200 m altitudes. Tuberous roots of *A. balfourii* Stapf are rich sources of pseudoaconitine (0.4 to 0.5%) and aconite alkaloids. The value of aconite as a medicine has been fully recognized in modern times, and it now ranks as one of the most useful drugs, particularly in Homeopathy, Ayurveda, and Unani systems of medicine. Due to overexploitation, A. balfourii Stapf is facing severe threat, and the plant has been listed among 37 Himalayan medicinal herbs under priority for *in situ* and *ex situ* conservation. This review mainly discussed several aspects, such as: distribution, cultivation, morphological characteristics, basis of origin, and conservation of this important species of the genus *Aconitum*.

2943. **Sharma, G. & Nautiyal, A.R. 2011.** "*Cinnamomum tamala:* A valuable tree from Himalayas". *Int. J. Med. Aromat. Pl.* 1(1): 1–4.

Abstract: *Cinnamomum tamala* known as tejpat / bay leaves in trade, found in Himalayan region, is a promising medi-cinal plant species. Its leaves are widely used as spice throughout the world since ancient times. It is used in Indian sys-tem of traditional medicines in various Ayurvedic formulations. Leaves and bark have aromatic, astringent, stimulant and carminative qualities and used in rheumatism, colic, diarrhea, nausea and vomiting. The essential oil of the leaves called tejpat oil is medicinally

used as carminative, anti-flatulent, diuretic, and in cardiac disorders. It is also used in pharmaceutical preparations because of its hypoglycemic, stimulant and carminative properties. Owing to its high medicinal value and being an important ingredient of the spices, the demand of C. *tamala* is increasing day by day. Therefore, species has been recommended for *in-situ* as well as *ex-situ* conservation with devising appropriate management plans. The genus C*innamomum* belonging to the family Lauraceae comprises 270 species which occur naturally in Asia and Australia. They are evergreen trees and shrubs and most species are aromatic and many are economically important. About 20 species occur in India (Anonymous 1950). The etymology is derived from the Greek word 'kinnamomon' (meaning spice). The Greeks borrowed the word from the Phoeni-cians, indicating that they traded with the East from early times. The specific epithet 'tamala' is after a local name of the plant in India. C*innamomum tamala* (Buch.-Ham.) Nees and Eber-maeir (Figure 1) is locally called as tej-pat/dalchini and known as tejpatra in Sanskrit (Kirtikar and Basu 1981). It is a medium-sized tree, found in India along the North-Western Himalayas, in Sikkim, Assam, Mizoram and Meghalaya. It is also found in tropical and sub-tropical Asia, Australia, Pacific region and South Asia (Brandis 1998; Showkat et al. 2004). It is distributed from near Indus to Bhutan (Hooker 1988). This evergreen species occurs as associated species in transitional evergreen broad leaf forest and is confined between sub-montane broad leaf ombrophilous forest (below 1000m) and mid montane broad leaf ombrophilous forest up to 3000m (Singh and Singh 1992). According to Gaur (1999) C. *tamala* commonly occurs on moist-shady ravine slopes, often asso-ciated with Oak-*Rhododendron* forests, from 500m to 2200m altitude in sub-montane and montane Himalaya.

2944. **Sharma, I.P., Kanta, C., Semwal, S.C. & Goswarni, N. 2017.** "Wild fruits of Uttarakhand (India): Ethnobotanical and medicinal uses". *Int. J. Complementary & Alt. Med.* 8(3):1–8.

Abstract: Fruit is a ripened ovary, it may either fleshy or nut and divided into cultivated as well as wild categories. Wild fruits are worldwide distributed and mostly found in the part of earth where anthropogenic activities are no or negligible. The use of Himalayan plant species for food and medicine has been known for a long time. Uttarakhand is one of these places which is suitable for wild edible fruiting plants because of their difficult geography and climatic conditions and awesome taste of fruits which are attracted by their people as a rich source of their nutrition. Wild edible plants are very important for the well being of rural populations in the region, not only as sources of supplemental food, nutritionally balanced diets, medicines, fodder and fuel, but also for their income generating potential. Large numbers of wild fruits along with their edible values also used in medicine and many other wild fruits *viz. Rubus ellipticus, Fragaria* × *ananassa, Prunus persica, Myrica esculenta* etc. have high nutritive quality and used by the local peoples for the different edible products. Such wild plants might be explore for their nutritional and medicinal properties and need to conserve for biodiversity maintenance.

2945. **Sharma, J. & Painuli, R.M. 2011.** "Plants used for the treatment of rheumatism by the Bhoxa tribe of district Dehradun, Uttarakhand, India". *Int. J. Med. Aromat. Pl.* 1(1): 28–32.

Abstract: In the present investigation an attempt has been made to explore traditional medicinal knowledge of plant species used against rheumatism by the Bhoxa tribe of district Dehradun. An ethnobotanical survey was carried out among the tribal people in all seasons to collect the relevant information about the medicinal uses of wild plants. Frequent field trips were made for the collection of plant specimens and information from traditional healers through questionnaire and interviews. The plant species used against rheumatism have been enumerated in the present paper and each species has been provided with scientific name, local name and crude drug preparation (as per details provided by the folklore. It was observed that the Bhoxa tribe used 22 wild plant species belonging to 19 families as a remedy for rheumatism.

2946. **Sharma, J., Gaur, R.D. & Painuli, R.M. 2010.** "A local beverage *Jaad* among the Tharu tribe of Lakhimpur district, Uttar Pradesh". *J. Econ. Taxon. Bot.* 34(4): 803–807.

Abstract: This communication presents indigenous knowledge of fermented local beverage (*Jaad*) used by the Tharu tribe of Lakhimpur district of U.P. Usage of alcoholic and non alcoholic beverages are common among Tharus of U.P. which play an important role in their festivals, ceremonies and socio-cultural life. This local drink is indigenously prepared by the fermentation of rice along with several components of different plant species. Through extensive field survey, interviews and participation in their socio-cultural activities, a detailed account of *Jaad* preparation by Tharu community has been highlighted in the foregoing text.

2947. **Sharma, J., Painuli, R.M. & Gaur, R.D. 2010.** "Plants used by the rural communities of district Shahjahanpur, Uttar Pradesh". *Indian J. Tradit. Knowl.* 9(4): 798–803.

Abstract: Throughout the globe, the traditional knowledge system has gained prime importance in context with conservation, sustainable development, and search for new utilization patterns of plant resources. In this context, the ethnomedicinal plants and the traditional healthcare system prevalent amongst the aboriginal and the rural population of various societies contribute significant role. Considering the importance of herbal medicines, the paper pertains to the studies conducted in the rural areas of Shahjahanpur district, Uttar Pradesh. The study is based on extensive field surveys, plant collection, and the interviews with the local folks particularly the Vaidhyas, women folk, and the senior inhabitants. In all, over 70 plant species belonging to 32 families have been enumerated, which are found to be of common use by the locales.

2948. **Sharma, J., Gairola, S., Gaur, K.D. & Painuli, R.M. 2012.** "The treatment of jaundice with medicinal plants in indigenous communities of the Sub-Himalayan region of Uttarakhand, India". *J. Ethnopharmacol.* 143(1): 262–291.

Abstract: A total of 40 medicinal plants belonging to 31 families and 38 genera were recorded to be used by the studied communities in 45 formulations as a remedy of jaundice. Bhoxa, nomadic Gujjars and Tharu communities used 15, 23 and 9 plants, respectively. To our knowledge eight plants reported in the present survey viz., *Amaranthus spinosus* L., *Cissampelos pareira* L., *Ehretia laevis* Roxb., *Holarrhena pubescens* Wall., *Ocimum americanum* L., *Physalis divaricata* D. Don, *Solanum incanum* L. and *Trichosanthes cucumerina* L. have not been reported earlier as remedy of jaundice in India. Literature review revealed that a total of 214 (belonging to 181

genus and 78 families), 19 (belonging to 18 genus and 12 families) and 14 (belonging to 14 genus and 11 families) plant species are used as internal, external and magico-religious remedies for jaundice, respectively by various communities in different parts of India. Most widely used hepatoprotective plant species for treatment of jaundice in India is *Boerhavia diffusa* L. followed by *Tinospora cordifolia* (Willd.) Miers, *Saccharum officinarum* L., *Phyllanthus amarus* Schumach. & Thonn., *Ricinus communis* L., *Andrographis paniculata* (Burm. f.) Nees, *Oroxylum indicum* (L.) Kurz, *Lawsonia inermis* L. and *Eclipta prostrata* (L.) L.

2949. **Sharma, J., Gairola, S., Gaur, R.D. & Painuli, R.M. 2011.** "Medicinal plants used for primary healthcare by Tharu tribe of Udham Singh Nagar, Uttarakhand, India". *Int. J. Med. Aromat. Pl.* 1(3): 228–233.

Abstract: The present study highlights the traditional knowledge of Tharu tribe related with the uses of plants as ethnomedicine. Extensive field trips were conducted in order to collect the ethnobotanical information. Questionnaire was made to gather data for local name, part used, disease treated, mode of administration and methods of preparation. The present article gives a brief account of 53 plant species belonging to 52 genera and 34 families used as herbal remedies by Tharu tribe of Udham Singh Nagar of Uttarakhand.

2950. **Sharma, J., Gairola, S., Gaur, R.D. & Painuli, R.M. 2012.** "Forest utilization patterns and socio-economic status of the Van Gujjar tribe in Sub-Himalayan tracts of Uttarakhand, India". *Forest Studies China* 14: 36–46.

Abstract: The present study was conducted on the Van Gujjar tribe inhabiting a sub-Himalayan tract in the North Western Himalayas of Uttarakhand State, India. The Van Gujjars have been practicing transmigration over hundreds of years. They migrate each year with their households and livestock between summer and winter pastures. A few years ago with the announcement of the establishment of the Rajaji National Park, the tribe has been forced out of the forest area and rehabilitated outside the park, which has affected their lifestyle. The newly established rehabilitation colony in the Gandikhata area of Haridwar District of Uttarakhand State was taken as a case study. The aims of the present study were to understand and evaluate the socio-economic status of the Van Gujjars in their newly established rehabilitation colony, the utilization pattern of forest resources by the tribe and their relative preference for selective trees for various uses. A total of 176 households were interviewed (giving equal weight to all economic classes and family every size) by using pre-structured questionnaires. The education level was very low (12.9%) and the average income per household was recorded as Rs. 36000 (approximately $ 803) per year. The major source of income was dairy production (80.6%) followed by labor employment (13.9%), NTFPs (4.2%) and agricultural production (1.4%). More than 90% of fuel wood and fodder is extracted from the forest. The average fuel wood and fodder consumptions per household per day were recorded as 25.86 and 21.58 kg, respectively. A total of 35 species of cultivated plants and 89 species of wild plants were found to be utilized as food sources. Selectively 25 wild tree species are well known as being used by the Van Gujjars as fodder, fuel wood, agricultural implements, household articles, dye, medicine, fiber and other products. According to their utility value, the most preferred and useful tree species is *Ougeinia oojeinensis*, followed by *Terminalia alata, Bombax ceiba, Shorea robusta* and *Dalbergia sissoo*.

2951. **Sharma, J., Gairola, S., Sharma, Y.P. & Gaur, R.D. 2014.** "Ethnomedicinal plants used to treat skin diseases by Tharu community of district Udham Singh Nagar, Uttarakhand, India". *J. Ethnopharmacol.* 158: 140–206.

Abstract: Ethnomedicinal survey was conducted in different villages of Tharu community located in district Udham Singh Nagar, Uttarakhand, India. Ethnomedicinal information on plants used to treat various skin diseases was collected from 122 individuals (93 males and 29 females), including 35 experienced herbal practitioners and 87 local villagers. For each of the recorded plant species the use value (UV) and fidelity level (FL) was calculated. The informant consensus factor (F_{ic}) was also calculated to find out the homogeneity in the information given by the informants. 90 plant species belonging to 86 genera and 48 families were used by the Tharu community to treat various skin diseases *viz.*, wounds (38 spp.), boils (32 spp.), cuts (18 spp.), leprosy (11 spp.), eczema (10 spp.), itching (7 spp.), ringworm (5 spp.), burns (4 spp.), leucoderma (4 spp.), cracked heels (2 spp.), dandruff (3 spp.), body infection (2 spp.), chilblains (2 spp.), hair fall (2 spp.) and toes infection (2 spp.). Information on botanical name, family, vernacular name, ailments treated, mode and dose of herbal preparations, *UV* and *FL* values are provided for each of the recorded species. According to *UV* value most preferred plant species used to treat skin diseases by Tharu community was *Ricinus communis* L. followed by *Tridax procumbens* (L.) L., *Azadirachta indica* A. Juss., *Ageratum conyzoides* (L.) L. and *Allium cepa* L.

2952. **Sharma, J., Gairola, S., Gaur, R.D., Painuli, R.M. & Siddiqi, T.O. 2013.** "Ethnomedicinal plants used for treating epilepsy by indigenous communities of sub-Himalayan region of Uttarakhand, India". *J. Ethnopharmacol.* 150(1): 353–370.

Abstract: Although many plants are claimed to possess anticonvulsant/antiepileptic (AC/AE) properties, but there is very little information available about plants used by various ethnic communities in different parts of India to treat epilepsy, one of the most common disorders of central nervous system (CNS); this communication provides significant ethnomedicinal information on the plants used by indigenous communities: Bhoxa, Tharu and nomadic Gujjars of sub-Himalayan region, Uttarakhand, India to treat epilepsy, so that it could be used as a baseline data for studying chemical constituents and biological activities of these promising plants.

2953. **Sharma, J., Gaur, R.D., Gairola, S., Painuli, R.M. & Siddiqi, T.O. 2013.** "Traditional herbal medicines used for the treatment of skin disorders by the Gujjar tribe of sub-Himalayan tract, Uttarakhand". *Indian J. Tradit. Knowl.* 12(4): 736–746.

Abstract: In the present investigation, an attempt has been made to explore the traditional knowledge on herbal medicines used as a remedy for skin disorders by the Gujjar tribe of Sub-Himalayan tract, Uttarakhand. The purpose of this study is to assess traditional knowledge on medicinal plants which forms a baseline data for future pharmacological and phytochemical studies, to identify the important species used for skin medicine, finding out methods for various preparations, and calculate

the % informants in relation to medicinal plant use. In this study frequent field trips were made for the collection of plant specimens and information on medicinal aspects from traditional healers and women folk through questionnaire and interviews. The knowledge of herbal preparation, parts used, mode of administration and local name was also taken during the study period. The present study has resulted in the documentation of 109 medicinal plant species belonging to 57 families and 102 genera used by the Gujjars for treatment of different skin ailments, viz. allergy, blisters, boils, chilblain, cracked feet, cuts, eczema, leprosy, leucoderma, ringworms, sore and wounds. The findings of present study shows documentation of 22 plant species which are found little known or less reported in available published literature. The Gujjar tribe lives interiorly in the forest localities and Government is making policies to rehabilitate them outside of forest areas, it is necessary to tap their rich heritable traditional knowledge on medicinal plants within time before it become vanished due to modernization. A comprehensive detailed search and report on the pattern of utilization of medicinal plants by this tribe has not evidenced in the earlier publications. Therefore, present attempt has been made to document traditional knowledge of Gujjar tribe used to treat different skin disorders by making various herbal preparations.

2954. **Sharma, N. & Joshi, S.P. 2008.** "Study on the medicinal plants of a fresh water swamp of Doon Valley". *J. Non-Timber Forest Prod.* 15(3): 173–182.

Abstract: This paper communicates a brief account of the medicinal plants of Mothronwala Fresh Water Swamp of Doon valley. The study revealed that about 112 species belonging to 100 genera and 48 families of angiosperms possess medicinal properties. Maximum numbers of species (11) belong to family Asteraceae whereas members of Fabaceae constitute another largest group having eight species. During the study it was noted that Mothronwala Fresh Water Swamp is the source of those medicinal species, which are more in demand in national and international drug market.

2955. **Sharma, P. & Sharma, N. 2006.** "Studies on medicinal value of some host species of stem parasite *Cuscuta reflexa* Roxb. of Doon valley". *Ann. Forest.* 14(2): 292–296.

Abstract: The present paper highlights several medicinal host plant species of *Cuscuta reflexa* Roxb. of the Doon valley. A total of 36 medicinal plants species was studied which are attacked by *Cuscuta reflexa* Roxb. and are damaged completely.

2956. **Sharma, R. & Chandra, V. 2015.** "Wild edible plants of Chopta mandal". *Ann. Forest.* 23(1): 90–112.

Abstract: The present diversity of wild edible plants of Chopta-mandal indicates a varied and diverse flora which has been used differently by different ethnic groups/ local people of the region. In all there are 64 species belonging to 47 genera and 36 families of angiosperms, gymnosperms and ferns in the study area. The genus *Rhododendron* is found to have 4 species, *Berberis, Rosa* and *Rubus* with 3 species and *Ficus, Prunus, Rumex* and *Urtica* with 2 species each, and the remaining genera with one species each. With respect to families, Rosaceae shared the largest proportion, i.e. consisted of 14 species, followed by Ericaceae with 4 species, Berberidaceae, Polygonaceae and Urticaceae having 3 species each respectively,

and Urticaceae, Moraceae, Dioscoreaceae and Caryophyllaceae 2 species each and the remaining families with 1 species each. Besides, the correct botanical name with original citation, important synonym, basionym where required, family, local name together with brief description, habitat and edible plants are appended under each species. This has been done to facilitate proper identification in the field and plants are arranged in alphabetical order.

2957. **Sharma, R.K., Dhyani, S.K. & Shankar, V. 1979.** "Some useful and medicinal plants of the district Dehra Dun and Siwalik". *J. Sci. Res. Pl. Med.* 1: 17–43.

2958. **Sharma, S. & Kumar, V. 2017.** "Ethnobotanical knowledge of *Gentiana kurroo* Royle found in Himalayan region of Uttarakhand". *J. Non-Timber Forest Prod.* 24(1): 29–32.

Abstract: The present paper deals with ethnomedicinal knowledge of *Gentiana kurroo* among people of Uttarakhand. The local people were interviewed on the basis of their traditional knowledge on the various uses of this plant found in the adjoining forest areas. New approaches of research, development and conservation strategy can help preserve and utilize the indigenous knowledge of medicinal plants for humankind.

2959. **Sharma, S.C. 1991.** "Traditional herbal medicines from Shahjahanpur district, U.P., India". *Vegetos* 4(1-2): 76–80.

2960. **Sharma, S.C. 1992.** "Preliminary survey of wild vegetable plants in the market of Shahjahanpur (U.P.)". *J. Econ. Taxon. Bot.* 16(3): 569–572.

Abstract: The paper presents enumeration of 15 wild plants exploited as vegetable. They belong to 14 families. The tubers, young twigs and leaves, green sepals, green fruits, seeds and young apical buds of wild plants are sold as vegetable in the markets of Shahjahanpur city. The vegetable sellers collect them from remote villages and sell them for their livelihood. The young twigs and leaves of *Amaranthus gracilis* Desf., *Chenopodium album* Linn., *Ipomoea reptans* (Linn.) Poir., *Portulaca oleracea* Linn. etc. are found to be nutritive and palatable.

2961. **Sharma, S.C. 1993.** "Traditional herbal medicines from Shahjahanpur district, U.P. II". *Vegetos* 6(1-2).

2962. **Sharma, S.C. 1996.** "A medicobotanical study in relation to veterinary medicines of Shahjahanpur district (Uttar Pradesh)". *J. Econ. Taxon. Bot.,* Addl. Ser. 12: 123–127.

Abstract: The paper deals with the 42 plant species utilised as veterinary medicines in the district. During medicobotanical study in remote villages of the district some interested as well as little known therapeutic information was collected. The folk populace was found well acquainted with the surrounding vegetation and to cure various ailments prevailing in the domestic animals.

2963. **Sharma, S.C. 2002.** Indigenous phytotherapy among rural women of Shahjahanpur district, Uttar Pradesh. In: Trivedi, P.C. (Ed.), *Ethnobotany.* Aavishkar Publishers and Distributors, Jaipur. Pp. 311–316.

2964. **Sharma, S.C. & Gautam, M. 1992.** "Medicobotanical studies on the trees of Badaun district, U.P.". *Vegetos* 5(1-2): 95–101.

2965. **Shukla, G., Mudgal, V. & Khanna, K.K. 1992.** "Notes on medicinal uses of plants known amongst rural folklore of Pratapgarh and Sultanpur districts, Uttar Pradesh". *J. Econ. Taxon. Bot.,* Addl. Ser. 10: 219–225.

Abstract: The paper deals with unreported medicinal uses of 43 plant species recorded from the rural folklore of Pratapgarh and Sultanpur districts of Uttar Pradesh. It has been observed that 6 plant species are used to antidote scorpion sting and snake bite, 5 plant species each for the treatment of fever, dysentery, diarrhoea, ttothache and pyorrhoea, while 2 plant species each for cough, cold, eye troubles, stomach trouble, headache, boils and jaundice. On the other hand, single plant species has been referred each for the treatment of htdrocele, body swelling, leucorrhoea, asthma, rheumatism, giddiness, earache, cholera, appetite and pneumonia.

2966. **Shukla, G., Verma, B.K. & Pandey, H.P. 2003.** "Folk-lore herbotherapy of Jalaun district U.P., India". *J. Econ. Taxon. Bot.* 27(1): 143–147.

Abstract: This contribution is an enumeration of 38 medicinal plants used in popular herbotherapy by the rural people of Jalaun district. The villagers of the district seek their nearby plant wealth for the treatment of their daily life maladies to chronic ailments viz., baldness, diarrhoea, impotency, jaundice, leucorrhoea, mumps, scorpion stings, snake btes and tuberculosis etc.

2967. **Siddiqui, M.B. & Husain, W. 1991.** "Medicinal ferns in the Hardoi district of central Uttar Pradesh". *Fitoterapia* 62(5): 451–452.

2968. **Siddiqui, M.B. & Husain, W. 1993.** "Traditional treatment of gonorrhoea through herbal drugs in the province of central Uttar Pradesh, India". *Fitoterapia* 64(5): 399–403.

2969. **Siddiqui, M.B., Alam, M.M. & Husain, W. 1989.** "Traditional treatment of skin diseases in Uttar Pradesh, India". *Econ. Bot.* 43: 480–486.

Abstract: The paper deals with some important medicinal plants used in human skin diseases in Uttar Pradesh, India. Fifty species of 47 genera belonging to 30 families of pteridophytes and angiosperms are reported along with dosage rate and mode of administration.

2970. **Sikarwar, R.L.S. 2007.** "Floristic diversity of Kamadgiri (the Chitrakoot hill)– A most ancient sacred grove of India". *Phytotaxonomy* 7: 66–77.

Abstract: The Kamadgiri (Chitrakoot hill) is most sacred and legendry hill of pilgrimage of Hindus. It is situated on the border of Satna district of Madhya Pradesh and Chitrakoot (Karwi) district of Uttar Pradesh. Extensive survey of Kamadgiri conducted during 2004-2007 yielded 210 species under 149 genera and 55 families. Out of these 2 species, 2 genera and 2 families belong to Pteridophytes and 208 species, 147 genera and 53 families to Angiosperms; among the Angiosperms, 171 species, 121 genera and 47 families belong to dicots and 37 species, 26 genera and 6 families to monocots.

2971. **Silori, C.S. & Badola, R. 2000.** "Medicinal plant cultivation and sustainable development: A case study in Buffer zone of Nanda Devi Biosphere Reserve, Western Himalaya, India". *Mount. Res. & Develop.* 20(3): 272–279.

Abstract: The Nanda Devi Biosphere Reserve (NDBR) in the western Himalaya has a high level of biological and cultural diversity. The Bhotiya community, whose livelihood is highly dependent on local natural resources, inhabits the buffer zone of NDBR. Bhotiya practice seasonal and altitudinal migration and stay inside the buffer zone of NDBR for only 6 months (May-October). A survey was conducted in 1996 in 5 villages in Pithoragarh District of the buffer zone, where Bhotiya cultivate medicinal plants on their agriculture fields. The aim of the survey was to understand the socioeconomics of medicinal plant cultivation and evaluate the future prospects of this practice in promoting sustainable development among the local community. Of a total of 71 families, 90% cultivated medicinal plants on 78% of the total reported cultivated area (15.29 ha). At the time of the survey, a total of 12 species of medicinal plants were under cultivation, of which 6 were being marketed while the remaining 6 were still under nursery plantation for future propagation. On average, a family earns about Rs. 2423 ± 376.95 per season from the sale of medicinal plants (Rs. 38 = US$1 in 1996). Based on the average productivity (kg/ha/y), we estimated that an average family could earn between Rs. 4362 and Rs. 86,500 from the sale of medicinal herbs. Encouragement of medicinal plant cultivation at high altitudes in the Himalayas would help to generate better monetary returns as well as conserve these herbs in the wild and preserve traditional ethnomedicinal knowledge among local people.

2972. **Singh, A. 2015a.** "Folk medicinal uses of the plant roots from Banaras Hindu University Main Campus, India". *Advanced Res. J. Pl. & Animal Sci.* 2(6): 49–52.

Abstract: The present study reports the folk medicinal uses of the roots of plants growing on the Banaras Hindu University main campus which spreads over 1,350 acres of land area. A total of 14 plant species of 14 genera belonging to 13 families were recorded on the university campus whose roots are therapeutically used against different ailments by rural population residing in villages nearby university campus. Fabaceae is the dominant family of the plants on the university campus (whose roots are used as folk medicines). Roots of herbaceous plants are medicinally more useful than the roots of shrubs and undershrubs.

2973. **Singh, A. 2015b.** "Medicinal Flora on the Banaras Hindu University Main campus, India". *Int. J. Bioinformatics & Biomed. Engineering* 1(3): 222–236.

Abstract: A study was undertaken to explore the medicinal flora of the Banaras Hindu University main campus, India, spreading over 1,350 acres of land area. A total of 415 medicinal plant species were recorded from the university campus, of which 404 plant species belonging to 308 genera and 96 families were represented by the Angiosperms, 6 plant species belonging to 5 genera and 3 families were represented by the Gymnosperms and 5 plant species belonging to 4 genera and 4 families were represented by the Pteridophytes. Fabaceae, Asteraceae and Malvaceae were the dominant families of the medicinal flora of the Banaras Hindu University main campus. The native medicinal plants dominated over the exotic medicinal plants and the medicinal plants of perennial duration dominted over the medicinal plants of annual and biennial durations on the university campus.

2974. **Singh, A. 2015c.** "Folk medicinal uses of the plant fruits from Benaras Hindu University main campus, India". *J. Life Sci. & Biotechnol.* 1: 10–16.

Abstract: The present study reports the folk medicinal uses of the fruits of plants growing on the Banaras Hindu University main campus (India) which spreads over 1,350 acres of land area. A total of 17 plant species belonging to 15 genera and 14 families were recorded on the university campus whose fruits are therapeutically used against different ailments. Myrtaceae, Rhamnaceae and Solanaceae were the dominant families of the plants on the university campus whose fruits are used as folk medicines. Fruits of the plants of tree habit are medicinally more useful than the fruits of the plants of herb and shrub habits.

2975. **Singh, A. & Dubey, N.K. 2012.** "An ethnobotanical study of medicinal plants in Sonebhadra district of Uttar, Pradesh, India with reference to their infection by foliar fungi". *J. Med. Pl. Res.* 6(14): 2727–2746.

Abstract: Sonebhadra district is one of the less studied regions of India for its ethnobotanical values. The present paper synthesizes the first report related to the documentation of ethnomedicinal plants of Sonebhadra district and their infection by foliar fungi. Ethnobotanical data were collected using semi-structured interviews and field observations. Correct identity of the plants was done with the help of relevant flora. Fungal organisms were identified on morphotaxonomic bases. The use of 143 medicinal plants belonging to 56 angiospermic families, by the tribal communities of Sonebhadra district has been documented. Out of 143 medicinal plants, 31 were found infected by different species of foliar fungi viz. *Pseudocercopsora, Alternaria, Cercospora, Passalora, Corynespora, Mycovellosiella, Veronia* and *Dreschslera*. Documentation of indigenous knowledge used for cure of different diseases by the tribes of the area can be used as basis for developing management plans for conservation and sustainable use of ethnomedicinal plants of the area. The report on foliar fungi infecting medicinal plants may draw attention of pharmaceutical firms and responsible sectors for proper care of the traditionally used medicinal wealth of the area.

2976. **Singh, A. & Singh, P.K. 2009.** "An ethnobotanical study of medicinal plants in Chandauli district of Uttar Pradesh, India". *J. Ethnopharmacol.* 121(2): 324–329.

Abstract: Chandauli district is one of the less studied regions of India for its ethnobotanical values. The present paper synthesizes the first report related to the documentation and conservation of ethnomedicinal plants of Chandauli district and their socio-economic relationship with the forests and its resources. Ethnobotanical data were collected using semi-structured interviews, field observations, preference and direct matrix ranking with traditional medicine practitioners. The use of 40 medicinal plants belonging to 27 families was documented in the tribal communities of Chandauli district in India. These species were used in combination of some exotic species such as *Foeniculum vulgare, Prosopis spicigera, Crataeva nurvala, Curcuma longa, Punica granatum, Aloe vera, Cocos nucifera, Ocimum sanctum* and *Allium cepa* and some medicinal stones, minerals, salts, etc. Most of the plants (94.6%) were reportedly used to treat human diseases.

2977. **Singh, A., Joshi, V. & Joshi, S.P. 2011.** "Some medico-magico-religious plants used by tribal folk of Jaunsar-Bawar, district Dehra Dun, Uttarakhand". *J. Non-Timber Forest Prod.* 18(3): 239–242.

Abstract: A study of the plants related to Magico-medico and religious beliefs in Jaunsar-Bawar reveals the indigenous magical, medicinal and religious uses of 16 plant species belonging to 16 genera and 14 families by the tribal people of Jaunsar-Bawar. Of these 4 species are trees, 5 species are shrubs and 7 species are herbs. Documentation of traditional knowledge on the magical, medicinal and religious uses of these plants is essential for conservation efforts for the plant resources.

2978. **Singh, A., Singh, G.S. & Singh, P.K. 2012.** "Medico-ethnobotanical inventory of Renukoot forest division of district Sonbhadra, Uttar Pradesh, India". *Indian J. Nat. Prod. & Resources* 3(3): 448–457.

Abstract: The present paper synthesizes first report related to medicinal plants used by the tribals communities mainly *koal, Panika, Dharkar, Kharvar and Gaund* of Renukoot forest division of district Sonbhadra, Uttar Pradesh. The methods used for ethnobotanical data collection were semi structured interview, field observation, preference ranking and direct-matrix ranking. It was observed that 105 medicinal plants used by the tribal communities belonging to 44 families are medicinally very significant. Results of the study were analysed using two quantitative tools: Informant Consensus Factor (ICF) and The Fidelity Level (FL). The data provided from our informnts and analysed in the present article clearly show that folk knowledge on medicinal plants and plant uses is still alive in the studied region thus documentation of this ethnomedicinal knowledge is important for the evaluation of pharmacological activity nd drug development.

2979. **Singh, A., Nautiyal, M.C., Kunwar, R.M. & Bussmann, R.W. 2017.** "Ethnomedicinal plants used by the local inhabitants of Jakholi block, Rudraprayag district, Western Himalaya, India". *J. Ethnobiol. & Ethnomed.* 13: 49–77.

Abstract: The present study is the first ethnomedicinal study in Jakholi area of Rudraprayag district of Northwestern India. The aim of present study was to identify traditional medicinal plants used by the inhabitants to treat different ailments and document the associated knowledge of these medicinal plants. An ethnomedicinal survey was carried out in 72 of 133 villages and alpine pastures of Jakholi block (800–4000 m asl). Door to door surveys and group discussions, applying semi-structured questionnaires were conducted with traditional healers and villagers in local language (Garhwali). Informant Consensus Factor (ICF) was computed to analyse collected ethnomedicinal data. A total of 78 species (Gymnosperms 3 species, Monocotyledons 12 and 63 Dicotyledons) belonging to 73 genera in 46 families were identified to treat 14 different ailments categories. Most dominant family is Asteraceae (5 species). In disease treated categories, Diseases of the skin (DE) have the highest proportion (29.55%) followed by Gastro-intestinal disorder (GA) (25.89%). The most life form of plants used was herb (56%) followed by tree (23%) while root was the most frequently used part of the plants and the traditional preparation was mainly applied in the form of paste (37%). The highest ICF value (0.99) was found for

hair ailments (HA) followed ophthalmologic complaints (OP) and mental afflictions (MA) (0.98).

2980. **Singh, A., Singh, R.K., Singh, P. & Singh, A. 2015.** "Mango biodiversity in eastern Uttar Pradesh, India: Indigenous knowledge and traditional products". *Indian J. Tradit. Knowl.* 14(2): 258–264.

Abstract: The patterns of nomenclature, conservation and traditional uses of mango (*Mangifera indica* L.) trees and fruits were studied in four districts of eastern Uttar Pradesh (Jaunpur, Azamgarh, Sultanpur and Faizabad), which have preponderance of mango groves consisting of landraces. An explanatory (qualitative) research design, supported by participatory research tools, was adopted to collect the data. The study specifically focused on the role of Indigenous knowledge in the sustainable management of mango groves, which have played a crucial role in livelihood adaptations in the past. It emerged from the data that present day mango groves were planted by the forefathers of present generations who believed in the philosophy of "aadhi kheti, aadhi baari" which literally means 'half the crop lands and half the gardens'. This philosophy, based on premise that half the area of a village ecosystems should be cultivated to produce food grains while another half should be under tree plantations to ensure provisioning of fruits, fuel wood, timber and environmental services, was driven by an integrated and sustainable farming approach based on local resources and traditional knowledge.

2981. **Singh, A., Hart, R., Chandra, S., Nautiyal, M.C. & Sayok, A.K. 2019.** "Traditional herbal knowledge among the inhabitants: A case study in Urgam valley of Chamoli Garhwal, Uttarakhand, India". *Evidence-Based Complementary & Alternative Med.* 2019: Article ID 5656925 (21 pages).

Abstract: The Indian Himalaya is rich in plant species, including many medicinal plants, greatly valued by local inhabitants for health care needs. The study in Urgam Valley of Uttarakhand, India, is to identity and document traditional knowledge of medicinal plants. The study revealed high consensus on medicinal plant usage, with 51 species belonging to 31 families used for local health care. Number of species and uses known increases with age, and elders and specialist healers retain higher levels of traditional medicinal plant knowledge, having unique knowledge of medicinal plants and their uses as well as preparation.

2982. **Singh, A.K. 1999**. "A contribution to the ethnobotany of sub-Himalayan region of eastern Uttar pradesh". *J. Econ. Taxon. Bot.* 23(1): 237–246.

Abstract: The present paper describes some important aspects of ethnobotany of the tribe- Tharu of sub-Himalayan region of eastern Uttar Pradesh. Tharus are mainly concentrated along the Indo-Nepal border. An ethnobotanical survey was conducted in the villages of Tharus of the study area, during 1993-1997, and 118 plant species belonging to 103 genera and 57 families were found of ethnobotanical interest. The plant species are enumerated in alphabetical order along with families and local names, followed by their ethnobotanical uses.

2983. **Singh, A.K. 2000.** A contribution to the ethnobotany of sub-Himalayan region of Eastern Uttar Pradesh. In: J.K. Maheshwari (Ed.), *Ethnobotany and medicinal plnts of India sub-continent*. Pp. 237–246. Scientific Publishers, Jodhpur.

2984. **Singh, A.K., Raghubanshi, A.S. & Singh, J.S. 2002.** "Medical ethnobotany of the tribals of Sonaghati of Sonbhadra district, Uttar Pradesh, India". *J. Ethnopharmacol.* 81(1): 31–41.

Abstract: The present ethnobotanical exploration study presents the folk medicinal uses of certain plants by tribes of the Sonbhadra district in the Uttar Pradesh state of India. One hundred and twenty five plants from 57 families, which are therapeutically used against different diseases, such as cough, cold, dysentery, diarrhoea, ulcers, diabetes, male and female weakness, snake-bite and skin disorders are covered in this report. Part of the plant used, dosage and the mode of drug administration in different ailments are described.

2985. **Singh, A.K., Singh, Priyanka & Srivastava, Smrita. 2009.** "Medicinal weeds of Varanasi district (Uttar Pradesh)". *J. Econ. Taxon. Bot.* 28(2): 263–273.

Abstract: The present communication deals with the medicinal weeds of Varanasi district. In all 89 species belonging to 75 genera and 43 families are enumerated along with their family, brief description and medicinal uses.

2986. **Singh, A.K., Singh, R.N. & Singh, S.K. 1987.** "Some ethnobotanical plants of Terai region of Gorakhpur district–I". *J. Econ. Taxon. Bot.* 9(2): 407–410.

Abstract: The present paper deals with some ethnomedicinal plants used by the tribals of Terai region of Gorakhpur district, U.P. The area under study is chiefly inhabited the scheduled tribe, the Tharus. They are found in the northern ortion of the district, mainly the Maharajganj and Pharenda tehsils. They are using a large number of plants as medicine in a variety of ways for various ailments. 34 interesting medicinal plants species belonging to 31 genera and 23 families have been enumerated and are arranged in alphabetical order. Local names and families are given in brackets against each species. This is followed by usese and method of application against various diseases and ailments.

2987. **Singh, A.P. & Johari, D. 2015.** "Ethnobotany and social context of pteridophytes used by Tharu tribes in Terai regions of Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 39(3-4): 512–526.

Abstract: Tharu tribe are an ethnic group indigenous to the Terai region of Uttar Pradesh and the soujthern foothills of Himalayas. Terai represents one of the richest vegetational zones of U.P. Study on ethnobotany and social context of pteridophytes were conducted to document their folk utilization. Data were assembled from frequent survey conducted in 25 forest ranges. A total of 26 species belonging to 16 genera and 14 families were identified. Survey of pteridophytes and interviews conducted with the Tharu communities revealed that 14 species of medicinal plants are utilised in the treatment of 68 diseases. Literature survey showed no documentation of ethnobotanical studies on pteridophytes of this region. Therefore, the paper documents botanical name, regional name, uses for treatment of various diseases,

utilization, occurrence, voucher specimens, part of plants used and mode of use, to fill the gap of our knowledge on ethnobotany of Tharu tribes.

2988. **Singh, A.P., Kumar, M., Nagar, B., Pala, N.A. & Bussmann, R.W. 2019.** "Ethnomedicinal use of plant resources in Kirtinagar Block of Tehri Garhwal in Western Himalaya". *Ethnobot. Res. & Applications* 18(14): 1–11.

Abstract: The aim of the present study is to report the cultural importance and utilization of ethnomedicinal plant species among the communities of Tehri district in Garhwal Himalaya, India. The ethnomedicinal uses of plants were collected from participants of the villages based on randomly selected inhabitants through semi structured interviews. A total of 93 respondents provided information. The documentation recorded a total of 92 ethnobotanical plant species including trees (52), shrubs (19), herbs (18) and climbers (3). Out of 92 species, only 35 species were used for ethnomedicinal purposes to cure 30 different ailments prevailing in the area. The maximum number of species (9) was used for stomach disorders followed by diabetes and wounds (4 each), and fractures and tooth problems (3 each). The informant consensus factor (Fic) for joint pain was 0.0 whereas Fic value for other species ranged from 0.600 to 1.0. The fidelity level (FL) was highest (100%) for 14 species and the lowest value of FL (20%) was recorded for *Eupatorium adenophorum*. The Cultural Importance Index (CI) was highest for *Barleria cristata* (0.15) and lowest (0.01) for *Azadirachta indica* and *Boehmeria rugulosa* each.

2989. **Singh, G. & Rawat, G.S. 2011a.** "Ethnobotanical survey of Kedarnath Wildlife Sanctuary in Western Himalaya, India". *Indian J. Fundamental & Appl. Life Sci.* 1(1): 35–46.

Abstract: The importance of medicinal plants in traditional healthcare practices, providing clues to new areas of research and in biodiversity conservation is now well recognized. However, information on the uses for plants for medicine is lacking from many interior areas of Himalaya viz., Kedarnath Wildlife Sanctuary. The local inhabitants in the outer fringes of Kedarnath WS, Western Himalaya have inherited a rich traditional knowledge on the use of wild plants. Questionnaire surveys, participatory observations and field visits were planned to illicit information on the uses of various plants. Local people either use or had information on uses of 126 species belonging to 104 genera and 51 families. It was found that more than 30 plant species are commonly used by local people for curing various diseases. In most of the cases underground parts (38%) of the plants were used. Most of the plant species are used for common diseases, i.e., skin diseases, dysentery, cough, fever, wounds and rheumatism.

2990. **Singh, G., Rawat, M.S., Pandey, D. & Rawat, G.S. 2011.** "Status and traditional uses of medicinal plants in Mandal area of Western Himalaya, India". *Med. Pl. Int. J. Phytomed. & Related Industries* 3(2): 95–104.

Abstract: The medicinal plants in traditional healthcare practices are providing clues to new areas of research and are well recognized in biodiversity conservation. Traditional knowledge has been the driving force for many basic scientific developments. However, the information on the uses of various plants for medicine is lacking from many interior areas of western Himalaya. Keeping this in view, a survey was conducted to explore the diversity of medicinal plants, their status in the wild and uses by the local communities for curing various ailments, situated in the fringes of Kedarnath Wildlife Sanctuary, Uttarakhand. Study revealed that more than 46 plant species out of 137 species of medicinal values recorded from the region are commonly used by the local people for their traditional health care system viz., skin diseases, dysentery, cough, fever, wounds, female disorders, joint pain, gastric problems, nasal bleeding, cold, piles, anti poison, ear problems, eye problems, stones and rheumatism.

2991. **Singh, G., Verma, D., Pande, D. & Rawat, G.S. 2011.** "Phytoresource diversity and their traditional uses by mountain villages in Kedarnath Wildlife Sanctuary, Western Himalaya, India". *J. Econ. Taxon. Bot.* 35(2): 301–313.

Abstract: A surey was conducted to explore the resource diversity and their uses by the local communities situated in the fringes of Kedarnath Wildlife Sanctuary, Uttarakhand. Consumption pattern and impact of the fores resources were also taken into consideration. For this study randomly 12 villages were selected and from each village, 20 people were interviewed randomly. Only one person was interviewed from a household. A total of 240 respondents were interviewed. Study revealed that 316 species belonging to 79 families and 212 genera are utilised by the local people for various purposes. Species are used as fodder (145), medicinal (126), fuelwood (89), edible (27), consruction (21), fibre (5), oil seeds (4) and other miscellaneous (61) uses by the local communities. Some lant species have multiple uses.

2992. **Singh, H. 1986.** *Some Medicinal Plants in Joshimath Block, District Chamoli-Garhwal.* Ph. D. Thesis, H.N.B. Garhwal University, Srinagar. (unpublished)

2993. **Singh, H. 1988.** "Ethnobiological treatment of piles by Bhoxas of Uttar Pradesh". *Ancient Sci. Life* 8(2): 167–170.

Abstract: The paper deals with some less known ethnomedicinal plants as well as animals which are use in the treatment of piles by the Bhoxa tribe of Uttar Pradesh.

2994. **Singh, H. 1989.** "Ethnobotanical studies on *Urtica dioica* Linn. among the Bhotias of Chamoli-Garhwal, U.P.". J. *Econ. Taxon. Bot.* 13(3): 719–724.

Abstract: The present paper deals with the study on ethnobotanical importance of *Urtica dioica* Linn. among the Bhotia tribe and aboriginals inhabiting in Joshimath block of Chamoli Garhwal. It plays an important role in the life of the inhabitants and became an inseparable part of their life. They utilize almost all parts of this plant for various purposes (eg. Food, fodder, fibre, fuel, medicine, dye, etc.) in their daily life. It is also used in various magico-religious beliefs etc. Some unique totemic informations regarding this plant are being reported here for the first time which is obscure yet in other parts of the country.

2995. **Singh, H. 1992.** *Ethnobotanical Sudies of the Bhoxa Tribe of Nainital District.* Ph. D. Thesis, H.N.B. Garhwal University, Srinagar. (unpublished).

2996. **Singh, H. 1993.** Traditional conservation of forest flora by the Bhoxas of Nainital district, Uttar Pradesh. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies.*

G.B. Pant Institute of Himalayan Environment & Development, Almora by Gyanodaya Prakashan, Nainital. Pp. 401–406.

2997. **Singh, H. 2003.** "Herbal recipes for spermatorrhoea by Bhoxa ribe of Uttaranchal". *Ethnobotany* 15: 115–117.

Abstract: During ethnobotanical studies on Bhoxa tribe of Udhan Singh Nagar district in Uttaranchal state, nearly 230 species were identified as drug plants. Of these, 20 unrecorded herbal recipes for spermatorrhoea are discussed in this paper.

2998. **Singh, H. 2005.** Plants used as ethnomedicine by the Bhoxas of Uttaranchal. In: Prabhuji S.K., Rao, G.P. & Patil, S.K. (Eds.), *Recent Advances in Medicinal Plants Research.* Satish Serial Publishing House, New Delhi. Pp. 251–261.

2999. **Singh, H. 2006a.** "Some unrecorded dye-yielding medicinal plants and their less-known ethnomedicinal uses in Uttaranchal". *Ethnobotany* 18: 119–121.

Abstract: The present paper deals with five unrecorded dye-yielding plant species and their less-known ethnomedicinal uses, which are being practised by the Bhoxa tribe in Uttaranchal.

3000. **Singh, H. 2006b.** Medicinal plants and their local uses in Sub-Himalayan tract of Uttaranchal. In: Trivedi, P.C. (Ed.), *Medicinal Plants: Ethnobotanical Approach.* Agrobios, Jodhpur. Pp. 201–206.

3001. **Singh, H. & Bisht, G.S. 1988.** "Depletion of ethnomedicinal plants in alpine region of Chamoli Garhwal along with concept of their conservation and multiplication". *J. Sci. Res. Pl. Med.* 9(1-2): 20–23.

Abstract: In the present communication authors are evaluating the list of depleting ethnomedicinal plants of the alpine region of Chamoli district. Their season and concept to check it by conservation and multiplication either by tissue culture method or field cultivation are also suggested, which would be beneficial to local people and also to the outsiders.

3002. **Singh, H. & Bisht, G.S. 1993a.** "Some novel folk treatments among the tribes of Uttar Pradesh". *Ancient* Sci. *Life* 18(3-4): 250–253.

Abstract: The paper constitute report on some interesting plant - based fait and belief, and novel treatments practiced by Boxas of Nainital, Bijnor and deharadun districts, tharus of gonad and saharia tribe of Lalitpur districts of U.P. 23 plant species have been reported to be used against various ailments of mankind, in scorpion sting and snake bite, root juice of *Musa paradisica* is used as contraceptive, while seed paste of *Abrus precatorius* in abortion. Moreover, Boxas of Nainital believe that if a root piece of *Achyranthes aspera* is worn over the neck of a lad unable to conceive will certainly conceive. Similarly, tharus of baharaich and gonda scattered leaves of *Putranjiva roxburghii* over the maternity room for an easy delivery.

3003. **Singh, H. & Bisht, G.S. 1993b.** "Traditional therapy among the Tolchhas of Chamoli Garhwal, U.P.". *J. Sci. Res. Pl. Med.* 13: 5–7.

3004. **Singh, H. & Husain, T. 2012.** "Sacred groves of Kumaun Himalaya, India: An abode for lichens". *Phytotaxonomy* 12: 145–150.

Abstract: Sacred groves are well recognised in the world in terms of biodiversity conservation. The Kumaon Himalayan region comprises many sacred groves having immense biodiversity with strong religious and traditional beliefs. This study highlights the luxuriant growth and diversity of lichens in the sacred groves of Pithoragarh district, Kumaon Himalaya. The Himalayan grove provides suitable microclimatic conditions for the successful growth and development of lichens along with other floristic elements of the region. For the study, two sacred groves present at different altitudinal gradients were selected and surveyed for recording the diversity of lichens. A total of 66 species belonging to 30 genera and 17 families were recorded from both the sacred groves. In Thalkedar sacred grove, lichen diversity was found maximum with 51 species belonging to 23 genera and 15 families in which 23 are foliose, 20 crustose, 7 fruticose and 1 squamulose, while in Haat Kali sacred grove a total of 29 species belonging to 18 genera and 11 families were recorded, out of which 20 are foliose, 4 crustose, 3 fruticose, 1 squamulose and 1 leprose. The abundance of foliose lichens in both the groves represents pollution-free environment of the groves. In the wake of increasing anthropogenic pressure, these groves are facing great threat, which is causing large scale degradation of these fragile ecosystems. Hence, it is the need of time to take appropriate steps for the conservation of the sacred groves.

3005. **Singh, H. & Maheshwari, J.K. 1992.** "Traditional remedies for snakebite and scorpion-sting among the Bhoxas of Nainital district, U.P.". *Aryavaidyan* 6(2): 120–123.

Abstract: The present paper deals with 15 important medicinal plants used for the treatment of snake-bite and scorpion-sting by the Bhoxa tribes. These uses reported for the first time, are not well known and it will be extremely useful if phytochemists and pharmacologists can determine the true structure of therapeutically useful compounds.

3006. **Singh, H. & Maheshwari, J.K. 1993.** "Phytotherapy for Diphtheria by the Bhoxas of Nainital district, Uttar Pradesh, India". *Ethnobotany* 5: 63–65.

Abstract: Ethnobotanical studies on the Bhoxa tribe of Nainital district, Uttar Pradesh, carried out during the year 1986-1991, reveal that the Bhoxas employ nine herbal remedies for the treatment of diphtheria for both human beings and cattle.

3007. **Singh, H., Husain, T. & Agnihotri, P. 2010.** "Haat Kali Sacred Grove, Central Himalaya, Uttarakhand". *Curr. Sci.* 98(3): 290.

Abstract: Ninety four species of both flowering and non-flowering plants has been reported from Haat Kali sacred groves of which 42 species were angiosperms and 4 pteridophytes, 15 bryophytes and 35 were lichens.

3008. **Singh, H., Saklani, A. & Lal, B. 1990.** "Ethnobotanical observations on some Gymnosperms of Garhwal Himalaya, Uttar Pradesh, India". *Econ. Bot.* 44(3): 349–354.

Abstract: This paper describes the ethnobotanical importance of nine gymnosperms common in temperate regions of Garhwal Himalaya, India. Folklore claims of these plants were obtained during field studies. For each plant its popular name, local name, and manner of use are described.

3009. **Singh, H., Agnihotri, P., Pande, P.C. & Husain, T. 2011.** "Biodiversity conservation through traditional beliefs system in Indian Himalaya: A case study from Nakuleshwar Sacred Grove". *Environmentalist* 31(3): 246–253.

Abstract: Sacred groves are well recognized in the world in terms of biodiversity conservation. The present study was conducted in the Nakuleshwar sacred grove, in the valley of Thal Kedar hill in the Kumaon region of Pithoragarh district in Indian Himalaya, in appreciation of its role in biodiversity conservation. The study aimed at the documentation and inventory of the sacred grove, its phytodiversity, threats and conservation in the Himalayan region, and to achieve this, systematic field surveys were conducted during 2007–2010 covering all four seasons. A total of 83 species from 71 genera and 50 families were identified, of which 43 species are flowering plants, including 7 trees, 7 shrubs, 4 climbers and 25 herbs, and 40 species are non-flowering plants of which lichens are represented by 12 species from 8 genera, bryophytes 6 species from 5 genera, and pteridophytes 7 species from 9 genera, while gymnosperms are represented by a single species. *Acer oblongum*, *Cinnamomum tamala*, *Cedrus deodara*, *Coriaria nepalensis* act as keystone species in the grove. *Ophiopogon inermis* is a common herb during the rainy season while *Goodyera hemsleyana* (Orchid) is a new distribution record for the western Himalaya. A total of 43 species from 38 genera are used ethnobotanically by local people for various ailments. *Mahonia nepaulensis*, *Asparagus adscendens*, *Thalictrum foliolosum*, *Cinnamomum tamala* and *Berberis asiatica* are highly exploited species and need to be conserved. Climatic conditions of the grove are moderate and the floristic patch of the grove is completely different from the plant diversity of the surrounding area and matches with the diversified floral wealth of comparatively higher altitudes. Due to anthropogenic pressure, this grove is facing new threats of degradation, hence needing special attention.

3010. **Singh, H., Agnihotri, P., Pande, P.C. & Husain, T. (2012) 2013a.** "Ethnoboatnical diversity in Patal Bhuvneshwar sacred grove of Kumaon Himalaya (Uttarakahnd)". *Ethnobotany* 24: 75–78.

Abstract: The present study deals with a survey of ethnobotanical plants in the Patal Bhuvneshwar sacred grove of Pithoragarh district, Uttarakhand. About 25 ethnobotanical plants have been found, which belong to 24 genera under 17 families. Parmeliaceae of lichens is the dominant family followed by Apiaceae and asteraceae. *Valeriana jatamansi* is a vulnerable species. There is need to conserve these important sacred patches by taking appropriate measures.

3011. **Singh, H., Agnihotri, P., Pande, P.C. & Husain, T. 2013b.** "Role of traditional knowledge in conserving biodiversity: A case study from Patalbhuvneshwar sacred grove, Kumaon Himalaya, India". *J Biodiv. Manage. & Forest.* 2.2. doi no.IOAI72/ 2327-4417.1000108.

Abstract: The paper deals with the inventory of sacred groves and its phytodiversity from Kumaon Himalaya. These groves are well recognized in the world in terms of biodiversity conservation. Kumaon Himalayan region comprises many sacred groves, different ethnic cultures, traditional way of conserving biota. Realizing the importance,

the study was conducted in Patal Bhuvneshwar sacred grove conserved by Rawal, Bhandari and Guro local communities. This grove provide excellent micro-climatic habitat for the luxuriant growth of flowering and non-flowering taxa and covered by dense forest of Cedrus deodara. Total 65 species under 61 genera and 47 families of both flowering and non-flowering plants were recorded. In which, lichens are represented by 13 species, bryophytes (8 species), pteridophyte (7 species) and gymnosperm (1 species). 43 species belonging to 38 genera and 28 families are ethnobotanically used by local communities for various purposes. Although the grove is conserved on religious beliefs, but facing several threats such as anthropogenic pressure and socio-economic pressure.

3012. **Singh, H., Gupta, L.K., Shah, S.C. & Bisht, G.S. 1995.** "Observations on wild edible plants growing around the Government Garden, Chaubattia (Ranikhet), district Almora, Uttar Pradesh". *J. Econ. Taxon. Bot.* 19(2): 325–330.

Abstract: The present paper deals with 55 wild edible plants growing around the Government Garden, Chaubattia (Ranikhet). The plant species are arranged in alphabetical order according to their botanical name followed by their respective family, local name, edible parts and method of utilization.

3013. **Singh, H., Gahlan, P., Dutt, S., Ahuja, P.S. & Kumar, S. 2011.** "Why uproot *Picrorhiza kurrooa,* an endangered medicinal herb?" *Curr. Sci.* 100(7): 1055–1059.

3014. **Singh, H., Husain, T., Agnihotri, P., Pande, P.C. & Iqbal, M. 2012.** "Biodiversity conservation through traditional belief system: A case study from Kumaun Himalaya". *Int. J. Conserv. Sci.* 3(1): 33–40.

Abstract: The present study was carried out in Malay Nath sacred grove of Kumaon Himalaya, India, in appreciation of its role in biodiversity conservation. The whole grove is dedicated to the local deity "Malay Nath", and showing semi-temperate type vegetation of the region. Rituals and cultural beliefs of the local peoples of Kumaon are plays significant role in conserving biodiversity. The study aimed at the documentation and inventory of the sacred grove, its phytodiversity, threats and conservation in the Indian Himalayan of Kumaon region, and to this, systematic field surveys were conducted during 2007-2010 covering all four seasons viz., summer, rainy, winter and spring. A total of 64 species in 58 genera under 47 families were identified, of which 35 species are flowering plants and 29 species are non-flowering plants. The dominant family was Parmeliaceae of lichen which recorded the maximum 6 species. 35 plant species under 32 genera and 23 families are used as an ethno-medicinal and the information about the ethno-medicinal plants was gathered from knowledgeable elderly local peoples of the area. *Hedychium spicatum, Bergenia ciliata, Origanum vulgare, Berberis asiatica*, etc. are highly exploited species and need to be conserved.

3015. **Singh, H., Husain, T., Agnihotri, P., Pande, P.C. & Khatoon, S. 2014.** "An ethnobotanical study of medicinal plants used in sacred groves of Kumaon Himalaya, Uttarakhand, India". *J. Ethnopharmacol.* 154(1): 98–108.

Abstract: International organizations recognize the importance of sacred groves and place them into the context of sustainable development and also emphasize to

conserve biodiversity through protection of sacred groves and sties. The significance of medicinal plants from Himalayan region is well known to the world. Therefore, present study was conducted in identified sacred groves of Kumaon Himalaya to investigate and document the utilization of medicinal plants by various local communities and tribal people. Seven sacred groves viz., Dhwaj, Haat Kali, Hokra, Malay Nath, Nakuleshwar, Narayan Swami Ashram and Patal Bhuvneshwar were identified from the Pithoragarh district of Kumaon Himalaya. 89 medicinal plants belonging to 52 families and 77 genera of which, 2 are lichens, 4 are pteridophytes, 3 are gymnosperms and remaining 80 plant species are angiosperms. 6 plant species are reported with new therapeutic uses for the first time in this paper. Highest informant×s consensus factor value was found in liver disorder (0.55) and least by body pains (0.23). 55 ethnomedicinal plants are showing 100% fidelity level against various diseases.

3016. **Singh, J. 2012.** "Ethnobotanical regulation of epilepsy by the tribals of Sonbhadra district, Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 36(1): 69–72.

Abstract: Epilepsy affects 50 million people worldwide. It affects an estimated 7 million people in India. The present investigation reveals the ethnomedicinal informations collected from the tribals of Sonbhadra district, Uttar Pradesh which are claimed to regulate epilepsy. Some of the important medicinal plants which are used to regulate epilepsy are *Argemone Mexicana* L., *Tinospora cordifolia* (Wiild.) Miers ex Hook.f. & Thoms., *Gardenia turgida* Roxb., *Meliosma simplicifolia* (Roxb.) Walp. etc. About 14 plant species are presented in this paper.

3017. **Singh, J. & Narain, S. 2007a.** "*Evolvulus alsinoides* and *Ficus racemosa*: A traditional remedy for urinary complaints in females by Baigas of Sonbhadra district Uttar Pradesh, India". *Fl. & Fauna* 13(1): 67–68.

3018. **Singh, J. & Narain, S. 2007b.** "The Ethnobotanical account of Sonbhadra district (U.P.)- A review". *J. Phytol. Res.* 20(2): 255–264.

Abstract: The present account deals with the total 171 angiospermic species belonging to 150 genera of 60 families, which have immediate and effective solution for making comfortable future for human population against diseases like gastrointestinal problems, fever, epilepsy, leucorrhoea, male and female contraceptives, body pain, wound, cough and cold, snake and scorpion bite, jaundice, diabetes etc. The dicotyledons are represented by 153 species of 130 genera and 51 families, while monocotyledons are represented by 18 species of 15 genera and 9 families. The percentage of Dicotyledons: Monocotyledons is 89.4:10.6. It is vital and essential to integrate activities involving both biodiversity and cultural conservation into such works. Research needs to be enhanced to identify plants with medicinal value and to isolate compounds of medicinal importance.

3019. **Singh, J. & Narain, S. 2010.** "Tribal prescriptions for skin ailments on Sonaghati, Uttar Pradesh, India". *J. Econ. Taxon. Bot.* 34(2): 349–352.

Abstract: The paper provides information on the use of plant crude drugs for skin ailments prevalent in the tribals of Sonaghati, Sonbhadra district, Uttar Pradesh. The present paper deals with 24 plant species belonging 22 genera of the 14 families

used for skin ailments by the tribes of Sonaghati region. For each species, the information regarding botanical names, local names, parts used and ethnomedicinal uses have been provided.

3020. **Singh, K.K. 1996.** Ethnobotanical observations on of Southern U.P., India: Utilization and Conservation. Jain, S.K. (Ed.) Proc. IV Int. Cong. Ethnobiology, Lucknow: Ethnobiology in human welfare. Deep Publications, New Delhi. Pp. 145–148.

3021. **Singh, K.K. 1997.** "Studies on native medicine of Jaunsari tribe of Dehradun district, Uttar Pradesh, India". *Int. J. Pharmacogn.* 35(2): 105–110.

Abstract: This paper reports 58 ethnomedicinal plants used by the Jaunsari tribe of the Dehradun district, Uttar Pradesh, India in the preparation of native medicines for the treatment of ailments. The Jaunsar-Bawar area of the district, inhabited by the Jaunsari tribe was surveyed during 1989–1992 to gather information on the traditional uses of medicinal plants and to uncover new uses of known plants, used in health care by them. The study provides first-hand information on local name, locality, preparation of ethnomedicines, dosage and mode of administration. The district is rich in raw materials for establishing herbal drug industries.

3022. **Singh, K.K. & Kumar, K. 1999.** "Ethnotherapeutics of some medicinal plants used as antipyretic agents among the tribal of India". *J. Econ. Taxon. Bot.* 23(1): 135–141.

Abstract: The term 'Ethnotherapeutics' refers to the beliefs, claims, herbal medicine preparations and practices in alleviating disease and disorders among the tribals and aboriginal populations. During our ethnobotanical surveys and studies among the tribals and indigenous communities namely Tharu, Kol, Gond, Kharwar, Korwa of Uttar Pradesh and Santhal, Paharia, Oraon, Munda of Bihar, some valuable and less known information were gathered about the ethnomediocinal plants used as antipyretic agents. The indigenous preparations are widely taken in fever, malarial fever and kala-azar. Some of the less known and effective species recorded for this purposes are namely *Andrographis paniculata, Bacopa monnieri, Boerhavia diffusa, Caesalpinia bonduc, Cissampelos pareira, Cyperus scariosus, Hemidesmus indicus, Limnophila gratioloides, Luffa graveolens, Marsdenia tanacissima, Moringa oleifera, Nyctanthes arbor-tristis, Vitex negundo, V. peduncularis, Ziziphus nummularia*, etc. The ethnomedicinal recipes, mode of administration, dosage along with chemical constituents and biological activities of some potential plants are provided in this paper, which would be useful for development of some effective herbal medicine for human welfare.

3023. **Singh, K.K. & Maheshwari, J.K. 1983.** "Traditional phytotherapy amongst the tribals of Varanasi district, U.P.". *J. Econ. Taxon. Bot.* 4(3): 829–838.

Abstract: An ethnobotanical survey was carried out amongst the Kol, Kharwar, Chero and Mushar tribals of Varanasi, Uttar radish. The tribal populations inhabiting the forest areas have learnt to utilize local plants in various ailments by the method of trial and error. The present paper deals with the therapeutic uses of fiftythree medicinal plants in various ailments. The first hand information on the local names, mode of uses, doses etc. have been gathered from the tribal medicinemen 'Baiga' as well as other old and experienced tribals. Some of the important medicinal plants used in the treatment of diseases are represented by species like *Aristolochia indica* L., *Boswellia serrate* Roxb. ex Coleb., *Cassia tora* L., *Celastrus paniculatus* Willd., *Crinum defixum* Ker-Gawl., *Elephantopus scaber* L., *Gloriosa superba* L., *Nyctanthes arbortristis* L., *Selaginella bryopteris* (L.) Bak. Etc. The species are enumerated alphabetically along with their family and local names, locality, uses and voucher specimens. The survey has brought to light some interesting data on medicinal plants which can be utilized for ascertaining thir true therapeutic properties and establishing herbal production centres in the region as well as providing employement to the tribal populations of the district.

3024. **Singh, K.K. & Maheshwari, J.K. 1985.** "Observation on some wild plant foods of the tribals of Varanasi district, Uttar Pradesh". *Vanyajati* 33(2): 25–31.

3025. **Singh, K.K. & Maheshwari, J.K. 1989.** "Traditional herbal remedies among the Tharus of Bahraich district, U.P., India". *Ethnobotany* 1: 51–56.

Abstract: The Tharu tribe of Bahraich district, belonging to Rajvansi and Kathuriya sect, inhabits the Himalayan foothills of India. They utlize many medicinal plants from their surrounding flora in the treatment of diseases. First-hand information on local names, frequency, ethnomedicinal recipes, dosage and mode of administration has been gathered from Tharu medicinemen and other old and experienced informants. The present study deals with 40 plants used by Tharu tribe.

3026. **Singh, K.K. & Maheshwari, J.K. 1990.** "Plant wealth in the life and economy of the Tharus of Nainital district, Uttar Pradesh". *Indian Forester* 116(8): 636–642.

Abstract: The forest areas of Nainital district inhabited by the Tharus were explored to study the plant wealth potential of the area. The economic plant wealth plays a vital and significant role in the economy and health care system of the tribals. An inventory of two hundred plants and plant produce used by the Tharus for food, fibre, medicine, oils, handicrafts, fuels, etc. has been prepared. There are enormous potential to develop the plant-based cottage industries in the tribal tarcts of the district such as herbal drug industry, edible plant processing and preservation units, tannins, gum and resin collection, handicrafts and cordage, brooms, mats and basket industry, oil seeds collection and extraction units etc. for the uplift of the tribal and rural population of the district.

3027. **Singh, K.K. & Maheshwari, J.K. 1992.** "Folk medicinal uses of some plants amongst the Tharus of Gorakhpur district, Uttar Pradesh". *Ethnobotany* 4(1&2): 39–43.

Abstract: The Tharu tribe inhabits the Himalayan foothills of India from Nainital to Darjeeling. The present study deals with new or less known medicinal uses of 30 plants among the Tharus of Gorakhpur district, U.P. The information on local names, ethnomedicinal preparation, dosage, mode of administration, locality and frequency of the species has been recorded after careful examination. A few examples are uses of plants like *Bacopa minnieri* and *Nyctanthes arbor-tristis* in malarial fever, *Sida cordata* in dysentery, *Sida rhombifolia* in diabetes, *Calotropis procera* in piles, *C. gigantea* and *Launaea acaulis* in jaundice, *Oxais corniculata* in eye disease, *Typhonium trilobatum* in earache, *Leea macrophylla* in bone facture and *Chrozophora rottleri* in leucoderma by the Tharus in their health care.

3028. **Singh, K.K. & Maheshwari, J.K. 1994.** "Traditional phytotherapy of some medicinal plants used by the Tharus of the Nainital district, Uttar Pradesh, India". *Int. J. Pharmacogn.* 32(1): 51–58.

Abstract: The Tharu tribe inhabits the Himalayan foothills from Nainital in the West to Darjeeling in the East, and utilize plants in the treatment of diseases and other disorders. The present study deals with the therapeutic uses of 63 plants used by the Tharus of the Nainital district, U.P., in health care. Local names, preparation of ethnomedicine, dosage and mode of administration have been provided by selected informants and experienced medicine men. The study has provided some interesting data concerning medicinal plants which may enable phytochemists and pharmacologists to determine their true therapeutic properties.

3029. **Singh, K.K. & Prakash, A. 1994.** "Indigenous phytotherapy among the Gond tribe of Uttar Pradesh, India". *Ethnobotany* 6: 37–41.

Abstract: The present communication reports first-hand information gathered on 38 ethnomedicinal plants traditionally used by Gond tribe of Sonbhadra district of Uttar Pradesh, for the treatment of various diseases and disorders. The Sonpar tribal area of Sonbhadra district was surveyed intensively to collect plants and plant products used in indigenous phytotherapy by the Gond tribe for their health care. The study provides information on local names, locality, ethnomedicinal recipes, dosages and mode of administration as practised by Gond medicinemen and healers. The medicinal plant wealth of the district is rich in raw materials needed for establishing herbal drugs collection and processing centres for human welfare.

3030. **Singh, K.K. & Prakash, A. 1995.** "Ethno-medico-botanical survey of Varanasi district, Uttar Pradesh". *NBRI Newsletter* 22(3): 35.

3031. **Singh, K.K. & Prakash, A. 1996a.** "Observations on ethnobotany of the Kol tribe of Varanasi district, Uttar Pradesh, India". *J. Econ. Taxon. Bot.,* Addl. Ser. 12: 133–137.

Abstract: The paper deals with an ethnobotanical survey and study among the Kol tribes of Naugarh block of Varanasi district, Uttar Pradesh, India. The Kol tribe is of Dravidian origin and live in remote tribal villages adjacent to the forest areas. They are mainly dependent on the ambient vegetation for their livelihood and health care. The study has brought to light a number of plant species of ethnobotanical value used for food, ethnomedicine, oil, fibre and other material culture by them.

3032. **Singh, K.K. & Prakash, A. 1996b.** "Traditional medicinal plant therapy used for skin care by tribals of Uttar Pradesh". *J. Non-Timber Forest Prod.* 3(1/2): 51–55.

3033. **Singh, K.K. & Prakash, A. 1998.** "Native plant remedies for liver disorders among the tribals of Uttar Pradesh, India". *Ethnobotany* 10: 136–137.

Abstract: The paper highlights the ethnomedicinal plant therapy of some potential species for the treatment of jaundice and other liver ailments among the Tharu, Kol, Gond, Kharwar and Korwa tribes of Uttar Pradesh. Species like *Cajanus cajan, Chloroxylon swietenia, Mallotus philippensis* and *Ricinus communis* are widely used by them for the treatment of jaundice and other liver ailments. The potential species for development of plant-based medicines having vital hepatoprotective agents are discussed.

3034. **Singh, K.K. & Prakash, A. 2003.** "Tribal wisdom on medicinal and economic plants". *Indian Medical Science Ser.* 131. Sri Satguru Publication, New Delhi. Pp. 183.

3035. **Singh, K.K. & Singh, S.C. 1985.** "Some medicinal plants in the folklore of Varanasi district, Uttar Pradesh". *Bull. Med.-Ethno-Bot. Res.* 6(1): 28–34.

3036. **Singh, K.K., Kalakoti, B.S. & Prakash, A. 1994.** "Traditional phytotherapy in the health care of Gond tribals of Sonbhadra district, Uttar Pradesh, India". *J. Bombay Nat. Hist. Soc.* 91(3): 386–390.

Abstract: The paper describes the traditional indigenous phytotherapy as practiced by Gond medicinemen. The information on local name, preparation of ethnomedicine recipes, dosage and mode of their administration, etc. have been discussed. The study provides new knowledge on the traditional uses of 44 medicinal plants, useful database for phytochemists and pharmacologists to determine their active compound after clinical trials for their safe use. There is good potential of medicinal plants in the area needed for establishment of herbal farm for processing and production of herbal medicine as well as generating employment schemes for the benefit of tribal and local population.

3037. **Singh, K.K., Painuli, R.M. & Lal, B. 1993.** Economic flora of Western Himalaya- In a conservation perspective. In: Dhar, U. (Ed.), *Himalayan Biodiversity Conservation Strategies.* GBPIHED, Almora. Pp. 231–243.

3038. **Singh, K.K., Pelvi, S.K. & Singh, H.B. 1980.** "Survey of some medicinal plants of Dharchula block in Pithoragarh district of U.P.". *Bull. Med.-Ethno-Bot. Res.* 1: 1–7.

3039. **Singh, K.K., Saha, S. & Maheshwari, J.K. 1985.** "*Ethnobotany of Helicteres isora* Linn. in Kheri district, Uttar Pradesh". *J. Econ. Taxon. Bot.* 7(2): 487–492.

Abstract: The plant *Helicteres isora* Linn. (Sterculiaceae) is extensively used by the Tharus of Kheri district for fibre, drug, craft and fuel materials. The species grows wild in abundance in the district. The germplm of this species can be utilised to develop modern cultivars of this wild economic plant to meet the increasing demand for its various useful products by establishing small scale industries in the district.

3040. **Singh, K.K., Saha, S. & Maheshwari, J.K. 1987.** "*Observation on the ethnobotany of Bhoxa tribe of Bajpur block of Nainital district*, U.P.". *Himal. Res. Develop.* 6: 25–29.

3041. **Singh, K.K., Saha, S. & Maheshwari, J.K. 1989.** "Ethnomedicinal uses of some ferns amongst the tribals of U.P.". *Indian Fern J.* 6: 63–67.

3042. **Singh, K.K., Srivastava, K., Khanna, R.K. & Sharma, M.L. 1993.** "Observation on some lesser known indigenous plants used for essential oils by the tribals of Uttar Pradesh, India". *Proc. Explor. Indig., Raw. Mat. Ess. Oil. Ind.:* 43–51.

3043. **Singh, K.P. & Agarwal, R. 2008.** "Ethnomedicinal studies on cucurbits of Agra district". *J. Econ. Taxon. Bot.* 32(Suppl.): 87–91.

Abstract: Cucurbits are well known as a source of human nutrition and are of major economic importance. The present communication deals with cucurbits of ethnomedicinal importance used by local people of Agra district. The study revealed the uses of 15 cucurbits as new to the existing knowledge in this field. People use

various parts of the plants for curing fever, cough, cold, headache, eczema, skin burns, heart problems, nervous disorders and urinary troubes. Some cucurbits are also used as tonic for old persons.

3044. **Singh, K.P., Garg, P. & Dhakre, G. 2009.** "Traditional usage of Mehandi (*Lawsonia inermis* L.)". *J. Econ. Taxon. Bot.* 33(Suppl.): 81–84.

Abstract: The present article describes the traditional uses of Mehandi (*Lawsonia inermis* L.) by different communities of Agra region of Uttar Pradesh. The information collected is based on personal interviews with the local and rural people.

3045. **Singh, L., Sharma, N., Joshi, S.P., Manhas, R.K. & Joshi, V. 2008.** "Ethnomedicinal uses of some weeds in some agro-ecosystems of Doon valley". *J. Econ. Taxon. Bot.* 32(Suppl.): 97–103.

Abstract: The present paper describes association of 51 species of weeds belonging to 45 genera under 26 families with rops in Doon valley. The ethnobotanical uses, especially ethnomedicinal, prevalent in the area have been documented along with vernacular names, family, phonological data, besides parts of plants used and ailments.

3046. **Singh, M. & Singh, M.P. 2012.** "Traditional uses of some most commonly used wild plants of district Jaunpur, U.P.". *J. Econ. Taxon. Bot.* 36(4): 874–885.

Abstract: Present paper enumerates highlights of floristic survey of most commonly used 75 wild plant species belonging to 35 families, which comprise total 21 blocks in 6 tehsils of district Jaunpur. The maximum number of plants used was 9 of family Asteraceae. Statistics of plant components used reveals maximum use of whole plant (43.35%) and most frequently used were herbs (55%) for different purposes. Physiography of the area and climate are also mentioned.

3047. **Singh, N. & Chauhan, S.V.S. 2002.** "Studies on the plants used in Govardhan Puja and 'Annakut' in Brij Mandal of Mathura". *Ethnobotany* 14: 73–77.

Abstract: Brij Mandal area (Mathura), has a tradition of Govardhan puja, which includes the offering of a special vegetable preparation known as 'Annakut' consisting of plant parts of as many as 51 species, 47 genera belonging to 21 families. The present investigation is based on the information collected from the older people of the area about the plants and their parts used for preparing 'Annakut'. The religious and scientific significance of Govardhan puja and Annakut has been discussed.

3048. **Singh, N., Pangtey, Y.P.S., Khatoon, S. & Rawat, A.K.S. 2009.** "Some ethnomedicinal plants of Ranikhet region, Uttaranchal". *J. Econ. Taxon. Bot.* 33(Suppl.): 198–204.

Abstract: The present communication is based on a survey of the folklore uses of medicinal plant in Ranikhet region of district Almora. An extreme field study in the remote localities of the district was carried out and information on the folk utilization of medicinal plants was gathered from the rural inhabitants. In the present study, as many as 44 plant species are reported as important ethnomedicines from Ranikhet region.

3049. **Singh, N., Swami, A., Gupta, B.K. & Grover, S.P. 1993.** "Some noteworthy medicinal plants of commercial potential of Doon valley". *Indian J. Phys. Nat. Sci.* 9(Sec. A): 24–33.

3050. **Singh, O.P., Singh, A.K. & Singh, R.B. 2017.** "Survey of some common medicinal plants of Hathras district of Uttar Pradesh (India) and their ethnomedicinal values". *Int. J. Bot. Stud.* 2(4): 32–33.

Abstract: Present manuscript mainly deals with 15 species of flowering plants belonging to 13 families used in medicine in and around Hathras district of Uttar Pradesh (India) especially on urban and rural areas. The information based on extensive survey of the area, gathering oral folklores and search of literature on medicinal plants and their ethnomedicinal importances.

3051. **Singh, P. & Attri, B.L. 2014.** "Survey of traditional uses of medicinal plants of Bageshwar valley (Kumaun Himalaya) of Uttarakhand, India". *Int. J. Conserv. Sci.* 5(2). 223–234.

Abstract: This paper communicates the traditional uses of medicinal plants of Bageshwar valley of Uttarakhand. Aims of the study were to document the medicinal plant and their indigenous traditional use patterns by local population. A total of 158 taxa belonging to 83 families were reported as locally used for various medicinal purposes. These medicinal plants used against various diseases e.g. asthma, cough, malaria, tuberculosis, cancer, abdominal pain, cholera, piles, tumor, headache, snakebites, jaundice, diarrhea, dysentery etc. Observation of the site showed that vegetation of the area was generally threatened due to deforestation, over grazing, habitat fragmentation, un-scientific extraction, and habitat loss. Measures for the conservation of plant resources especially medicinal plants of Bageshwar valley (Kuamun Himalaya) are urgently needed.

3052. **Singh, P.B. 2009.** "Medicinal plants of commercial importance found wild in Lalitpur district of Uttar Pradesh". *J. Econ. Taxon. Bot.* 33(4): *769–777.*

Abstract: Lalitpur is one of the medicinal plant rich districts of Bundelkhand region of Uttar Pradesh. The results of medico-botanical surveys conducted in the district during 2007-2008 are presented. A otal of 100 species of medicinal plants of commercial value found wild in the region are listed in tabular form. Information about the Sanskrit name of the plants, their life form, parts used, availability and distribution in the region are also provided.

3053. **Singh, P.K., Tiwari, R.K. & Singh, R.H. 2010.** "Medicinal plants used by tribal inhabitants of 'Nagwa' block of district Sonebhadra, Uttar Pradesh, India". *Int. J. Pl. Res.* 23(2): 86–104.

Abstract: The survey was conducted to record medicinally important plant species of 'Nagwa' block of district Sonebhadra. 99 ethnomedicinally important plant species belonging to 52 families were recorded with the help of tribal people and village medicine-men of the area. The study indicates that the area is floristically very rich and traditional medical system is well functioning in the area. The survey of the area shows that some of the important plants are declining because of overexploitation for economic values.

3054. **Singh, P.K., Kumar, V., Tiwari, R.K., Sharma, A., Rao, C.V. & Singh, R.H. 2010.** "Medico-ethnobotany of 'Chatara' block of district Sonebhadra, Uttar Pradesh, India". *Advanced Biol. Res.* 4(1): 65–80.

Abstract: Present study was conducted to record the ethnomedicinal wisdom of 'Chatara' block of district Sonebhadra. 156 ethnomedicinally important plant species belonging to 63 families were recorded with the help of tribal people and village medicine-men of the area. The study indicates that the traditional medical system is well functioning in the area. The survey of the area shows that some of the important plants are declining because of overexploitation and environmental disturbances.

3055. **Singh, R., Singh, D.K. & Agnihotri, R.K. 2020.** "Ethnobotanical studies of Harsingar (*Nyctanthes arbor-tristis* L.) of Agra region: A traditional medicinal plant". *Int. J. Bot. Stud.* 5(4): 121–124.

Abstract: *Nyctanthes arbor-tristis* is a small shrub tree belongs to Oleaceae family. It is a highly traditional medicinal plant known as Harsingar or Night Jasmine. It's native to India but distributed in Himalayan and Nepal region. It is found as ornamental plant in Indian garden and temple side. Ethnobotanical survey and informations about the plant, the five villages of Agra city nearby Yamuna bank followed by Runakta to Poiya Ghat were selected for observation. Ethnobotanical observations were made on plant of *Nyctanthes arbor-tristis* and major discussed by five villager rural people like Farmer, Vaidhya, Hakim and Medicine men of the district of Agra regarding, medicines, socio-religious beliefs and the material culture. Household survey was conducted on a random basis for obtain information on people's perceptions on conservation, amount of availability and uses of *N. arbor-tristis*. A structured interview method followed by set of questions was used for the study. The flowers leaves, fruits, bark and seed of this plant is extensively used in Ayurvedic medicine for the treatment of various diseases by local people of Agra region. Therefore, it should reproduced and promoted cultivation in rural as well in urban areas.

3056. **Singh, R.K. & Singh, A. 2009.** "Women's wisdom and indigenous human healthcare practices". *Indian J. Tradit. Knowl.* 8(2): 262–269.

Abstract: In the study, an effort was made to explore the diversities of indigenous knowledge systems pertaining to human health among rural women of the purposively selected villages of eastern part of Azamgarh district, Uttar Pradesh. Data pertaining to study were collected by using the participatory approach, group discussions, participant learning and personal interview methods. Results indicate that women are having their ancestral wisdom to cure many diseases. A range of indigenous fruits and tubers are utilized during drought and food scarcity to meet nutrition requirement for maintaining health. These indigenous practices of health were found to be appropriate on account of low cost, good efficacy and easy local availability.

3057. **Singh, S. 2010.** "Socio-economic aspects of the Van Gujjars– A tribal community of Pathri forest of Uttarakhand". *J. Non-Timber Forest Prod.* 17(1): 45–48.

Abstract: The paper enumerates plants used by the Van Gujjars inhabiting the Pathri forest, District Haridwar, Uttarakhand are a tribal community of Pathri forest. About 200 families of the Gujjars are lived in the forest. They are a pastord and nomadic muslim tribe. The pastralism of the Van Gujjars is based on their herd of buffaloes. The Economy of Van Gujjars is in shambles. The main source of their income is selling milk and ghee. They also use the forest plants for their uses.

3058. **Singh, S.C. 1984.** "A note on some home remedies available from kitchen stock in Eastern Uttar Pradesh". *J. Econ. Taxon. Bot.* 5(1): 149–150.

Abstract: The paper gives the information on fifteen plants used by the people of Eastern Uttar Pradesh in home remedies. Plant species are arranged alphabetically followed by family and local names.

3059. **Singh, S.C. 2004.** "Rare medicinal plants of Lucknow district". *J. Econ. Taxon. Bot.* 28(3): 617–622.

Abstract: In the present paper, 35 rare medicinal plants of Lucknow (U.P.) have been reported with botanical name, family, habit, habitat, medicinal uses and biological activities wherever available.

3060. **Singh, S.C. 2008.** "Anticancerous plants of Lucknow district". *J. Econ. Taxon. Bot.* 32(3): 681–690.

Abstract: While working on flora of Lucknow district, it was revealed that *ca* 143 plant species are either biologically active or sed against one or other type of cancer. The species are enumerated alphabetically with their known anticancer/cytotoxic activity against each plant species.

3061. **Singh, S.C. & Srivastava, G.N. 1999.** "Exotic medicinal plants of Lucknow district, U.P., India". *J. Econ. Tax. Bot.* 23(1): 223–235.

Abstract: An extensive survey of the flora of Lucknow district, U.P. was conducted and the study revealed the occurrence of one hundred thirty two medicinally useful exotic species which have been enumerated alongwity their family name, origin, medicinal uses, biological activity of various plant parts as a drug, local habitat and field book number(s). It has been observed that out of 132 plant species, about 36% of the species are native to America which has been estimated to be the largest in number whereas species of the Australian and Eurasian origin are poorly represented. In between these lie species of pantropical, Paleotropical, Asiatic, Indo-Malayan and European origin. African, Sino-Japanese and Mediterranean elements on average are moderately represented. Analysis of these exotic species revealed that about 15-16% exhibited anticancerous, cardio-vascular and antimicrobial activity while 0.75% have shown antibiotic and mosquito repellent activity.

3062. **Singh, S.C. & Srivastava, G.N. 2000.** "Weeds on the campus of Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow, U.P.". *J. Econ. Taxon. Bot.* 24(2): 451–466.

Abstract: In the present communication 187 weed species under 138 genera and 45 families of angiosperms occurring on and around the CIMAP campus, Lucknow in the cultivated fields of medicinal and aromatic plants are enumerated.

3063. **Singh, S.P. & Kumari, B. 2019.** "Selection of medicinal plants for cultivation in J.P. Nagar district (U.P.) to raise socio-economy of farmers". *Int. J. Bot. Stud.* 4(5): 1–3.

Abstract: Medicinal plants shows an important position in Ayurveda, Siddha and Unani medicine; and provide raw materials for cosmetic, drug, pharmaceuticals and other industries. Farmers can raise income via cultivation of the medicinal plants than other traditional crops. National Medicinal Plant Board (NMPB), India provide subsidy according to different plant species availability for production. Around 140 medicinal plants species listed under National Ayush Mission for cultivation. From which *ca.* 40 angiosperm plant species of climbers, herbs, shrubs and trees are found commonly and some are wild in Jyotiba Phule Nagar (Amroha) District of Uttar Pradesh. Cultivation of medicinal plants is the very good alternative for some traditional uneconomic crops for raise socio economy of farmers and help in medicinal plant protection.

3064. **Singh, S.P. & Roy, S.K. 1986.** "Some medicinal ferns from Mirzapur (Hathinala) forest". *Bull. Med.-Ethno-Bot. Res.* 7(3-4): 185–187.

3065. **Singh, S.P., Kumari, B. & Singh, K.K. 2018.** "Diversity and conservation status of socio-religious angiosperms of Amroha district of Rohilkhand region (U.P.), India". *Int. J. Advanced Scientif. Res. & Manage.* 1: 35–38.

Abstract: Amroha district came into existence on 15.4.1997 and its geographical area is 2470 Sq. km extending from Latitude 28° 54°North to 39° 6° North and Longitude 78°28' East to 78°39' East. The present study provides the information regarding the socio-religious importance of Angiosperms in Amroha district of Uttar Pradesh. The rural areas and forest patches of Amroha district were surveyed and covered extensively to record the socio-religious plant species. During the survey 53 species (dicot 41 and monocot 12) of angiosperms under 33 families have been recorded which are being used by the local people in various social and religious customs like marriage, worshiping, child birth, festivals and cremation. Poaceae family is dominating with 6 species followed by Papilionaceae with 5 and Euphorbiaceae, Moraceae and Lamiaceae with 3 species each. *Abrus precatorius* L. is rarely seen in two villages, *Nelumbo nucifera* Geartn. in few private ponds, *Bambusa vulgaris* Schrad., *Butea monosperma* (Lam.) Taub., *Prosopis cineraria* (L.) Druce, *Polyalthia longifolia* (Sonn.) Thwaites. and *Saraca indica* L. are important trees which seen in private gardens only. During the survey done by us and by the discussion with local villagers it has been concluded that due to modernization and escapism there has been decrease in the conservation and traditional importance (utility) of religious plants. Data clearly indicate that whole plant (25%) is used maximum followed by flowers (22%), leaves (14%) and seeds (12%). Other parts are used less than 10%. Rural people treat these plants like socio-religious entity and worship them. Unfortunately, there is no written proof and information is available regarding the uses of those plants in Amroha district. It is hoped that the present study may be useful to mankind. It will also inspire to conserve these plant species wherever possible.

3066. **Singh, U. & Narain, S. 2008.** "A short note on traditional remedy through plant wreath". *Ethnobotany* 20: 152–153.

Abstract: Indian scholars have not only developed conventional healing methods but also acquired many non-conventional healing excellences. In this work, a new aspect of ethnobotany, 'remedy through plant wreath', prevalent in the tribals of the Vindhyan region of UP, has been explored. The communication provides an enumeration of 10 plants with their uses.

3067. **Singh, U. & Narain, S. 2009.** "Ethnobotanical wealth of Mirzapur district, U.P.". *Indian Forester* 135(2): 185–197.

Abstract: Mirzapur district of Uttar Pradesh, covering land area 4,952 km^2, is a natural treasure of vast number of plants having ethno-botanical importance. The present study enumerates some common and extensively used ethno-medicinal plants. During the ethno-botanical survey in the district, 183 plants species belonging to 158 genera and 60 families have been collected. The medicinal informations were gathered by personal contact with the aborigines such as Kols, Musahar, Baiga, Pashaiya, Gond, Saharia, Panika, Kharwar, Agaria and others. Plants with botanical name, family, local name, part used are given. These plants are useful under rural healthcare system and for herbal drug industry.

3068. **Singh, U. & Narain, S. 2010.** "Traditional treatment of leucoderma by Kol tribes of Vindhyan region of Uttar Pradesh". *Indian J. Tradit. Knowl.* 9(1): 173–174.

Abstract: The communication provides a brief account of a time-tested remedy by tribes from latex of *Telosma pallida* (Roxb.) Craib. and plant paste of *Launaea asplenifolia* (Willd.) Hook. f. against leucoderma. The practice is quite popular among the tribes of Vindhyan region of Uttar Pradesh. The text deals with method of treatment and results of tribal practices.

3069. **Singh, V. & Srivastava, S.K. 2014.** "Utlization of wild plants during *Tinchhath* festival in eastern Uttar Pradesh". *Ethnobotany* 26: 103–105.

Abstract: Sacred plant species are an integral part of Indian folklore. These play a vital role in the life of Indigenus people in their traditional festival and rituals. The present communication deals with traditional uses of wild lants during the sacred *Tinchhath* festival in some part of eastern Uttar Pradesh. Detailed account of these is provided with current accepted names, vernacular names along with family and mode f uses. Role of these in cultural and religious beliefs also reveal in their conservation and protection in natural habitat.

3070. **Singh, V., Gaur, R.D. & Bohra, B. 2008.** "A survey of fodder plants in mid-altitude Himalayan range lands of Uttarakhand, India". *J. Mountain Sci.* 5: 265–278.

Abstract: Himalayan rangelands, the crucial but by and large the neglected ecosystems, are an integral part of mountain farming systems. The present investigation is based on the extensive survey and collection of mid-altitude range plants from Almora and Champawat districts of Kumaun division in the Uttarakhand Himalaya in India, from September 2003 to June 2007. The rangelands studied were oak types, chirpine types, grass types and mixed ones. Some 300 species of grasses, other herbaceous plants, trees and shrubs were found in the mid-altitude rangelands. A sizeable number of species belonged to the family of Poaceae. The grass-dominated rangelands especially harboured a variety of grass species of good fodder value. The diversity of fodder plants is a proportion of the enormous biodiversity occurring in the parts of the Himalaya. A panorama of the biodiversity emerged in this study, which is of both intangible value and direct value for the livestock-and rangeland-dependent mountain communities, suggests a very high scope of the utilization of this natural and uncultivated biodiversity for supporting livestock-based livelihoods of the region. This biodiversity also has enormous bearing on the cultivated area of the region.

3071. **Singh, V.K. 1992.** Exploitation and threat to some medicinal plants and folk drugs of Garhwal and Kumaun regions of Uttar Pradesh, India. In: Dhar, U. (Ed.), *Himalayan Biodiversity: Conservation Strategies*. Gyanodaya Prakashan, Nainital. Pp: 107–412.

3072. **Singh, V.K. & Ali, Z.A. 1989.** "Folk medicines of Aligarh (Uttar Pradesh), India". *Fitoterapia* 60(6): 483–490.

3073. **Singh, V.K., Ali, Z.A. & Siddiqui, M.K. 1996.** "Ethnomedicine in the Bahraich district of Uttar Pradesh". *Fitoterapia* 67(1): 65–76.

3074. **Singh, V.K., Ali, Z.A. & Siddiqui, M.K. 1997.** "Medicinal plants used by the forest ethnics of Gorakhpur district (Uttar Pradesh), India". *Int. J. Pharmacogn.* 35(3): 194–206.

Abstract: Based on an ethnopharmacological survey of the Gorakhpur district, this report deals with 107 plant species belonging to 100 genera and 53 families that are commonly used by different ethnic groups as folk drugs for treatment of various human and cattle diseases and conditions. It lists 166 medicinal uses.

3075. **Singh, V.K., Anis, M. & Khan, A.M. 1984.** "Endangered medicinal plants of Chakrata forests, Uttar Pradesh, India". *J. Pl. Nature* 1: 36–40.

3076. **Singh, V.K., Ali, Z.A., Zaidi, T.H. & Husain, W. 1989.** "Medicinal plants employed by the rural population of Mainpuri forest division, Uttar Pradesh, India". *New Botanist* 16(1-4): 137–145.

3077. **Singh, V.K., Ali, Z.A., Zaidi, T.H. & Siddiqui, M.K. 1996.** "Ethnobotanical used of plants from Gonda district forest of Uttar Pradesh". *Fitoterapia* 67(2): 129–139.

3078. **Singh, V.P. & Srivastava, R.C. 2003.** "Economic importance of sedges of Uttar Pradesh". *J. Econ. Taxon. Bot.* 27(4): 978–981.

Abstract: The paper throws light on the economically important cyperaceous taxa found in Uttar Pradesh. The sedges family Cyperaceae is represented in the state by 128 species, 1 sub-species and 7 varieties belonging to 17 genera out of which 31 species belonging to 11 genera are used for various purposes in different localities of the state.

3079. **Sinha, B. & Maikhuri, R.K. 1998.** Conservation through socio-cultural-religious practices in Garhwal Himalaya: A case study of Haryali sacred forest. In: Ramakrishnan, P.S., Saxena, K.G & Chandrasekhar, U. (Eds.), *Conserving the Sacred for Biodiversity Conservation*. UNESCO and IBH Publishing Co. Pvt. Ltd., New Delhi. Pp. 289–300.

3080. **Srivastav, P.K., Sandeep, Mishra, P.N. & Khan, M.A. 2009.** "Medicinal plants of sericultural gardens of Dehra Dun". *J. Econ. Taxon. Bot.* 33(Suppl.): 163–179.

Abstract: The present communication deals with the medicinal plants of seven sericultural gardens of Dehra Dun district of Uttarkhnad. In all 75 medicinal plants are enumerated along with their family, brief description and medicinal uses.

3081. **Srivastav, P.K., Thapliyal, C., Chamoli, M., Bhat, M.M. & Khan, M.A. 2011.** "Utilization and conservation of medicinal plants of sericulture gardens". *Ann. Forest.* 19(1): 51–64.

Abstract: Sericulture is facing tough time in Uttarakhand due to bivoltine crops, limited land resources and competition with other crops. Therefore, farmers are not earning

much from sericulture. Medicinal plants grow as undersirable vegetation in various barren and cultivated lands viz., agricultural lands, fruit orchards, sericultural gardens, vegetable gardens or else also as wild plants in the forests. In current scenario, due to growing awareness about the health hazarads from allopathic medicines, the importance of medicinal plants has increased manifold among the general mass. Therefore, natural harmony between sericulture and medicinal industries for suitable co-existence should be developed. Present communication deals with nearly 48 species of medicinal plants growing in mulberry garden of Regional Sericulture Research Station, Sahaspur, Dehra Dun. All the 48 species have been described along with botanical name, local name, family, habit, economic importance and strategies for their utilization and conservations.

3082. **Srivastav, P.K., Thapliyal, C., Chamoli, M., Bhat, M.M., Khan, M.A. & Rawat, M.S. 2009.** "Intercropping of medicinal plants in sericultural gardens of Dehra Dun, Uttarakhand". *J. Non-Timber Forest Prod.* 16(1): 27–34.

Abstract: Present communication deals with the studies made on inter-cropping of some medicinal plants viz. *Aloe barbadensis*, *Andrographis paniculata*, *Asparagus racemosus*, *Plumbago zeylanica*, *Rauvolfia serpentina*, *Acorus calamus* and *Cyperus scariosus* under three spacings of Mulberry cultivation either as tree or bush plantations. Survival and growth of all the medicinal plants was observed to be maximum under 10'x10' spacing of Mulberry cultivated as trees. On the basis of these studies, it may be inferred that cultivation of *Andrographis paniculata*, *Asparagus racemosus*, *Plumbago zeylanica* and *Acorus calamus* may successfully be practiced in the Mulberry gardens of Uttarakhand. However, further studies are under progress on allelopathy and bio-assay with respect to inter-cropping of medicinal plants vis-a-vis silkworm rearing.

3083. **Srivastava, C. 2009.** "Diversity of medicinal plants in North Eastern Uttar Pradesh". *J. Econ. Taxon. Bot.* 33(Suppl.): 231–275.

Abstract: The present paper provides an account of the medicinal plants wealth of North eastern Uttar Pradesh. The study has revealed the occurrence of 509 species of medicinal plants belonging to 369 genera and 114 families. Botanical names, common/vernacular names, family, flowering and fruiting period, habi and medicinal uses are provided. Such an study will not only be useful in sustainable utilization of resources, but also in taxonomic enumeration of flora of Uttar Pradesh, which is yet to be published.

3084. **Srivastava, C. & Pande, S. 2011.** "Medicinal status of Solanaceous plants in Uttar Pradesh: A review". *J. Econ Taxon. Bot.* 35(4): 658–667.

Abstract: The Solanaceae, Nightshade or potato family, is one of the important plant family in the world. It incudes many species which are essential for life. Plants of this family serves as a good source of medicine, e.g., *Atropa acuminata* Royle, with atropine as a ingradient used in ophthalmology, as a dilator of the pupil of the eyes; *Withania somnifera* (L.) Dunal, Aswagandha, an effective rejuvenator and restoratives, also called 'Indian Ginseng'; throne apple leaves (*Datura* species) used in cigarettes as a bronchodilator for asthmatic patient and (Luxury) tobacco (*Nicotiana* species). There are also many edible as well as medicinally important species in this family such as Potato (*Solanum tuberosum* L.), eggplant (*Solanum melongena* L.), tomato [*Lycopersicon lycopersicum* (L.) Karsten.], Capsicum (*Capsicum* species) and cape gooseberry (*Physalis peruviana* L.) etc. The medicinal properties of the plant are due to presence of some active compound or compounds that produce a definite physiological action on the human body. The paper highlights the botanical names, common names, active principles and medicinal uses of solanaceous plants of Uttar Pradesh.

3085. **Srivastava, C. & Srivastava, A.K. 2008.** "Antidiabetic plants of Eastern Uttar Pradesh". *J. Econ. Taxon. Bot.* 32(3): 710–718.

Abstract: In the present paper an attempt has been taken to enumerate the medicinal plants of eastern Uttar Pradesh which are found to be useful in the reatment of diabetes. A brief discussion about 48 plants, their common/vernacular names along with their families, chemical constituents (wherever known) and uses are provided.

3086. **Srivastava, C., Singh, H.N. & Srivastava, R.C. 2003.** Medicinal plants of Gorakhpur (U.P.). In: Kumar, Arvind (Ed.), *Proc. Natl. Symp.* Sci. *Ethics. Env. Care Sustainability*. Pp. 211–250.

3087. **Srivastava, N. 2015.** *Medicobotany of Garhwal Himalaya*. Deep Publ., New Delhi.

3088. **Srivastava, N. & Kumar, S. 2003.** "Drug plant resources of Doon Valley". *Ann. Forest.* 11(1): 63–84.

Abstract: The Doon valley represents one of the most important reservoirs of medicinal plant resources in outer Himalayas and is seriously threatened due to various anthropogenic factors. The present paper deals with *ca* 170 important drug yielding plant species and provides information on their botanical names, plant families, vernacular names, flowering and fruiting period, medicinal uses and localities.

3089. **Srivastava, P.K., Khanna, K.K. & Mudgal, V. 1992.** "New traditional herbal remedies from the rural folklore of Hamirpur district, Uttar Pradesh". *J. Econ. Taxon. Bot.,* Addl. Ser. 10: 399–404.

Abstract: The paper deals with unreported medicinal uses of 44 plant species (belonging to 25 families) recorded from the rural folklore of Hamirpur district, Uttar Pradesh. Informations on local names, ethnomedicinal uses, dosage, mode of administration and locality have been presented in this paper. An analysis of data pointed out that seven plant species are employed for the treatment of leucorrhoea, followed by six plant species to treat fever and four plant species to treat tuberculosis. However, three plants are referred to treat theumatism, eye diseases and as lactagogue. On the other hand, one or two plant species are referred to treat a number of other diseases like diarrhoea, earache, cancer, mouthsore, leucoderma, pyorrhoea, piles, etc.

3090. **Srivastava, R.C. & Srivastava, C. 2007.** "Diversity and economic importance of wetland flora of Gorakhpur district (U.P.)". *J. Econ. Taxon. Bot.* 31(1): 70–77.

Abstract: The paper throws light on diversity of angiosperms in wetlands of Gorakhpur district. Botanical names, local names, family, flowering and fruiting period and uses (wherever known) of 99 species are provided.

3091. **Srivastava, R.C., Singh, V.P. & Singh, M.K. 2003.** "Medicinal plants of Jaunpur district (U.P.)". *J. Econ. Taxon. Bot.* 27(1): 148–159.

Abstract: The paper provides an account of 166 species under 136 genera and 67 families of medicinal angiosperms of Jaunpur district of Uttar Pradesh. Local names, flowering and fruiting period, localities of occurrence and medicinal uses are given.

3092. **Srivastava, S.K. 2010a.** Medicinal Plant Diversity and Conservation Strategies in Uttarakhand– An Overview. Souvenir of the National Seminar on Medicinal Plants of the Himalaya– Potential and Prospect, Pp. 33–54. Organized by Regional Reserch Institute of Himalayan Flora, CCRAS, Tarikhet on 16–17 September 2010.

3093. **Srivastava, S.K., Tewari, J.P. & Shukla, D.S. 2008.** "A folk dye from leaves and stem of *Jatropha curcas* L. used by Tharu tribes of Devipatan division". *Indian J. Tradit. Knowl.* 7(1): 77–78.

Abstract: The leaves and stem of *Jatropha curcas* L. (physicnuts) can be used as a natural source of dye was noticed from Tharu villagers of Devipatan division, Uttar Pradesh. The colouring matter was extracted from leaves and stems by boiling in water. The extract was evaporated to dryness. The extracted matter was used to dye cotton yarn using different methods. The dyed cotton yarn was tested for its fastness and other properties. It was found superior to synthetic chemical dyes.

3094. **Subrahmanyeswari, B. & Chander, M. 2013.** "Integrating indigenous knowledge of farmers for sustainable organic farming: An assessment in Uttarakhand state of India". *Indian J. Tradit. Knowl.* 12(2): 259–264.

Abstract: Success of organic farming largely depends on farmers' knowledge of ecological systems, environment and on-farm renewable resources, as per the principles of organic farming. A study has been conducted to know the traditional knowledge and indigenous practices being followed by farmers in agriculture and animal husbandry to assess the possibility of integrating with organic farming in Uttarakhand, which is the first state in India promoting organic farming in a systematic way. The farmers of Uttarakhand especially women possessed a vast pool of indigenous knowledge with regards to livestock management leading to reduced dependence on externally purchased inputs as required under organic farming systems. And the farmers were in the practice of utilizing renewable farm resources. The Uttarakhand Organic Commodity Board (UOCB) had taken initiatives like compiling farmers' age old knowledge, "sayings" and "practices" relating to natural resource management in the form of booklets to protect it from gradual extinction and integrating it successfully with organic production methods. Such knowledge and practices of farmers is worth validating and exchanging with the other parts of the world to make organic agriculture sustainable.

3095. **Sundriyal, R.C. 2005.** "Medicinal plant collection and conservation in the Himalaya: An agenda for action". *Indian Forester* 131(3): 410–424.

Abstract: This paper highlights strategy for large scale cultivation and long-term conservation of medicinal plants involving different stakeholders in the Himalaya. It is emphasized that the focus of the cultivation could be protection of endangered species

and/or achieving the target of higher income by raising and cultivating market demanding species. The paper discusses selection of potential Medicinal and Aromatic Plants (MAPs) broadly recommended for the region and ways and means of domestication, value addition, product formulation, processing, conservation, infrastructure, and R&D support desired for cultivation of medicinal plants. Designs for marketing and possible funding sources are also given. It is highlighted that if cultivation of MAPs is planned properly, it could be emrge as a potential sector to support large number of people with high revenue generation.

3096. **Sundriyal, R.C., Joshi, N. & Joshi, A.P. 1987.** "Some important medicinal plants of alpine pastures of Garhwal Himalaya". *J. Econ. Taxon. Bot.* 11(2): 459–462.

Abstract: An investigation was carried out to trace the medicinally important plants of Garhwal alpine. A total of 37 plant species comprising 21 families have been evaluated for their medicinal utility.

3097. **Sundriyal, R.C., Negi, S.C., Joshi, A.P. & Dhasmana, R. 1985.** "Some important medicinal trees of Kotdwara, Lansdowne and vicinity". *Himal. Chem. & Pharmaceut. Bull.* 2: 45–48.

3098. **Tamta, B.P., Kumar, V. & Ahamed, N. 2019.** "Habitat characteristics of selected medicinal plants of Alpine and Subalpine zone of Uttarakhand". *J. Non-Timber Forest Prod.* 26(3): 159–163.

Abstract: The shrinking natural habitats due to unscientific harvesting, grazing pressure and climate change have severely threatened the medicinal plant resources. This paper presents the observation on the population, habitat and occurrence of 3 medicinal plants viz. *Aconitum heterophyllum, Nardostachys jatamansi* and *Picrorhiza kurrooa* in the Kandara and Khulia Medicinal Plant Conservation Areas (MPCAs) of Uttarakhand based on studies conducted by the author.

3099. **Tewari, I. & Tewari, K.C. 2010.** Medicinal plants: Some tribal-folk medicinal claims from Uttarakhand Himalaya. In: Tewari, L.M., Pangtey, Y.P.S. & Tewari, G. (Eds.), *Biodiversity Potential of the Himalaya.* Gyanodaya Prakashan, Nainital. Pp. 363–380.

3100. **Tewari, L.C., Sanwal, P., Singh, J. & Joshi, P. 1984.** "Preliminary phytochemical screening of medicinal plants of hilly districts (Kumaun and Garhwal divisions) of U.P.". *Bull. Med.-Ethno-Bot. Res.* 5: 71–81.

3101. **Tewari, L.C., Agarwal, R.G., Pandey, M.J., Uniyal, M.R. & Pande, G. 1990.** "Some traditional folk medicines from the Himalaya". *Aryavaidyan* 4: 49–57.

3102. **Tewari, L.M. & Pande, P.C. 2006.** "Ethnoveterinary plants of Uttarkashi district, Uttaranchal, India". *Ethnobotany* 18: 139–144.

3103. **Tiwari, D., Pande, P.C. & Tiwari, L. 2007.** "Ethno-veterinary herbal medicines of Dwarahat area of Central Himalayas". *Indian Forester* 133(3): 379–390.

Abstract: The present paper deals with the utilization of plants and plant products in relation to the ethnoveterinary medicines of Dwarahat area of Uttarakhand Himalayas. Ethno-veterinary survey was conducted during 2003 and information on medicinal plants and their mode of therapeutic uses, local names were gathered from the villagers and experienced people. The aim of the present study is to document the traditional

veterinary medicinal information against the diseases and disorders. Many of traditional practices and treatments are very unique and effective.

3104. **Tiwari, J.K. 1986.** *Ethnobotanical Study of the Medicinal Plants of Garhwal*. Ph. D. Thesis, H.N.B. Garhwal University, Srinagar. (unpublished)

3105. **Tiwari, J.K., Ballabha, R. & Tiwari, P. 2010a.** "Some promising wild edible plants of Srinagar and its adjacent area in Alkananda valley of Garhwal Himalaya, India". *J. American Sci.* 6(4): 167–174.

Abstract: The present communication deals with the ethnobotanical exploration, identification, concerns and future potentialities of the wild edible plant species consumed by the local people inhabiting in the hilly areas of Alaknanda valley that fall in the Uttarakhand state of India. A total of 55 plant species belonging to 35 families were recorded from the study area. Amaranthaceae, Lamiaceae and Moraceae were the dominant families with 4 species each, while Anacardiaceae, Fabaceae, Rosaceae and Rutaceae followed with 3 species and rest were represented by one species from each family. The four major life forms were herbs, shrubs, climbers and trees. Herbs made the highest proportion of the edible species (18) followed by trees (17), shrubs (13) and climbers (7). The plant species were divided into two classes - consumed as raw and prepared in to vegetables. 32 species belonged to the former category while the later was represented by 23 plants.

3106. **Tiwari, J.K., Ballabha, R. & Tiwari, P. 2010b.** "Ethnopaediatrics in Garhwal Himalaya, Uttarakhand, India (Psychomedicine and Medicine)". *New York Sci. J.* 3(4): 123–126.

Abstract: Garhwal Himalaya has its peculiar topography, vegetation, people and traditions. In the remote areas traditional customs and beliefs are still maintained and modem trends are yet to reach, which provide interesting scope of ethnobotanical studies. The present paper pertains to typical practices in ethnopaediatrics in Garhwal Himalaya, India. The inhabitants use different plants in primary health care of children. Different charms and amulets associated with the common ailments of children have been discussed.

3107. **Tiwari, J.K., Ballabha, R. & Tiwari, P. 2010c.** "Diversity and present status of the medicinal plants in and around Srinagar Hydroelectric Power Project in Garhwal Himalaya, India: Needs for conservation". *Researcher* 2(2): 50–60.

Abstract: The present study has been carried out in Alaknanda valley around Srinagar Hydroelectric Power Project in Garhwal Himalaya, India, to document the medicinal uses of plants and their status of availability in the area. A total of 102 species belonging to 92 genera and 54 families were recorded from the study area. Out of the documented species 32 were herbs, 27 shrubs, 30 trees and the rest 13 were climbers. Of all the recorded plant species, 26 were abundant, 57 common and 19 uncommon to this area. A list of plant species along with their local names, plant part (s) used and mode of administration in different ailments has been given which can be utilized in the future for technological advancement, economic prosperity and providing employment opportunity to the local people. A management plan for conservation of medicinal plants in the hydroelectric power project area is also suggested.

3108. **Tiwari, J.K., Dangwal, L.R., Rana, C.S., Tiwari, P. & Ballabha, R. 2010.** "Indigenous uses of plant species in Nanda Devi Biosphere Reserve, Uttarakhand, India". *Report & Opinion* 2(2): 58–61.

Abstract: The present study has been carried out in the Nanda Devi Biosphere Reserve, Uttarakhand, India, to document the ethnobotanical uses of plants. A total of 41 species belonging to 40 genera and 26 families have been reported. Plant species commonly used by local people for food, fodder, medicine and in other fields of their lives are enumerated. A list of plant species along with their local names, plant part(s) used and mode of application has been given. The findings can be utilized in the future for technological advancement, economic prosperity and providing employment opportunity to the local people.

3109. **Tiwari, L. & Pande, P.C. 2006a.** "Ethnoveterinary plants of Uttarkashi district, Uttaranchal, India". *Ethnobotany* 18: 139–144.

Abstract: The present study carried out in Uttarkashi district, Uttaranchal, India, led to documentation of 50 plant species used in ethnoveterinary medicines. The paper gives details of botanical identity, local names, parts of the plant used, mode of preparation, administration of the drug and diseases for which the given plants/ parts are used.

3110. **Tiwari, L. & Pande, P.C. 2006b.** "Indigenous veterinary practices of Darma valley of Pithoragarh district, Uttaranchal". *Indian J. Tradit. Knowl.* 5(2): 201–206.

Abstract: The people residing in Darma valley known as Darmi or Darmi Bhotiyas have great wisdom of traditional knowledge about the animal husbandry and veterinary practices. They cure their animals with the help of surrounding natural resources such as plants, animals, minerals, etc. They produce traditionally hybrids of yak and local cow. However, these practices are in danger of extinction because of the rapid modernization. The paper documents the traditional veterinary practices and animal husbandry of Darmies of Pithoragarh district of Uttanachal.

3111. **Tiwari, L. & Pande, P.C. 2006c.** "Ethno-veterinary medicines of holy Doonagiri hills of Uttaranchal". *J. Econ. Taxon. Bot.* 30(Suppl.): 151–162.

Abstract: The paper deals with the ethno-veterinary medicines of Doonagiri area of Almora district. In all 50 ethno-veterinary plants are reported along with their mode of preparation and application to the diseases and disorders.

3112. **Tiwari, L. & Pande, P.C. 2010.** "Ethnoveterinary medicines in Indian perspective: Reference to Uttarakhand, Himalaya". *Indian J. Tradit. Knowl.* 9(3): 611–617.

Abstract: Ethnoveterinary medicine is the holistic interdisciplinary study of the local knowledge and the socio-cultural structures and environment associated with animal healthcare and husbandry. The investigation is aimed at clearing some facts and Indian concepts of ethnoveterinary science. The paper deals with 23 household plants and plant products which are used in the treatment of animal diseases by local people and tribes of Uttarakhand.

3113. **Tiwari, L.M., Singh, N., Upreti, K. & Pangtey, Y.P.S. 2008.** *Medicinal Plants of Ranikhet.* Consul Book Depot, Nainital.

3114. **Tiwari, R. & Rana, C.S. 2015.** "Phytomedicine for the diabetes: A traditional approach". *Ann. Phytomed.* 4(1): 108–110.

Abstract: Present study has been carried out in the remote region of Uttarakhand, Himalaya. Faith herbal healers are those persons, who are curing various diseases and ailments of the local inhabitants of the remotest regions. This information is vanishing due to any reason which should be documented. Diabetes is a serious problem for all human beings, at any age groups, in the present scenario. A total of 17 plants have been identified in the present study, out of which 12 were herbs, 3 were shrubs and 2 were trees, respectively.

3115. **Tiwari, S. & Pandey, I.B. 2012.** "Traditional herbal remedies for gynaecological problems practised in Kanpur division of Uttar Pradesh (UP), India". *Ethnobotany* 24: 132–135.

Abstract: An ethnomedico-botanical survey of Kanpur division of Uttar Pradesh (UP), was undertaken during 2005-2009 to record traditional herbal remedies used by rural and urban women for treating gynaecological problems. Twenty plant species belonging to 16 families were found to be widely employed in the traditional herbal treatment of these problems.

3116. **Tomar, A. 2007.** "Some medicinal Plants used as an antipyretic among the rural and common people in Meerut district of western Uttar Pradesh". *J. Non-Timber Forest Prod.* 14(3): 215–218.

Abstract: In the present paper nineteen medicinal angiospermic plant species belonging to sixteen families and nineteen genera, which are useful in different type of fevers, have been discussed. These nineteen plants have antipyretic activities. These plants species are used as folk medicines in fever by Vaidhya or Hakim, rural and common people in Meerut district.

3117. **Tomar, A. 2009.** "Folk medicinal uses of plant roots from Meerut district, Uttar Pradesh". *Indian J. Tradit. Knowl.* 8(2): 298–301.

Abstract: The paper enumerates 39 medicinal plant species belonging to 39 genera and 28 families, which are used as folk medicine in the treatment of various ailments or diseases by the rural and common people of Meerut district.

3118. **Tomar, A. 2012.** "Medicinal uses of *Aegle marmelos* (L.) Corr. and *Bacopa monnieri* (L.) Pennell to cure thyroid". *J. Non-Timber Forest Prod.* 19(4): 301–302.

Abstract: The paper highlights *Aegle marmelos* (L.) Corr. and *Bacopa monnieri* (L.) Pennell to cure thyroid by the rural and common people of Uttar Pradesh, India.

3119. **Tomar, A. 2013.** "Method and composition for treatment of eczema in Uttar Pradesh, India". *J. Non-Timber Forest Prod.* 20(4): 281–284.

Abstract: The present invention highlights of herbal composition of *Citrus limon*, *Trapa natans*, *Tegetes erecta*, *Azadirachta indica* and *Sesamum indicum* to cure eczema.

3120. **Tomar, A. 2014a.** "Use of *Adenocalymma alliaceum* (Lam.) Miers (Lehsunbel) to cure gastric trouble". *J. Non-Timber Forest Prod.* 21(2): 127–128.

Abstract: In this paper a brief description of *Adenocalymma alliaceum* (Lam.) Miers is provided with its medicinal uses to cure gastric trouble in Meerut district of Uttar Pradesh.

3121. **Tomar, A. 2014b.** "Ethnomedicinal uses and socio-economic importance of family Amaranthaceae in Uttar Pradesh". *J. Non-Timber Forest Prod.* 21(3): 193–196.

Abstract: This paper highlights a brief description of family Amaranthaceae is provided along with its ethnomedicinal uses. Angiosperms include 1 family belong to 4 genera and 5 plant species have been enumerated from Uttar Pradesh with focus on their ethnomedicinal uses.

3122. **Tomar, A. 2015a.** "Utilization and medicinal uses of *Eucalyptus* in Uttar Pradesh, India". *J. Non-Timber Forest Prod.* 22(4): 43–46.

Abstract: In this paper a brief description of *Eucalyptus* is provided along with its utilization and importance. It is one of the fastest growing trees in the world and many species attain great heights. It is popularly known as Safeda and Gum tree, several species are cultivated in this region of Uttar Pradesh. Wood is buying back with rate of kg. 12-14 Rs./kg. One plant becomes sale out minimum Rs. 2500-–3000. Large scale plantations have been raised in government owned and private farm lands, the planting is continuing. *Eucalyptus* supplies for people and industries and has helped to reduce pressure on natural forests. The economics of its plantations varies depending upon the use to which it is put. Firewood is the main source of energy in Uttar Pradesh. The *Eucalyptus* wood which is marketed is used either as firewood or as pulpwood by the paper and rayon industries. Its wood has been tried as timber for constructional purpose, furniture making. Wooden floor, Charcoal and Pulp and Paper. It is also used to preparation of folk medicine in this area. These species are grown and identified as major species, *Eucalyptus globulus* Labill, *E. umbellata* Domin, *E. paniculata* Sm., *E. citriodora* Hook., *E. rudis* and *E. camaldulensis* Dehnh. in Uttar Pradesh.

3123. **Tomar, A. 2015b.** "Medicinal use of *Calendula officinalis* L. to cure chronic Urticaria". *J. Non-Timber Forest Prod.* 22(4): 233–234.

Abstract: In this article a brief description of *Calendula officinalis* L. is provided along with its medicinal uses to cure chronic urticaria in Meerut district of Uttar Pradesh.

3124. **Tomar, A. 2016a.** "Folk medicinal use of *Alstonia scholaris* R.Br.". *J. Non-Timber Forest Prod.* 23(1): 59–60.

Abstract: The present paper highlights a brief description of *Alstonia scholaris* R. Br. belongs to Apocynaceae family is provided along with its medicinal uses in Meerut district of Uttar Pradesh.

3125. **Tomar, A. 2016b.** "Medicinal use of *Bryophyllum pinnatum* Kaurz. to cure Cholera". *J. Non-Timber Forest Prod.* 23(2): 109–110.

Abstract: This paper highlights a brief description of *Byrophyllum pinnatum* Kurz. (Crassulaceae) is provided along with its medicinal uses to cure Cholera in Meerut district of Uttar Pradesh.

3126. **Tomar, A. 2016c.** "Medicinal use of *Abutilon indicum* (L.) Sweet (Kanghi) to cure boil and ulcer". *J. Non-Timber Forest Prod.* 23(3): 157–158.

Abstract: In this paper a brief description of *Abutilon indicum* (L.) Sweet (Malvaceae) is provided along with its medicinal uses to cure boil and ulcer in Meerut district of Uttar Pradesh.

3127. **Tomar, A. 2017a.** "Medicinal use of *Acorus calamus* L. (Bach) to cure fever". *J. Non-Timber Forest Prod.* 24(1): 47–48.

Abstract: The present paper highlights a brief description of *Acorus calamus* L. (Araceae) is provided along with its medicinal use to cure fever in Meerut district of Uttar Pradesh.

3128. **Tomar, A. 2017b.** "Folk medicinal use of *Allium cepa* L. to cure painful joints and inflammatory swelling". *J. Non-Timber Forest Prod.* 24(1): 69–70.

Abstract: In this paper a brief description of *Allium cepa* L. belongs to Liliaceae family is provided along with its medicinal use to cure painful joints and inflammatory swelling in Daurala, Meerut district of Uttar Pradesh.

3129. **Tomar, A. 2017c.** "Phytomedicinal importance of *Adhatoda zeylanica* Medic.". *J. Non-Timber Forest Prod.* 24(2): 99–100.

Abstract: This paper highlights a brief description of *Adhatoda zeylanica* Medic. (Acanthaceae) is provided along with its medicinal use to cure malarial fever in Meerut district of Uttar Pradesh.

3130. **Tomar, A. 2017d.** "Medicinal use of *Bauhinia variegata* L. (Kachnar) to cure ulcers". *J. Non-Timber Forest Prod.* 24(3): 173–174.

Abstract: In this paper highlights a brief description of *Bauhinia variegata* L., belongs to Caesalpinaceae family is provided along with its medicinal use to cure ulcers in Meerut district of Uttar Pradesh.

3131. **Tomar, A. 2017e.** "Medicinal use of *Hygrophila auriculata* Schumach. to cure stone in kidney". *J. Non-Timber Forest Prod.* 24(4): 249–250.

Abstract: In this paper highlights a brief description of *Hygrophila auriculata* Schumach. belongs to the family Acanthaceae is provided along with its medicinal use to cure stone in kidney of Mawana, Meerat district of Uttar Pradesh.

3132. **Tomar, A. 2018.** "Medicinal use of *Boerhavia diffusa* L. (Santh) to cure jaundice". *J. Non-Timber Forest Prod.* 25(1): 47–49.

Abstract: The paper highlights the use of *Boerhavia diffusa* L. to cure jaunce in some parts of Meerat district of Uttar Pradesh.

3133. **Tomar, A. & Singh, H. 2005.** "Folk-Medicinal uses of some indigenous plants of Baghpat district of Uttar Pradesh, India". *J. Non-Timber Forest Prod.* 12(3): 167–170.

Abstract: Ethnobotanicai knowledge is very ancient in India. Folk medicinal plant survey in Baghpat region was conducted from January 2004 to February 2005. The present communication enumerates about Twenty eight Taxa of medicinal plants. While surveying the area, stress had been laid to collect first hand information on the local folk medicinal claims of plants pertaining to various diseases. A total of 28 such claims on folk-medicinal uses of plants have been gathered from villagers, sanyasis, vaidhyas, hakims and medicinemen of the area and reported for the first time.

3134. **Tomar, A. & Singh, H. 2006.** "Exotic medicinal plants from Baghpat district, Uttar Pradesh, India". *J. Non-Timber Forest Prod.* 13(4): 273–280.

Abstract: Baghpat District comprises of six blocks (Chaprauli, Baraut, Binoli, Baghpat, Pilana and Khekra) of three Tehsil (Baraut, Baghpat and Khekra). In the present paper 35 exotic medicinal angiospermic plant species belonging to 24 families and

34 genera are described. 4.16% flora is exotic medicinal plant species in Baghpat district. 34.3% (12 out of 35 species) exotic medicinal plants came from America alone.

3135. **Topwal, M. & Uniyal, S. 2018.** "Review on important ethno-medicinal plants in Uttarakhand". *Int. J. Pure Appl. Biosci.* 6(2): 455–464.

Abstract: Ethno-botany has emerged as an important branch of study which focuses on the utility of different plant species and their values as food, medicine, etc. Uttarakhand state is considered as a repository of biodiversity with particular reference to medicinal plants that can be an important option for sustainable livelihood of the hilly people in coming future. About 300 medicinal plant species have been documented from this state, indicating ethno-medicinal richness as an herbal state and for strengthening herbal-based industry in this region. The potential drug value lies in plant roots, leaves, fruits, seeds and sometimes entire plant is used to cure the various ailments. These are administered in the form of infusion or decoction or applied locally as paste or powder to the affected body part to cure. The present paper focuses about the different medicinal plants used in the Uttarakhand Himalayan region.

3136. **Tripathi, S.C. & Srivastava, M. 2010.** "Ethnomedicinal flora of Euphorbiaceae used in dermatological problems". *Indin J. Tradit. Knowl.* 9(2): 318–320.

Abstract: Euphorbiaceae, the spurge family is a significant family of angiosperms is cosmopolitan in distribution. The communication deals with ethnomedicinal significance of few plants of family Euphorbiaceae growing frequently in district Bahraich. District is endowed with diverse flora of medicinal plants. In the ethnobotanical field survey, 7 genera with 11 species, which are used in care and cure of different dermatological problems were collected. The botanical name, local name, parts utilized and mode of treatment by traditional methods have been included.

3137. **Trivedi, V.J., Sati, J., Attri, D.C. & Nautiyal, M.C. 2017.** "Antioxidant potential of herbal tea from *Rhododendron anthopogon* D. Don and *Hippophae salicifolia* D. Don". *J. Non-Timber Forest Prod.* 24(3): 131–135.

Abstract: Herbal tea prepared from leaves and flowers of *Rhododendron anthopogon* D. Don. and from leaves and pulp of dried fruits *Hippophae salicifolia* D. Don was tested for its antioxidant potential. Both tested plant species were proven good candidates for commercial herbal teas in terms of antioxidant potentials.

3138. **Uniyal, B. & Shiva, V. 2005.** "Traditional knowledge on medicinal plants among rural women of the Garhwal Himalaya, Uttaranchal". *Indin J. Tradit. Knowl.* 4(3): 259–266.

Abstract: The present paper deals with traditional knowledge of medicinal plants among rural women of Garhwal. Seventy women of 11 villages were interviewed on the basis of their traditional knowledge on the various uses of medicinal plants found in the adjoining forest and agricultural areas. A total of 113 medicinal plant species were recorded during the intensive surveys and discussions held with the rural women.

3139. **Uniyal, M.R. 1964.** "Medicinal plants collected from Bhilangna valley during 1963-1964". *Sachitra Ayurveda* 17: 365–368.

3140. **Uniyal, M.R. 1968.** "Medicinal plants of the Bhagirathi valley lying in the Uttarkashi Forest Division of Uttar Pradesh". *Indian Forester* 94(5): 407–413.

Abstract: During a preliminary survey of Bhagirathi valley in the Himalayas, sixty-one medicinal plants belonging to thirty-seven families were collected and the same have been listed and described here. They are either commercially or traditionally important in medicine. The information accompanying each drug plant of the list based on field data collected from local drug collectors, drug markets and Vaidyas with especial reference to the parts used, localities from where they are collected, local and Sanskrit names and the use made of them especially in folk medicine.

3141. **Uniyal, M.R. 1989.** *Medicinal Flora of Garhwal Himalaya.* Sri BaidyanathAyurved Bhawan Pvt. Ltd., Nagar.

3142. **Uniyal, M.R. & Issar, R.K. 1967.** "Commercially important plants of Kanatal forest, Tehri-Garhwal". *Indian Forester* 93(2): 107–114.

Abstract: A systematic survey of 15 commercially important medicinal plants of Kanatal forest in Tehri-garhwal was conducted during the year 1963-64. Data was collected relating to their general description, trade/Indian name, distribution, time and method of collection, availability, part or parts used as crude drugs, local folklore, their exploitation on commercial lines and market studies.

3143. **Uniyal, M.R. & Joshi, G.C. 1986.** "Traditionally used family planning drug 'Babila Ghass' from Garhwal Himalaya". *Sachitra Ayurveda* (October): 198–400.

3144. **Uniyal, M.R. & Joshi, G.C. 1989.** "Traditionally used family planning drug 'Babila Chos' from Garhwal Himalaya". *Sachitra Ayurveda* 42(8): 239–240.

3145. **Uniyal, S.K., Awasthi, A. & Rawat, G.S. 2002a.** "Current status and distribution of commericially exploited medicinal plants in Upper Gori Valley, Kumaun Himalaya, Uttaranchal". *Curr. Sci.* 82: 1246–1252.

Abstract: Estimation of population status and biomass availability of 14 threatened medicinal and aromatic plant species (TMAPS) extracted and traded from the higher altitudes of Kumaon Himalaya was carried out. We used stratified random samples covering distinct landscape units or habitats. These TMAPS were distributed in nine different habitat types and had habitat-specific distribution. On the basis of their status and level of pressure at a local scale, we have grouped them into six categories and a conservation approach has been suggested.

3146. **Uniyal, S.K., Awasthi, A. & Rawat, G.S. 2002b.** "Traditional and ethnobotanical uses of plants in Bhagirathi valley (Western Himalaya)". *Indian J. Tradit. Knowl.* 1(1): 7–19.

Abstract: The local inhabitants in the upper catchment of river Bhagirathi, Garhwal Himalaya have inherited a rich traditional knowledge on the use of wild plants. This knowledge appears to be eroding gradually owing to rapid changes in socio-economics and lifestyle. The traditional knowledge of local people on the use of wild plants in their social, cultural and economic milieu has been studied and documented. Local people had information on uses of 211 wild plant species, which is discussed here.

3147. **Upadhyay, R. & Singh, J. 2005.** "Ethno-medicinal uses of plants from Tikri forest of Gonda district (U.P.)". *Ethnobotany* 17: 167–170.

Abstract: This communication deals with ethno-medicinal uses of 30 plant species belonging to 19 families, collected from Tirki forest of Gonda district, U.P. These plants are frequently used for treatment of various diseases by Bhars and rural inhabitants living near the forest area.

3148. **Upadhyay, R. & Singh, J. 2007.** "Ethno-medicinal plants of Tikri forests in Gonda districts of Uttar Pradesh". *J. Non-Timber Forest Prod.* 14(2): 147–153.

Abstract: This paper presents the ethnomedicinal uses of plant species found in the Tikri forest of Gonda District. The tribal peoples of 'Bhar' community reside in the remote village of the forest. 'Bhar' community possessed the knowledge of 67 medicinal uses derived from 33 plants species belonging to 22 families to treat a wide range of ailments. Besides raw usage, maximum infusion and juicy form of medicines were administered mostly orally or externally. Roots and leaves were the most frequent used plant parts. The present study indicates some interesting and reliable uses of plants as medicinal and there is lack of phyto-therepeutic evidence of many of the species, so, phytochemical and pharmacological studies should be carried out in order to confirm the validity of properties attributed to these species.

3149. **Upadhyaya, P.S. 1989.** "Ethnomedicinal uses of some plants by the Tharus of Bahraich district, U.P.". *Mendel* 6(1): 143–145.

3150. **Upreti, D.K. & Negi, H.R. 1996.** "Folk use of *Thamnolia vermicularis* (Swartz) Ach. in Lata village of Nanda Devi Biosphere Reserve". *Ethnobotany* 8: 92–95.

Abstract: The paper deals with vermicidal use of *Thamnolia vermicularis* (Swartz) Ach. by Bhotia tribes in Lata village of Nanda Devi Biosphere Reserve.

3151. **Upreti, K., Jalal, J.S., Tewari, L.M., Joshi, G.C., Pangtey, Y.P.S. & Tiwari, G. 2009.** "Ethnomedicinal uses of pteridophytes of Kumaun Himalaya, Uttarakhand, India". *J. American Sci.* 5(4): 167–170.

Abstract: The present study deals with the ethnomedicinal uses of pteridophytes in the treatments of various diseases. The pteridophytes are widely used by the local people of the Kumaun Himalaya. The present study documents ethnomedicinal uses of 30 Pteridophytes plants, which are prevalent in study area along with botanical name, family, plant parts and mode of ethnomedicinal use.

3152. **Vakshasya, S. & Dikshit, G. 2011.** "Plants used in contact therapy by Van Gujjars and other indigenous people of Khatima tarai region of district Udhamsingh Nagar of Uttarakhand state". *J. Econ. Taxon. Bot.* 35(2): 407–411.

Abstract: Plants used by Van Gujjar and other indigenous people in contact therapy have been recorded in the present manuscript. Though contact therapy is not very common therapy among civilised world but it is an age old and effective treatment practice to cure several human and veterinary ailments in the tribals and other indigenous persons of the study area. It has been noticed that plant parts specially roots and stem are used more vigorously in comparison to other plant parts. Sometimes they also allow inhaling the floral fragrance for prompt relief. It is believed to be totally save treatment therapy and causes no harms either in prevention and/or cure

of the ailment as these are based on local application. For the present study, different tribal inhabiting sites were surveyed and ethnomedicinal descriptions of about 30 angiospermic plant species were recorded.

3153. **Vakshasya, S. & Dikshit, G. 2018.** "Usage of flowers as ethnomedicines by ethnic people of Indo-Nepal sub Himalayan border region of Pilibhit Tiger Reserve (PTR), India". *Ethnobotany* 30: 49–52.

Abstract: In the present paper, an effort has been made to study usage of different flowers as ethno-medicines by people, living in and around forests of Pilibhit Tiger Reserve. During the ethnobotanical surveys of more than 30 tribal inhabiting localities and villages of the study area, 20 plant species of 17 angiosperm families were documented, the flowers of which were used for curing more than 28 human ailments. Most of these ethno-medicinal uses are very interesting and new to the ethnobotanical science.

3154. **Verma, A.K., Kumar, M. & Bussmann, R.W. 2007.** "Medicinal plants in an urban environment: the medicinal flora of Banares Hindu University, Varanasi, Uttar Pradesh". *J. Ethnobiol. & Ethnomed.* 3: Article 35. (doi: 10.1186/1746-4269-3-35).

Abstract: Varanasi is one of the oldest continuously inhabited cities of the world, and one of the most important Hindu pilgrimage sites. Despite this importance, very little information exits on the cities flora in general, and medicinal species found within its limit in particular. Traditional medicine plays a large role in Indian society. The presented study attempted to investigate if traditional plant use and availability of important common medicinal plants are maintained in urban environments. The paper presents information on the traditional uses of seventy-two plant species collected form the campus of Banares Hindu University, Varanasi, Uttar Pradesh, and highlights the uses of these plants by the local inhabitants.

3155. **Verma, R.K., Kumar, V. & Agarwal, R.K. 2008.** "Ethno-medicinal value of some plant species used by Sahariya tribe of Lalitpur district, Bundelkhand region". *Ann. Forest.* 16(1): 99–111.

Abstract: The importance of medicinal plants in traditional health care practices, providing clues to new areas of research and in biodiversity conservation is now well recognised. However, information on the uses of plants for medicine is lacking from interior areas of Bundelkhand region. Keeping this in view the present study was initiated in 'Sahariya' dominated villages of district lalitpur. The study aimed to look into the diversity of plant resources that are used by Sahariya tribe for curing various ailments. Questionnaire surveys, participatory observations and field visits were planned to elicit information on the uses of various plants. Information collected has revealed 29 plant species that are used for treatment of various day-to-day diseases. Among them there were 16 trees, 7 shrubs, 5 herbs and 1 climber. All these plant species were dicot and belongs to 23 angiospermic families. More or less, a single species was used to cure more tha one disease but comparatively less number of plant species were used to cure only a single disease. Leaves and roots were reported to be the most frequently used parts of plants for treatment of various ailments. It is suggested that for the traditional ecological knowledge pertaining to medicinal plant

utilization needs for exploration and warrants recognition of an incentive based community conservation of medicinal plants.

3156. **Yadav R.B. & Verma, S.K. 2010.** "Studies on ethnomedicinal plants of Ranipur Wild Life Sanctuary, U.P.". *Int. J. Pl. Sci.* 5(1): 40–42.

Abstract: A study on ethno-medicinal plants was conducted in various locality of Ranipur Wild Life Sanctuary of Uttar Pradesh. This study included 20 plants species from 16 families which have ethno-medicinal potential. Out of these 20 plants there were 8 trees, 3 shrubs, 6 herbs and 3 climbers. These plants materials were also collected for preparation of herbaria and authentic indentification.

3157. **Yadav R.B., Singh, Lal Ji, Verma, S.K. & Kumar, Ajay. 2014.** "Medicinal Plants of Auraiya district, Uttar Pradesh, India: Their uses and conservation status". *Geophytology* 44(1): 55–62.

3158. **Yadav, R.K. & Prakash, A. 2014.** "Aromatic medicinal plant resources in Uttar Pradesh, India". *Med. Aromat. Pl.* 3: 160. (doi: 10.4172/2167-0412.1000160).

Abstract: A study on the native uses of ethnomedicinal species was carried out in the Lakhimpur-kheri district of Uttar Pradesh state in India with the major objective of identifying different medicinal plant species. Production and productivity of many wild-type plants have increase manifolds but the challenges of malnutrition and threat of climate change continues by the time. The ethnobotanical data were collected through questioners by interviewing local communities and Hakims. The medicinal practitioners were treating the common diseases like cough cold, snake bite, diabetes, wounds, fever, toothache and the antitumor activity. In total 21 species belonging to 18 genera and 15 families were recorded which were used by inhabitants of the area.

ABBREVIATION OF JOURNALS

The titles of journals have been standarised following Botanico-Periodicum-Huntianum (Lawrence & al., 1968), B-P-H/Supplementum (Bridson & Smith, 1991) and BPH2: Periodicals with Botanical Content (Bridson, 2004). The journals which are not in BPH and its Supplements have been abbreviated as suggested in the journals, or as per the rules of B-P-H.

Acad. J. Med. Pl.	:	Academia Journal of Medicinal Plants
Acta Bot.	:	Acta Botanica
Acta Bot. Ind.	:	Acta Botanica Indica
Advance Forest. Res. India	:	Advance Forestry Research in India
Advance Pl. Sci. Res. India	:	Advance Plant Science Research India
Advanced Biol. Res.	:	Advanced Biological Research
Advanced Res. J. Pl. & Animal Sci.	:	Advanced Research Journal of Plant & Animal Science
African J. Pl. Sci.	:	African Journal of Plant Science
African J. Tradit. Compl. & Alternative Med.	:	African Journal of Traditional, Complementary and Alternative Medicines
Agra Univ. J. Res. (Sci.)	:	Agra University Journal of Research (Science)
Agroforestry for Rural Development	:	Agroforestry for Rural Development
Allahabad Univ. Stud.	:	Allahabad University Studies
American Fern J.	:	American Fern Journal
American J. Climate Change	:	American Journal of Climate Change
American J. Pl. Sci.	:	American Journal of Plant Science
American J Pharm. & Health Res.	:	American Journal of Pharmacy & Health Research
Ancient Sci. Life	:	Ancient Science Life
Ann. Forest.	:	Annals of Forestry
Ann. Phytomed.	:	Annals of Phytomedicine
Ann. Pl. Sci.	:	Annals of Plant Science
Ann. Roy. Bot. Gard. Calcutta	:	Annals of Royal Botanic Garden Calcutta
Appl. Ecol. & Environm. Sci.	:	Applied Ecological & Environmental Science
Archives Agric. & Environm. Sci.	:	Archives of Agriculture and Environmental Science
Arct. & Alp. Res.	:	Arctic and Alpine Research
Aryavaidyan	:	Aryavaidyan
Asian Agri-Hist.	:	Asian Agri-History
Asian Australasian J. Pl. Sci. & Biotech.	:	Asian-Australasian Journal of Bioscience and Biotechnology
Asian J. Pharmacy & Life Sci.	:	Asian Journal of Pharmacy & Life Science
Asiat. Res.	:	Asiatic Research
Australian J. Medical Herbalism	:	Australian Journal of Medical Herbalism
Bangladesh J. Bot.	:	Bangladesh Journal of Botany
Bangladesh J. Forest Sci.	:	Bangladesh Journal of Forest Science
Bangladesh J. Pl. Taxon.	:	Bangladesh Journal of Plant Taxonomy
Biblioth. Phycol.	:	Bibliotheca Phycologica
Biblioth. Pteridologica	:	Bibliotheca Pteridologica

Bio Bull.	:	Bio Bulletin
Biodiversitas	:	Biodiversitas
Biodiv. & Conserv.	:	Biodiversity and Conservation
Biodiv. Res. & Conserv.	:	Biodiversity: Research and Conservation
Biogeographica	:	Biogeographica
Biolife	:	Biolife
Biol. Conserv.	:	Biological Conservation
Bionature	:	Bionature
Bot. Progress	:	Botanical Progress
Bot. Rev.	:	The Botanical Review
Brittonia	:	Brittonia
BSI ENVIS Newsletter	:	BSI ENVIS Newsletter
Bryologist	:	Bryologist
Bull. Bot. Soc. Bengal	:	Bulletin of the Botanical Society of Bengal
Bull. Bot. Surv. India	:	Bulletin of the Botanical Survey of India (Vol. 1–50, 1959–2009. Superseded by: Nelumbo)
Bull. Brit. Mus. Nat. Hist.	:	Bulletin of British Museum of Natural Histtory
Bull. Environm. Pharmacol. & Life Sci.	:	Bulletin of Environment, Pharmacology & Life Science
Bull. Med.-Ethno-Bot. Res.	:	Bulletin of Medico-Ethno-Botanical Research
Bull. Pure Appl. Sci.	:	Bulletin of Pure Applied Science
Candollea	:	Candollea
Check List	:	Check List
Cheetal	:	Cheetal
Conserv. Biol.	:	Conservation Biology
Conserv. & Soc.	:	Conservation & Society
Cryptogams Biodiversity & Assessment	:	Cryptogams Biodiversity & Assessment
Curr. Bot.	:	Current Botany
Curr. J. Appl. Sci. & Technol.	:	Current Journal of Applied Science & Technology
Curr. Res. Environm. & Appl. Mycol.	:	Current Research in Environmental & Applied Mycology
Curr. Sci.	:	Current Science
Curr. World Environm.	:	Current World Environment
E-Int. Scientific Res. J.	:	E-International Scientific Research Journal
eJ. Appl. Forest Ecol.	:	eJournal of Applied Forest Ecology
Eastern Anthropologist	:	The Eastern Anthropologist
Ecol. Environm. & Conserv.	:	Ecology, Environment and Conservation
Econ. Bot.	:	Economic Botany
Edinburgh J. Bot.	:	Edinburgh Journal of Botany
Energy Policy	:	Energy Policy
Environm. Conserv.	:	Environmental Conservation
Environm., Develop. & Sustain.	:	Environment, Development & Sustainability
Environm. & Ecol.	:	Environment & Ecology
Environm. India	:	Environment India

Environm. New Challenges	:	Environment New Challenges
Environm. Manage.	:	Environmental Management
Environmentalist	:	The Environmentalist
ENVIS Bull. Himal. Ecol. & Develop.	:	ENVIS Bulletin of Himalayan Ecology & Development
ENVIS Forest. Bull. (Medicinal Plants Special)	:	ENVIS Forestry Bulletin- Medicinal plants special
ENVIS Newsletter Himal. Ecol.	:	ENVIS Newsletter on Himalayan Ecology
Ethnobotany	:	Ethnobotany
Ethnobotany Res. & Applications	:	Ethnobotany Research and Applications
Ethnobot. Leafl.	:	Ethnobotanical Leaflet
Ethnobot. Res. & Applications	:	Ethnobotany Research & Applications
EurAsian J. Biosci.	:	EurAsian Journal of Bioscience
European J. Med. Pl.	:	European Journal of Medicinal Plant
Evidence-Based Complementary and Alternative Med.	:	Evidence-Based Complementary and Alternative Medicine
FAO/IBPGR Pl. Genet. Resources Newsletter	:	FAO/IBPGR Plant Genetic Resources Newsletter
Feddes Repert.	:	Feddes Repertorium
Fern Gaz.	:	The Fern Gazette
Financ. Agric.	:	Financial Agriculture
Fitoterapia	:	Fitoterapia
Flavour Industry	:	Flavour Industry
Fl. & Fauna	:	Flora and Fauna
Folio Geobotanica	:	Folio Geobotanica
Folklore	:	Folklore
Forest Ecol. & Manage.	:	Forest Ecology & Management
Forest Sci. & Technol.	:	Forest Science and Technology
Forest Studies China	:	Forest Studies in China
Forest Trees and Livelihood	:	Forest Trees and Livelihood
Forest. Stud. China	:	Forestry Studies in China
Genet. Resource & Crop Evol.	:	Genetic Resources and Crop Evolution
Geobios	:	Geobios, Jodhpur
Geobios, New Rep.	:	Geobios, New Reports
Geophytology	:	Geophytology
Global J. Res. Med. Pl. & Indigenous Med.	:	Global Journal of Research on Medicinal plants and Indigenous Medicine
Hima-Paryavaran Newsletter	:	Hima-Paryavaran Newsletter
Himalaya	:	Himalaya
Himal. Biosphere Reserve	:	Himalayan Biosphere Reserve
Himal. Chem. & Pharmaceut. Bull.	:	Himalayan Chemical and Pharmaceutical Bulletin
Himal. J.	:	Himalayan Journal
Himal. J. Sci.	:	Himalayan Journal of Science
Himal. Res. Develop.	:	Himalayan Research Development
Imperial J. Interdisciplinary Res.	:	Imperial Journal of Interdisciplinary Research

Indian Drugs	:	Indian Drugs
Indian Drug Pharmaceut. Indust.	:	Indian Drug Pharmaceutical Industry
Indian Fern J.	:	The Indian Fern Journal
Indian Forest Rec. (Bot.)	:	Indian Forest Record (Botany)
Indian Forest Res. (N.S.) Bot.	:	Indian Forest Research (N.S.) Botany
Indian Forester	:	The Indian Forester
Indian Hort.	:	Indian Horticulture
Indian J. Agroforest.	:	Indian Journal of Agroforestry
Indian J. Appl. & Pure Biol.	:	Indian Journal of Applied & Pure Biology
Indian J. Curr. Sci.	:	Indian Journal of Current Science
Indian J. Ecol. & Environm. Sci.	:	Indian Journal of Ecology and Environmental Science
Indian J. Forest.	:	Indian Journal of Forestry
Indian J. Forest., Addl. Ser.	:	Indian Journal of Forestry, Additional Series
Indian J. Fundamental & Appl. Life Sci.	:	Indian Journal of Fundamental and Applied Life Sciences
Indian J. Human Ecol.	:	Indian Journal of Human Ecology
Indian J. Mycol. & Pl. Pathol.	:	Indian Journal of Mycology & Plant Pathology
Indian J. Nat. Prod. & Resources	:	Indian Journal of Natural Products & Resources
Indian J. Pharmaceut. & Biol. Res.	:	Indian Journal of Pharmaceutical and Biological Research
Indian J. Phys. Nat. Sci.	:	Indian J. Phys. Nat. Sci.
Indian J. Pl. Genet. Resour.	:	The Indian Journal of Plant Genetic Resources
Indian J. Pl. Sci.	:	Indian Journal of Plant Sciences
Indian J. Sci. & Technol.	:	Indian Journal of Science & Technology
Indian J. Scientif. Res.	:	Indian Journal of Scientific Research
Indian J. Scientific Res. & Technol.	:	Indian Journal of Scientific Research and Technology
Indian J. Tradit. Knowl.	:	Indian Journal of Traditional Knowledge
Indian J. Trop. Biodiv.	:	Indian Journal of Tropical Biodiversity
Indian J. Weed Sci.	:	Indian Journal of Weed Science
Indian Perfumer	:	Indian Perfumer
Indian Phytopathol.	:	Indian Phytopathology
Indigenous Knowl. & Develop. Monitor.	:	Indigenous Knowledge and Development Monitor
Integrative Med. Res.	:	Integrative Medicine Research
Int. Forest. Rev.	:	International Forestry Review
Int. J. Advanced Life Sci.	:	International Journal of Advanced Life Sciences
Int. J. Adv. Pharm. Biol. & Chem.	:	International Journal of Advances in Pharmacy, Biology and Chemistry
Int. J. Advanced Res.	:	International Journal of Advanced Research
Int. J. Advanced Res. Engineering & Appl. Sci.	:	International Journal of Advanced Research in Engineering and Applied Sciences
Int. J. Advanced Scientif. Res. & Manage.	:	International Journal of Advanced Scientific Research & Management

Int. J. Agric. & Biol.	:	International Journal of Agriculture & Biology
Int. J. Appl. Earth Observ. & Geoinf.	:	The International Journal of Applied Earth Observation and Geoinformation
Int. J. Appl. Pure Sci. & Agric.	:	International Journal of Applied and Pure Science and Agriculture
Int. J. Ayurvedic & Herbal Med.	:	International Journal of Ayurvedic & Herbal Medicine
Int. J. Bioassays	:	International Journal of Bioassays
Int. J. Biodiv.	:	International Journal of Biodiversity
Int. J. Biodiv. & Conserv.	:	International Journal of Biodiversity and Conservation
Int. J. Biodiv. Sci. & Manage.	:	International Journal of Biodiversity Science & Management
Int. J. Biodiv. Sci., Ecosyst. Serv. & Manage.	:	International Journal of Biodiversity Science, Ecosystem Services & Management
Int. J. Bioinformatics & Biomed. Engineering	:	International Journal of Bioinformatics & Biomedical Engineering
Int. J. Biol. Technol.	:	International Journal of Biological Technology
Int. J. Biometeorol.	:	International Journal of Biometeorology
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Kandari, O.P. (428)
Kandpal, M.M. (670, 1443, 1444, 2770)
Kandpal, V. (1253, 2275)
Kandwal, M.K. (429, 430, 431, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862)
Kanjilal, P.C. (432, 433)
Kanjilal, U. (434, 435)
Kanodia, K.C. (436)
Kanoujia, O.P. (597)
Kant, R. (132, 1358, 1863, 2615, 2616)
Kanta, C. (2483, 2596, 2944)
Kanwal, K.S. (2597, 2740)
Kapil, R. (437)
Kapkoti, B. (1)
Kapoor, L.D. (1864, 2598, 2934)
Kapoor, S.L. (438, 439, 1750, 1807, 1864, 1865, 2598)
Kapur, S.K. (440)
Kar, R. (441, 2599)
Karunakaran, P.Y. (377)
Kasana, M.S. (2827)
Kaur, J. (241, 377, 1866, 1867, 1868, 1894, 1972, 2883)
Kaur, M. (442)
Kaur, R. (2600)
Kaur, S. (1519, 1531, 1869, 1870)
Kaur, U. (443)
Kazmi, S. (1376, 1377)
Kazmi, S.M.A. (1871)
Kenoyer, L.A. (227, 444)
Kewat, A.K. (1718, 2222)
Khadda, B.S. (2601)
Khair, S. (1898)
Khajuria, A.K. (2602)
Khali, M. (445)
Khali, M.P. (2666)
Khalid, M.A. (945)
Khan, A. (88, 449, 450, 1872)
Khan, A.A. (446, 447, 448, 449, 450, 1872, 2603, 2604)
Khan, A.H. (451, 2366, 2369)
Khan, A.M. (3075)
Khan, A.V. (2603, 2604)
Khan, J.A. (193)
Khan, M.A. (3080, 3081, 3082)
Khan, M.R. (452)
Khan, S. (2605)
Khan, S.A. (452)
Khan, Z.H. (28, 1730, 1731)
Khanduri, A. (453, 454)
Khanduri, V.P. (303, 954, 1027, 1146, 2525)
Khanna, K.K. (455, 457, 458, 459, 460, 461, 1185, 1873, 1874, 1875, 1933, 2276, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2965, 3089)
Khanna, P. (735)
Khanna, R.K. (794, 3042)
Khanuja, S.P.S. (1085)
Khare, A.K. (490)
Khare, N. (2353)
Khare, P.B. (1353, 1603)
Khare, P.K. (947, 1354)
Khare, R. (1355, 1356, 1357)
Kharkwal, G. (462, 463, 2595)

Kharkwal, H.B. (2689)
Kharkwal, K. (1358, 1863, 2615, 2616)
Khatoon, S. (3015, 3048)
Khera, N. (464)
Kholia, B. (1372)
Kholia, B.S. (465, 466, 1242, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1380, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1530, 1790)
Khoshoo, T.N. (467, 468)
Khulbe, R.D. (1367, 1368, 1369, 1554, 1634)
Khullar, S.P. (1370, 1371, 1372, 1373, 1374, 1636)
Kljuykov, E.V. (726, 727, 728, 729)
Kimothi, G.P. (2617)
Kimothi, M.M. (886)
Kimothi, P. (744)
King, G. (469)
Kinhal, G.A. (2330)
Kishor, K. (683, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1996, 2231, 2280)
Kohli, G. (161)
Kohli, R.K. (221)
Koppar, M.N. (1980)
Koranga, S.S. (2758)
Kothari, M.J. (1805)
Kothyari, B.P. (395, 2477)
Kotia, A. (470, 1825)
Krishna, A. (1026)
Krishna, G. (1152)
Kukreti, M. (135, 510)
Kukreti, P. (2051, 2052, 2053)
Kukreti, S. (1567)
Kukreti, U.D. (785, 1145)
Kukshal, S. (471)
Kulkarni, A.R. (472)
Kulshreshtha, K. (764)
Kumar, A. (222, 452, 464, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 563, 570, 797, 952, 1142, 1244, 1375, 1376, 1377, 1584, 1619, 1873, 1884, 1885, 1886, 1887, 1888, 2063, 2157, 2247, 2277, 2295, 2297, 2398, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2654)
Kumar, Ajay (3157)
Kumar, Anil (110)
Kumar, A.B. (491)
Kumar, B. (484, 1076, 1134, 1219, 1343, 1344, 1345, 1346, 1347, 1378, 1379, 1380, 1428, 1445, 2181, 2378, 2379, 2625, 2626)
Kumar, D. (528, 529, 2701, 2827)
Kumar, G. (2602)
Kumar, H. (2456)
Kumar, K. (2903, 3022)
Kumar, L. (172, 2712)
Kumar, M. (106, 107, 114, 213, 485, 486, 962, 2278, 2407, 2408, 2627, 2885, 2988, 3154)
Kumar, M.S. (2628)
Kumar, N. (487, 1003, 2461, 2557, 2861)
Kumar, O. (1135)
Kumar, P. (371, 372, 373, 374, 376, 488, 875, 1118, 1146, 1815, 1825, 1826, 1827, 1828, 1829, 1889, 1890, 1891, 2060, 2064, 2263, 2264, 2537, 2629, 2630)
Kumar, R. (489, 490, 491, 507, 1345, 2231, 2233, 2246, 2279, 2280, 2411, 2412, 2608, 2631, 2632, 2633, 2634, 2635)
Kumar, S. (79, 80, 241, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 598, 1003, 1026, 1042, 1232, 1354, 1381, 1382, 1537, 1611, 1621, 1749, 1868, 1891, 1892, 1893, 1894, 1968, 1972, 2636, 2637, 2638, 2639, 2640, 2641, 2852, 2855, 2883, 3013, 3088)
Kumar, Sanjay (2344)
Kumar, V. (678, 1895, 1896, 2326, 2618, 2958, 3054, 3098, 3155)
Kumari, A. (1383)
Kumari, B. (489, 503, 504, 505, 506, 507, 784, 1021, 1022, 1023, 1101, 1102, 1103, 1897, 2633, 2634, 3063, 3065)
Kumari, D. (538, 1384)
Kumari, P. (508, 1385, 2642, 2643, 2644)

Kumari, R. (2645)
Kumari, T. (2379, 2941)
Kuniyal, C.P. (93, 94, 136, 2443, 2646)
Kuniyal, P.C. (2646)
Kunwar, R.M. (2979)
Kushwaha, A.K. (67, 68, 509, 2647)
Kushwaha, S.P.S. (1045)
Kwon-Ndung, E.H. (1002)
Lakhanpal, T.N. (1244)
Lakshminarasimhan, P. (1076, 2047, 2054)
Lal, A. (2812)
Lal, B. (1218, 2463, 2464, 2648, 2649, 3008, 3037)
Lal, C. (293, 510)
Lal, J. (1898, 2277)
Lal, P. (519)
Lambert, W.J. (148)
Lata, H. (93, 94)
Lata, K. (488, 599, 600, 1899, 1900, 1971, 2650, 2717)
Lata, S. (2651, 2652, 2653)
Lavania, V.K. (2624)
Lawkush (1896, 1901)
Laxmi, V. (149)

Lepcha, S.T.S. (586, 2654)
Ling, Y.R. (511)
Liu, J.Q. (2228)
Lodhiyal, L.S. (1)
Lodhiyal, N. (1)
Lohani, N. (2280)
Luna, R.K. (512)
Magesh, C.R. (1732)
Mahapatra, K.K. (945)
Mahapatra, S. (1902)
Maheshwari, J.K. (513, 1055, 1056, 1057, 1064, 2281, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 3005, 3006, 3023, 3024, 3025, 3026, 3027, 3028, 3039, 3040, 3041)
Mahra, G.S. (299)
Maikhuri, R. (2731)
Maikhuri, R.K. (422, 514, 515, 516, 517, 626, 656, 745, 810, 811, 2594, 2595, 2666, 2667, 2668, 2669, 2670, 2671, 2705, 2725, 2726, 2727, 2728, 2752, 2753, 2754, 2823, 2824, 2825, 2844, 2866, 3079)
Maithani, G.P. (518, 519, 520, 521)
Maiti, G.G. (1903, 1904, 1905)
Maity, D. (522)
Majila, B.S. (2485)
Majumdar, A. (523)
Maletha, A. (2753)
Malhotra, B.N. (1622)
Malhotra, C.L. (119, 120, 121, 524, 1182, 1671, 1689, 1690, 1694, 1786, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 2209, 2211, 2672, 2673)
Malhotra, S.K. (525, 526)
Malick, K.C. (1977)
Malik, S.A. (974)
Malik, V. (527, 528, 529, 1925, 1938, 2674, 2706, 2707)
Malik, Z.A. (530, 531, 2675)
Maliya, S.D. (532, 533, 534, 535, 536, 537, 2282, 2676, 2677, 2678, 2679, 2680, 2681, 2682, 2683, 2684, 2685)
Mamgain, A. (2914)
Mamgain, S.K. (1926, 1927, 2283, 2686)
Mangal, A.K. (2624)
Manhas, R.K. (174, 177, 178, 287, 431, 538, 1174, 2876, 3045)
Mani, R.J. (2452)
Manikandan, R. (158, 539, 540, 541, 1347, 1928, 2284, 2285, 2687)
Manjkhola, S. (127, 212, 2469)
Manoharachary, C. (1240)
Manral, H.S. (647)
Manral, K. (720)
Manral, U. (542)
Mao, A.A. (1749)
Marten, J. (1386)
Martolia, A. (1508, 1537)
Martolia, G.S. (1489, 1490, 1491)
Mathela, C.S. (2688, 2689, 2690)
Mathela, D.K. (2690)
Mathur, A. (543, 544, 545, 546, 2286, 2287, 2691, 2692, 2693, 2694, 2695, 2696, 2697)
Mathur, H.N. (547)
Mathur, P.N. (1387)
Mathur, V.B. (1036)
Maulik, M. (1929)
Maurya, A.K. (2653)
Mehmood, T. (1246, 1388)
Mehra, G. (1253)
Mehrotra, B.N. (48, 49, 548, 549, 1676, 1677, 1796, 1930, 1931, 1932, 2017, 2133, 2698)
Mehrotra, P. (463)
Mehrotra, R.K. (1396)
Mehta, I.S. (2699, 2892)
Mehta, J.P. (97, 99)
Mehta, P.S. (646, 2328, 2700, 2701, 2702, 2703, 2704, 2743, 2750, 2758)
Melkani, A.B. (2690)
Melkania, N.P. (550, 551, 552, 553, 554)
Mishra, A. (555)
Mishra, A.K. (743, 1892)
Mishra, D. (1389, 1390, 1565, 2708)
Mishra, G.K. (1391)
Mishra, L. (555)
Mishra, P.N. (556, 3080)
Mishra, R.K. (2397, 2398)
Mishra, S. (557, 558, 601, 1889, 1890, 1900, 1933, 1969)
Mishra, U.S. (1392)
Misra, B.K. (268, 559, 560, 1203, 1204, 1934, 1935, 1936, 2220)
Misra, O.P. (561, 702, 1937)
Misra, P.K. (1273, 1274, 1275, 1393, 1394, 1395, 1396, 1397, 1398)
Misra, S. (2705)
Misra, V.K. (562)
Mitra, K. (1046)
Mitra, M. (474, 480, 481, 482, 563, 1888, 2622)
Mitra, R. (2598)
Mittal, R.K. (564)
Mittal, S. (1399)
Mohammad, I. (528, 529, 1925, 1938, 2674, 2706, 2707)

Mohan, D. (483, 542, 565)
Mohan, D.D. (945)
Mohan, J. (1233)
Mohan, N. (1233)
Mohommad, S. (566)
Mondal, M.S. (1902)
Monika (2708)
Mudaiya, R.K. (2288, 2547, 2802)
Mudgal, V. (461, 1043, 1044, 2609, 2610, 2611, 2612, 2613, 2614, 2965, 3089)
Mukerji, S.N. (1573)
Mukherjee, A. (2709)
Mukherjee, P.K. (1939)
Mukherjee, S.K. (2272)
Muneem, K.C. (645, 647, 1978, 1982, 2744, 2747)
Mungali, K. (567)
Munro, W. (568)
Murgassan, J. (2204)
Murthy, K.R.K. (569, 1895)
Murti, S.K. (964, 1581, 1728, 1940, 1941, 1942, 1942a, 2084)
Murty, Y.S. (1798, 1943, 1944, 1945, 1946, 1975, 2177)
Murugan, C. (541)
Nadeem, M. (570)
Nagar, B. (2988)
Nagarwalla, D.J. (571)
Nageswara Rao, A. (1947)
Nagiyan, P. (2640, 2710)
Nailwal, T. (1537)
Nair, K.N. (2082)
Nair, N.C. (572, 1948)
Nair, V.J. (572)
Naithani, B.D. (573, 574, 575, 705, 1400, 1949, 1950)
Naithani, B.P. (2711)
Naithani, H.B. (64, 153, 201, 202, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 781, 891, 1037, 1401, 1686, 1757, 1758, 1759, 1760, 1761, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 2118, 2169, 2213)
Naithani, N. (1967)
Naithani, R. (2350)
Naithani, S. (1002)
Namrata (2712)
Nand, Ghana (37, 38, 39, 40, 1661, 1662, 2359)
Nandavani, D. (500)
Nandi, S.K. (160, 570, 2755)
Narain, P. (406)
Narain, S. (241, 488, 501, 557, 558, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 1077, 1078, 1097, 1866, 1867, 1868, 1889, 1890, 1894, 1899, 1900, 1968, 1969, 1970, 1971, 1972, 2165, 2636, 2713, 2714, 2715, 2716, 2717, 2718, 2794, 2883, 3017, 3018, 3019, 3066, 3067, 3068)
Narasimhan, D. (2260)
Narayan, J. (2319)
Nath, B. (1184)
Nath, D. (2719)
Nath, V. (1235, 1402, 1403, 1404, 1405, 1584)
Nautiyal, A. (2484)
Nautiyal, A.R. (2446, 2720, 2943)
Nautiyal, B.P. (45, 99, 136, 471, 608, 609, 610, 611, 616, 618, 619, 943, 1270, 2448, 2475, 2913)
Nautiyal, D. (2538)
Nautiyal, D.C. (98, 612, 1742, 1777, 1778, 1779, 1780, 1973, 1974, 2106, 2721)
Nautiyal, D.D. (613)
Nautiyal, D.P. (585)
Nautiyal, K.N. (1975)
Nautiyal, M. (614, 615, 858, 2108)
Nautiyal, M.C. (149, 516, 611, 616, 617, 618, 619, 881, 1025, 1270, 2448, 2475, 2666, 2720, 2979, 2981, 3137)
Nautiyal, P.C. (625)
Nautiyal, S. (276, 278, 487, 514, 517, 620, 621, 622, 623, 624, 625, 626, 634, 635, 745, 810, 811, 1358, 1976, 2503, 2616, 2667, 2668, 2669, 2670, 2722, 2723, 2724, 2725, 2726, 2727, 2728, 2731, 2844, 2866)
Nayak, K.S. (2729)
Nayaka, S. (1234, 1391, 1576, 1578, 1631)
Nayal, J.S. (2820)
Nayar, M.P. (1977, 2289)
Nayar, S.L. (2730)
Neetu (2343, 2345, 2346)
Negi, A.K. (106, 107, 312, 313, 358, 359, 360, 659, 660, 2240, 2760, 2761)
Negi, A.S. (245)
Negi, B.K. (627)
Negi, B.S. (510, 628)
Negi, C. (2731)
Negi, C.S. (629, 630, 631, 632, 633, 634, 635, 2290, 2732, 2733, 2734, 2735)
Negi, G.C.S. (62, 878, 879, 2421)
Negi, G.S. (636, 637, 638, 2404, 2479, 2486)
Negi, H.R. (1406, 1629, 1630, 3150)
Negi, J.D.S. (177, 178, 520, 521, 587, 671, 672, 673)
Negi, J.S. (2350, 2441, 2442, 2443)
Negi, K.S. (19, 279, 422, 639, 640, 641, 642, 643, 644, 645, 646, 647, 986, 1331, 1648, 1978, 1979,

1980, 1981, 1982, 2291, 2328, 2510, 2702, 2703, 2704, 2724, 2727, 2736, 2737, 2738, 2739, 2740, 2741, 2742, 2743, 2744, 2745, 2746, 2747, 2748, 2749, 2750, 2751, 2758)
Negi, M. (935, 2876)
Negi, P.S. (648, 649, 650, 651, 652, 653, 654)
Negi, R. (585)
Negi, S. (2751)
Negi, S.C. (3097)
Negi, S.P. (655)
Negi, S.S. (2751)
Negi, V. (113)
Negi, V.S. (157, 656, 2752, 2753, 2754, 2755)
Nehal A. (2884)
Nehta, P.S (131)
Nigam, B.K. (2649)
Nigam, G. (2756)
Nigam, R.K. (1267)
Nithya, S.P. (541)
Ojha, C.K. (1096)
Ojha, J.K. (2393)
Ojha, S.N. (646, 2702, 2704, 2757, 2758)
Osmaston, A.E. (657, 658)
Padalia, H. (2316)
Padalia, K. (2759)
Padhi, M.M. (2624)
Painuli, P. (1277, 1278)
Painuli, R.M. (100, 2312, 2487, 2512, 2513, 2945, 2946, 2947, 2948, 2949, 2950, 2952, 2953, 3037)
Pal, M. (141, 142, 578, 586, 2444, 2893)
Pal, R. (1861, 1862)
Pal, R.S. (2709)
Pala, N.A. (313, 358, 359, 360, 659, 660, 2760, 2761, 2939, 2988)
Palani, L.M.S. (570)
Pali, C.B. (885)
Paliwal, A. (1165)
Paliwal, A.K. (355, 661, 733, 2526)
Paliwal, G.S. (1164, 2292, 2762, 2763)
Paliwal, N.K. (662)
Palni, L.M.S. (160, 2293, 2313, 2476, 2477, 2884, 2894, 2895, 2897, 2898)
Palvi, S.K. (2916)
Pande P.C. (2007)
Pande, B.J. (2764)
Pande, D. (2991)
Pande, G. (2765, 3101)
Pande, H.C. (162, 194, 663, 1339, 1341, 1342, 1343, 1345, 1346, 1378, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1459, 1460, 1461, 1462, 1463, 1585, 1587, 1983, 2766, 2772, 2774, 2775)
Pande, N. (267, 1429)
Pande, N.K (393, 394, 2767)
Pande, P.C. (395, 663, 664, 665, 666, 667, 668, 669, 670, 694, 1227, 1333, 1340, 1341, 1342, 1346, 1411, 1412, 1413, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1494, 1984, 1985, 1986, 1987, 1988, 2002, 2211, 2377, 2433, 2526, 2544, 2560, 2561, 2766, 2768, 2769, 2770, 2771, 2772, 2773, 2774, 2775, 2781, 2938, 3009, 3010, 3011, 3014, 3015, 3102, 3103, 3109, 3110, 3111, 3112,)
Pande, P.K. (671, 672, 673, 2466)
Pande, R. (502)
Pande, R.C. (2776)
Pande, S. (3084)
Pande, T.D. (1455)
Pande, V.N. (2550, 2767)
Pande, Y.N. (2619, 2803)
Pandey, A. (159, 1726, 1729, 2462, 2564, 2778, 2779, 2780)
Pandey, A.N. (800)
Pandey, Anjula (2777)
Pandey, B. (161, 2781)
Pandey, B.K. (1175)
Pandey, C. (2804, 2805)
Pandey, D. (2990)
Pandey, D.C. (1471, 1474)
Pandey, D.K. (1465)
Pandey, D.S. (950)
Pandey, G. (647, 2327, 2548, 2550, 2551, 2553, 2767, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2789, 2803, 2817)
Pandey, H.C. (1989, 1990, 1991, 2478)
Pandey, H.P. (607, 2790, 2791, 2966)
Pandey, H.S. (2792, 2793, 2794)
Pandey, I.B. (2795, 3115)
Pandey, J. (68)
Pandey, K. (2796, 2797)
Pandey, K.C. (2798)
Pandey, K.N. (1566, 1568)
Pandey, M.J. (2340, 3101)
Pandey, M.M. (2758)
Pandey, N. (608, 609, 2455)
Pandey, N.C. (674, 2799, 2800, 2801)
Pandey, N.K. (1992, 2189, 2288, 2547, 2551, 2552, 2553, 2786, 2787, 2788, 2789, 2802, 2803)

Pandey, P. (925)
Pandey, R.K. (1019, 1020, 2804, 2805)
Pandey, S. (2637, 2796)
Pandey, S.K. (675, 676, 770)
Pandey, S.N. (1466, 1467, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 2205)
Pandey, U. (926)
Pandey, U.C. (1321, 1322, 1323, 1326, 1327, 1328, 1329, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1574, 1575)
Pandey, V. (677)
Pandey, V.C. (2623)
Pandey, V.N. (1601)
Pandit, A. (14)
Pandit, M.K. (678)
Pandro, V. (1635)
Pangtey, Y.P.S. (84, 375, 376, 426, 463, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 830, 831, 832, 833, 834, 836, 837, 868, 870, 912, 913, 914, 919, 1163, 1194, 1374, 1456, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1537, 1550, 1551, 1621, 1813, 1814, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1826, 1827, 1828, 1829, 1844, 1845, 1846, 1847, 1848, 1849, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1987, 1988, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2127, 2128, 2129, 2264, 2294, 2537, 2593, 2769, 2806, 2807, 2808, 2871, 3048, 3113, 3151)
Panigrahi, G. (304, 697, 698, 699, 700, 701, 702, 748, 749, 782, 1788, 1885, 2020, 2076)
Pant, A.K. (2688, 2690)
Pant, G. (1509, 1511)
Pant, G.B. (1510)
Pant, G.C. (2809)
Pant, H.M. (2810, 2811)
Pant, K. (14)
Pant, K.C. (640, 641, 1979, 1980, 1981, 2729, 2741, 2748, 2749)
Pant, M. (2812)
Pant, N. (2810)
Pant, P. (2340)
Pant, P.C. (703, 704, 705, 2010, 2011)
Pant, R. (706)
Pant, S. (146, 707, 708, 709, 710, 920, 921, 1512, 1513, 1552, 2012, 2813, 2814, 2815, 2816, 2896)
Pant, S.C. (142, 2817)
Pant, V. (1514, 1632, 1633)
Pant, V.K. (2744, 2747)
Pant, Y.K. (1982)
Panthri, D. (1253)
Panwar, G.S. (387, 711, 712, 713, 2295)
Panwar, M.S. (2409)
Panwar, P. (714, 732)
Pareek, S.K. (647)
Parhar, K. (2818)
Parihaar, R.S. (2819)
Parihar, K. (715)
Parker, R.N. (716, 717)
Parveen, M. (718, 858)
Pasha, M.K.S. (470)
Paszko, B. (2013)
Patel, S.P. (2397)
Pathak, J.K. (1464)
Pathak, M.C. (719)
Pathak, R. (2755)
Pathak, R.P. (720)
Patil, R.P. (721, 722)
Paul, S.R. (2014)
Pawar, B.S. (472)
Pawar, R.S. (299)
Payal, K.C. (2594)
Pearson, G.T. (723)
Pelvi, S.K. (3038)
Pennell, F.W. (724)
Pharswan, A.S. (881)
Phartyal, S.S. (2820)
Phondani, P.C. (2594, 2671, 2753, 2754, 2821, 2822, 2823, 2824, 2825)
Phukan, S. (725)
Pimenov, M.G. (726, 727, 728, 729)
Pokharia, D.S. (2773)
Pokhriyal, P. (1188)
Pokhriyal, T.C. (587)
Polunin, O. (730)
Poonam, K. (2826)
Powell, P.B.H. (731)
Prabha, S. (479)
Prabhakaran, V. (2330)
Prabhu, S.V. (732)
Prachi (2827)
Pradeep, S.V. (2015)
Prain, D. (1771)
Prajapati, V.K. (2828)
Prakash, A. (1058, 1059, 1060, 2296, 2829, 2830, 3029, 3030, 3031, 3032, 3033, 3034, 3036, 3158)
Prakash, J. (1394, 1396, 1397)
Prakash, P. (733)

Prakash, R. (2831, 2832)
Prakash, V. (610, 611, 618, 619, 734, 1515, 2016, 2017, 2375, 2376, 2377)
Pranita (2674, 2706, 2707)
Prasad, B.N. (735)
Prasad, D. (1270)
Prasad, J. (1080)
Prasad, K. (161)
Prasad, P. (136, 1025)
Prasad, R. (1672, 1831, 2074)
Prasad, S. (2833)
Prasad, S.N. (871, 2297)
Prasad, V.P. (2018)
Priyanka (2834)
Pundir, Y.P.S. (736, 737, 738, 739, 740, 741, 742, 743, 744, 2429, 2430, 2835, 2836, 2837, 2838, 2839, 2840, 2841, 2842, 2843)
Punetha, D. (714)
Punetha, N. (1196, 1351, 1352, 1362, 1363, 1364, 1365, 1372, 1391, 1482, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1869, 1870, 2212)
Punetha, P. (1242, 1528, 1529, 1531, 1532)
Puri, H.P. (2533, 2534)
Purohit, A. (745, 2844)
Purohit, A.N. (26, 94, 617, 746, 747, 872, 942, 2720, 2845, 2846, 2847)
Purohit, B.P. (385)
Purohit, K. (2848)
Purohit, K.M. (748, 749, 2019, 2020)
Purohit, M.C. (744, 750, 751)
Purohit, M.V. (752, 2403)
Purohit, V. (2440, 2443)
Purohit, V.K. (113, 753)
Purohit, V.P. (280, 2849, 2850)
Purohit, Y.P. (2509)
Pusalkar, P.K (166, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 1076, 1148, 1151, 1722, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2186)
Raghubanshi, A.S. (2984)
Raha, A. (542)
Rahul, J. (2851)
Rai, A. (764)
Rai, I.D. (765, 766, 767, 768, 769, 1038, 1039, 1533, 1829, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2315, 2316)
Rai, J.P.N. (1092)
Rai, K. (902)
Rai, S.K. (770)
Raiwani, S. (2249)
Raizada, A. (771)
Raizada, M.B. (579, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 890, 1962, 1963, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074)
Rajagopal, T. (697, 698, 699, 782, 2075, 2076)
Rajan, S. (2852)
Rajbhandari, K.R. (783)
Rajendran, A. (884, 1571, 2256)
Rajkumar (784, 1023)
Rajkumar, D. (1597)
Rajkumar, K. (2330)
Rajkumar, S.D. (1534, 1535, 1536, 1606)
Rajput, R. (714)
Rajvanshi, A. (785, 2385)
Rajwar, G.S. (10, 114, 300, 485, 486, 786, 787, 788, 789, 790, 791, 792, 2077, 2078, 2278, 2405, 2853, 2854, 2855)
Ralhan, P.K. (793, 794, 1081)
Ram, J. (341, 464, 795, 796, 797, 798, 799, 879, 2939)
Ram, S. (2353)
Ramchandra, T.V. (2297)
Rana, B.B. (935)
Rana, B.S. (800, 880)
Rana, C.S. (192, 251, 801, 857, 1157, 2079, 2080, 2081, 2101, 2107, 2197, 2198, 2443, 2459, 2460, 2461, 2856, 2857, 2858, 2859, 2860, 2861, 3108, 3114)
Rana, I. (214)
Rana, S. (802, 1253)
Rana, T.S. (194, 803, 804, 805, 1196, 1983, 2082, 2212, 2299, 2862, 2863)
Rana, U. (517)
Rana, V. (801, 2080)
Ranhotra, P.S. (441)
Rani, A. (2812, 2875)
Rani, K. (1268)
Rani, M. (1537)
Ranjan, V. (602, 806, 807, 808, 809, 1205, 2864, 2865)
Rao, A.S. (1893. 2083, 2084)
Rao, B. (945)
Rao, C.V. (3054)
Rao, K. (2731)
Rao, K.S. (422, 514, 515, 517, 626, 745, 810, 811, 2594, 2595, 2667, 2668, 2669, 2670, 2671, 2705, 2724, 2725, 2726, 2727, 2728, 2825, 2844, 2866)
Rao, M.V. (812)
Rao, N.P.C. (2867)
Rao, N.S.V.P. (384, 2867)

Rao, R.R (81, 170, 183, 194, 347, 803, 804, 805, 813, 814, 815, 903, 1183, 1214, 1590, 1591, 1736, 1983, 2085, 2299, 2402, 2686, 2862, 2863, 2887)
Rao, T.A. (816, 817, 818, 2086, 2090, 2091, 2092)
Rastogi, J. (802, 819, 1723)
Rath, C. (2624)
Ratha, K.K. (2868)
Rathi, R.S. (2704)
Rathod, D. (454)
Rathore, D.K. (1538)
Rathoure, S.S. (1982)
Raturi, D.P. (1687)
Raturi, G.P. (286)
Rau, M.A. (820, 821, 822, 823, 824, 825, 2087, 2088, 2089, 2090, 2091, 2092, 2869)
Rauf, A. (1898)
Raut, N. (826, 2874)
Raut, N.B. (2873)
Rautela, B. (1168)
Rawal R.S. (26, 111, 112, 209, 210, 211, 244, 246, 689, 695, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 842, 843, 844, 915, 916, 918, 919, 1374, 1495, 1496, 1497, 1504, 1724, 1725, 1727, 1729, 2245, 2308, 2309, 2310, 2311, 2469, 2755, 2899, 2900, 2901, 2902)
Rawat, A. (838, 1894, 1972, 2883)
Rawat, A.K.S. (2758, 3048)
Rawat, A.S. (854)
Rawat, B. (155, 244, 835, 839, 840, 841, 842, 843, 844, 1724, 1725, 1727, 2870)
Rawat, B.S. (845)
Rawat, D.S. (96, 165, 166, 281, 282, 284, 285, 403, 614, 615, 718, 819, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 1166, 1167, 1168, 1253, 1720, 1721, 1722, 1723, 1740, 1741, 1743, 1744, 1745, 1746, 1747, 1748, 1782, 1783, 1797, 2079, 2081, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2195, 2196, 2197, 2198, 2234, 2250, 2300, 2301, 2400, 2449)
Rawat, G.S. (4, 6, 53, 54, 105, 153, 302, 342, 343, 370, 371, 372, 373, 374, 375, 376, 377, 419, 421, 470, 477, 480, 481, 482, 483, 563, 584, 684, 690, 691, 694, 696, 765, 766, 767, 768, 769, 826, 859, 860, 861, 862, 864, 865, 866, 867, 868, 869, 870, 871, 863, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1170, 1179, 1180, 1374, 1458, 1483, 1488, 1492, 1493, 1498, 1499, 1533, 1539, 1588, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1825, 1826, 1827, 1828, 1829, 1848, 1849, 1887, 1888, 1997, 2004, 2006, 2007, 2008, 2056, 2057, 2058, 2059, 2061, 2062, 2063, 2064, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2200, 2201, 2202, 2203, 2263, 2272, 2273, 2274, 2302, 2303, 2304, 2305, 2306, 2316, 2331, 2332, 2333, 2334, 2385, 2589, 2622, 2807, 2808, 2871, 2872, 2873, 2874, 2989, 2990, 2991, 3145, 3146)
Rawat, H. (2875)
Rawat, J.K. (872, 2307)
Rawat, J.S. (885)
Rawat, K.K. (873, 1429, 1540, 1605, 2222)
Rawat, L. (2630)
Rawat, L.S. (656, 2671, 2754, 2825)
Rawat, M. (2876)
Rawat, M.S. (2990, 3082)
Rawat, N. (2489, 2877)
Rawat, P.S. (305)
Rawat, R. (646, 2328, 2750, 2878, 2879)
Rawat, R.S. (84, 874, 953, 1505)
Rawat, S. (475, 1280, 1541, 1542, 1543, 2247)
Rawat, T.S. (2437)
Rawat, V.R.S. (875, 1118)
Rawat, V.S. (2880, 2881, 2882)
Rawat, Y.S. (5, 7, 8, 88, 89, 267, 463, 719, 876, 962, 1104, 2882)
Rayal, A. (2743)
Razvi, S. (2761)
Reddy, M.S. (1384)
Reddy, Y.V. (2535)
Renu (241, 1894, 1972, 2883)
Renu, S. (1970)
Renz, J. (2119)
Riaz, T. (100)
Rikhari, H.C. (2313)
Rikhari, H.C. (7, 8, 876, 877, 878, 879, 880)
Rivera, M.C. (1270)
Rizwana, A.R. (1238, 1239, 1240)
Rohatgi, N. (2638)
Rowal, A.S. (881)
Roy, B. (2884)
Roy, G.P. (218, 219, 882, 883, 976, 2120, 2121)
Roy, M.K. (2709)
Roy, P.S. (971)
Roy, R.K. (884)
Roy, S.K. (3064)
Rungsung, W. (2868)
Sachan, A.K. (2885)
Sachan, M.S. (1171)
Sachan, N.K. (2885)
Sachan, S. (838, 2217)
Sachan, S.N. (109, 838, 1544)
Sachdev, A. (1326)

Sadana, G. (2516, 2517, 2518, 2519)
Safeer, R. (1545)
Sagar, V. (238)
Saggoo, M.I.S. (124)
Sah, B.C.L. (2122)
Sah, P. (1105)
Sah, S. (885)
Saha, S. (2662, 2663, 2664, 2665, 3039, 3040, 3041)
Sahai, B. (886)
Sahai, K. (873, 888)
Sahai, R. (887, 1546)
Sahni, K.C. (778, 889, 890, 891)
Sahu, R.K. (1012, 1014, 1016, 2148, 2149, 2154)
Sahu, V. (1221, 1222, 1223, 1402, 1403, 1405, 1429, 1547, 1548)
Saini, D.C. (892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 1095, 1096, 2123, 2124, 2125, 2126, 2175, 2886)
Saini, L. (1938)
Saini, S.S. (51, 1549)
Sajwan, B.S. (2590, 2912)
Saklani, A. (903, 2299, 2531, 2532, 2887, 3008)
Saklani, D. (2888)
Saklani, K. (1281)
Saklani, K.P. (1171)
Saklani, P.L. (2331, 2332, 2333, 2334)
Saklani, P.M. (2889)
Samal, P.K. (2890)
Samant, S.S. (84, 145, 146, 209, 210, 211, 401, 402, 685, 686, 687, 688, 689, 690, 691, 695, 708, 709, 710, 720, 837, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 1374, 1484, 1485, 1486, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1504, 1505, 1506, 1513, 1550, 1551, 1552, 1998, 1999, 2000, 2001, 2003, 2004, 2127, 2128, 2129, 2244, 2245, 2294, 2308, 2309, 2310, 2311, 2554, 2555, 2808, 2815, 2816, 2848, 2891, 2892, 2893, 2894, 2895, 2896, 2897, 2898, 2899, 2900, 2901, 2902, 2903)
Samra, J.S. (771)
Sandeep (3080)
Sanjeev (922)
Sankhayan, P.L. (922)
Sant, H.R. (2393)
Sanwal, P. (3100)
Sanyal, S.K. (1553)
Saradhi, P.P. (2911, 2912, 2913)
Saran, R. (700, 701)
Sarraf, A. (2780)
Sathyakumar, S. (377, 871, 2306)
Sati, J. (149, 3137)
Sati, S.C. (1369, 1554)
Satija, C.K. (1250)
Satyal, G.S. (2903)
Sawan, S. (220, 2480, 2904)
Saxena, A.K. (426, 793, 923, 924, 925, 926, 927)
Saxena, A.P. (340, 928, 2905, 2906, 2907)
Saxena, B.K. (929)
Saxena, D.K. (930)
Saxena, H.O. (207, 779, 781, 931, 932, 933, 2073, 2130)
Saxena, K.G (515, 517, 626, 810, 811, 2248, 2668, 2669, 2671, 2705, 2725, 2726, 2728, 2825, 2866)
Saxena, N. (2908)
Saxena, P. (2397)
Saxena, S. (1282, 1283)
Saxena, S.K. (2909, 2910)
Sayok, A.K. (2981)
Schmidt, E. (934)
Seema (935)
Sehgal, D. (1555, 1556)
Seidenfaden G. (936)
Sekar, B. (441)
Semwal, B.D. (1113)
Semwal, D.P. (937, 938, 1189, 1231, 1570, 2911, 2912, 2913, 2914)
Semwal, J.K. (277, 872, 939, 940, 941, 942, 1557, 2504, 2510, 2511, 2514, 2915)
Semwal, K.C. (1245, 1558, 1559, 1560)
Semwal, M. (2338)
Semwal, O.P. (692, 696)
Semwal, R.C. (1579, 1580)
Semwal, R.L. (516, 2670, 2671, 2728)
Semwal, S. (943)
Semwal, S.C. (2944)
Sen, A. (1527, 1530)
Sen, D.N. (944)
Sengar, R.M.S. (1399)
Sengupta, T. (2297)
Seth, Ankit (2628)
Sethi, N. (2719)
Sethi, P. (945)
Shah, B.C. (2617)
Shah, B.C.L. (2542)
Shah, K.K. (2916)
Shah, N.C. (946, 1086, 1087, 2172, 2917, 2918, 2919, 2920, 2921, 2922, 2923, 2924, 2925, 2926, 2927, 2928, 2929, 2930, 2931, 2932, 2933, 2934)
Shah, R. (580, 2935, 2936, 2937, 2938)
Shah, S. (659, 2882, 2939)
Shah, S.C. (3012)

Shankar, R. (947, 2398)
Shankar, V. (208, 436, 2957)
Sharma, A. (192, 471, 974, 1371, 1561, 2361, 2458, 2459, 2460, 2461, 2530, 2857, 2861, 3054)
Sharma, A.K. (261, 262, 263, 264, 427, 647, 948, 949, 1982, 2703)
Sharma, B.D. (950, 2940)
Sharma, C. (2379, 2941)
Sharma, C.M. (59, 60, 61, 247, 248, 249, 250, 251, 303, 478, 485, 486, 555, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 1146, 1157)
Sharma, D. (2378)
Sharma, E. (2942)
Sharma, G. (2943)
Sharma, G.P. (1387)
Sharma, I.P. (2483, 2596, 2944)
Sharma, J. (66, 2312, 2487, 2505, 2512, 2513, 2945, 2946, 2947, 2948, 2949, 2950, 2951, 2952, 2953)
Sharma, J.P. (963, 964, 2131)
Sharma, J.R. (461, 965, 1187, 1257, 1258, 1259, 1260, 1261, 1262, 1389, 1390, 1545, 1555, 1556, 1562, 1563, 1564, 1565, 1566, 1567, 1568)
Sharma, K.D. (2426)
Sharma, L. (2413)
Sharma, M. (2132)
Sharma, M.L. (3042)
Sharma, M.P. (624, 966, 967, 968, 969, 1228, 1373, 1569, 1678, 2133, 2514)
Sharma, M.R. (564)
Sharma, N. (109, 174, 205, 206, 2438, 2480, 2811, 2954, 2955, 3045)
Sharma, N.K. (2756)
Sharma, O.R. (2370)
Sharma, P. (1538, 1570, 2413, 2955)
Sharma, P.C. (970, 1003, 1176)
Sharma, R. (2956)
Sharma, R.C. (320, 2361)
Sharma, R.K. (216, 2957)
Sharma, S. (101, 211, 971, 880, 1366, 1646, 2313, 2339, 2398, 2884, 2958)
Sharma, S.C. (512, 562, 671, 672, 673, 884, 972, 973, 974, 1571, 2134, 2256, 2283, 2959, 2960, 2961, 2962, 2963, 2964)
Sharma, S.D. (552, 1117, 1118)
Sharma, S.K. (2307, 2370)
Sharma, U. (2461)
Sharma, Y.P. (2951)
Sheikh, M.A. (2278, 2627)
Shinde, P. (2370)
Shiva, V. (3138)
Shrestha, B.B. (1572)
Shridhar, V. (714, 732)
Shrivastava, R.J. (420)
Shrivastava, S.L. (1251)
Shukla, A.N. (1065, 1149, 1151, 1573, 1874, 1875, 2135)
Shukla, B.K. (218, 975, 976, 977, 978, 1123, 2121, 2135)
Shukla, D.S. (3093)
Shukla, G. (979, 1206, 1208, 1209, 1210, 2610, 2612, 2613, 2614, 2965, 2966)
Shukla, H.M. (1327, 1328, 1329, 1472, 1473, 1475, 1574, 1575)
Shukla, H.Y. (647)
Shukla, M. (1396)
Shukla, M.K. (1175)
Shukla, M.S. (1600)
Shukla, P. (1576)
Shukla, R.P. (675, 676, 770)
Shukla, S.K. (1395)
Shukla, V. (1577, 1578)
Siddiqi, T. (2487)
Siddiqi, T.O. (2952, 2953)
Siddique, M.O. (2136, 2137)
Siddiqui, B. (2527)
Siddiqui, M. (2392)
Siddiqui, M.B. (980, 2967, 2968, 2969)
Siddiqui, M.K. (3073, 3074, 3077)
Siddiqui, M.O. (1767)
Sikarwar, R.L.S. (981, 2970)
Silas, R.A. (280, 982, 983, 984, 985, 986, 1781, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2416, 2849, 2850)
Silas, S.A. (2509)
Silori, C.S. (987, 988, 2971)
Singh, A. (93, 94, 192, 427, 516, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1069, 1075, 2314, 2379, 2397, 2621, 2972, 2973, 2974, 2975, 2976, 2977, 2978, 2979, 2980, 2981, 3056)
Singh, A.G. (2623)
Singh, A.K. (1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1585, 1768, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2628, 2982, 2983, 2984, 2985, 2986, 3050)
Singh, A.N. (702)
Singh, A.P. (507, 1021, 1022, 1023, 2987, 2988)
Singh, Ayush K. (2154)
Singh, B. (185, 476, 479, 1024, 1025, 2601, 2712)
Singh, B.B. (2541)
Singh, B.K. (2644)

Singh, B.P. (1026)
Singh, B.S. (2641)
Singh, C. (1344, 1414, 1415, 1428, 1585)
Singh, C.B. (2601)
Singh, D. (1027, 1457, 1463, 1596, 2155, 2399, 2601, 2835, 2836, 2837, 2838, 2839, 2840, 2841, 2842, 2843)
Singh, D.K (756, 757, 758, 759, 763, 1028, 1029, 1150, 1186, 1187, 1381, 1579, 1580, 1581, 1589, 1594, 1595, 1596, 1728, 1942a, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2170, 2210, 3055)
Singh, D.V. (2601)
Singh, E.M. (510)
Singh, G. (482, 768, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2315, 2316, 2989, 2990, 2991)
Singh, G.S. (2826, 2978)
Singh, H. (17, 311, 490, 856, 1042, 1111, 1173, 1582, 1646, 2107, 2156, 2157, 2317, 2318, 2336, 2337, 2338, 2339, 2526, 2655, 2656, 2916, 2992, 2993, 2994, 2995, 2996, 2997, 2998, 2999, 3000, 3001, 3002, 3003, 3004, 3005, 3006, 3007, 3008, 3009, 3010, 3011, 3012, 3013, 3014, 3015, 3133, 3134)
Singh, H.B. (1118, 3038)
Singh, H.N. (3086)
Singh, J. (1265, 1266, 1583, 1607, 1971, 2340, 2713, 2715, 2716, 2717, 2718, 3016, 3017, 3018, 3019, 3100, 3147, 3148)
Singh, J.J. (793)
Singh, J.L. (2601)
Singh, J.N. (1043, 1044)
Singh, J.P. (2657, 2658, 2659, 2660, 2661)
Singh, J.S. (338, 553, 554, 794, 798, 924, 925, 926, 927, 1045, 1046, 1047, 1048, 1049, 1065, 2984)
Singh, K. (1867, 2352)
Singh, K.K. (506, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 2158, 2296, 2662, 2663, 2664, 2665, 2685, 2829, 2830, 3020, 3021, 3022, 3023, 3024, 3025, 3026, 3027, 3028, 3029, 3030, 3031, 3032, 3033, 3034, 3035, 3036, 3037, 3038, 3039, 3040, 3041, 3042, 3065)
Singh, K.P. (977, 1065, 1270, 3043, 3044)
Singh, L. (178, 431, 3045)
Singh, L.R. (2483)
Singh, Lal Ji (3157)
Singh, M. (355, 1066, 1067, 1584, 1585, 3046)
Singh, M.K. (1068, 3091)
Singh, M.P. (1067, 1069, 1075, 1096, 1247, 1330, 2319, 2353, 2805, 3046)
Singh, N. (858, 1168, 1280, 2529, 2530, 3047, 3048, 3049, 3113)
Singh, N.B. (122, 1707, 2159, 2160)
Singh, N.P. (1070, 1071, 1072, 2161, 2162, 2163)
Singh, O.P. (1073, 1093, 3050)
Singh, P. (132, 259, 763, 1017, 1069, 1074, 1075, 1076, 1638, 1749, 2150, 2151, 2980, 3051)
Singh, P.B. (3052)
Singh, P.K. (603, 1077, 1397, 2164, 2976, 2978, 3053, 3054)
Singh, P.N. (1586)
Singh, Priyanka (1020, 2985)
Singh, R. (1078, 2165, 2491, 2718, 3055)
Singh, R.B. (2641, 3050)
Singh, R.G. (2476, 2477)
Singh, R.H. (3053, 3054)
Singh, R.K. (1003, 1079, 1112, 2499, 2980, 3056)
Singh, R.N. (2986)
Singh, R.P. (305, 1080, 1541, 1542, 1543)
Singh, R.S. (1081)
Singh, Richa (604, 605)
Singh, S. (524, 891, 930, 965, 1015, 1016, 1018, 1020, 1186, 1581, 1587, 1588, 1589, 1590, 1591, 1691, 1737, 1920, 1923, 1924, 1942a, 2054, 2131, 2148, 2153, 2166, 2167, 2168, 2169, 2170, 2187, 2292, 2616, 3057)
Singh, S.C. (1026, 1061, 1082, 1083, 1084, 1085, 1086, 1087, 1593, 2171, 2172, 2173, 3035, 3058, 3059, 3060, 3061, 3062)
Singh, S.D. (556, 2805)
Singh, S.K. (41, 44, 421, 901, 902, 1012, 1013, 1073, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1137, 1534, 1535, 1536, 1592, 1594, 1595, 1596, 1597, 1606, 2164, 2174, 2175, 2238, 2601, 2986)
Singh, S.M. (536, 537, 606, 1097, 1175)
Singh, S.P. (8, 89, 266, 506, 507, 794, 796, 798, 877, 878, 879, 927, 1047, 1048, 1049, 1062, 1081, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1160, 1161, 1195, 2320, 3063, 3064, 3065)
Singh, S.R. (1226)
Singh, T. (192)
Singh, T.C.N. (1598)
Singh, T.N. (2319)
Singh, U. (1246, 1388, 2650, 2714, 2715, 2716, 2717, 2718, 3066, 3067, 3068)
Singh, U.N. (1106)
Singh, U.S. (1600)

Singh, V. (258, 440, 1107, 1108, 1109, 1110, 1111, 1112, 1173, 1599, 1943, 1944, 1945, 1946, 2156, 2176, 2177, 2178, 2179, 3069, 3070)
Singh, V.K. (2497, 2498, 2499, 3071, 3072, 3073, 3074, 3075, 3076, 3077)
Singh, V.N. (1113)
Singh, V.P. (662, 1114, 1115, 1116, 3078, 3091)
Singh, Y.P. (1280)
Singhal, R.M. (1117, 1118)
Singhal, V.K. (126, 2539, 2635)
Sinha, A.B. (887, 1600)
Sinha, B. (3079)
Sinha, B.K. (978, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1207, 1208, 1209, 1210, 1620, 1748, 1863, 2180, 2221, 2321, 2532)
Sinha, G.P. (1287, 1288, 1289, 1290)
Sinha, R.L. (1130)
Sinha, S. (102, 483, 1131, 1405)
Sivakumar, K. (542)
Smythe, F. S. (1132)
Sodhi, S. (1133)
Solanki, R. (542)
Sonam (1134, 1219)
Soni, A. (732)
Soni, P. (547, 935, 1135)
Soni, S. (785)
Sood, A. (1269)
Sood, O.P. (65)
Spanner, T.W. (1790)
Sridhar, V. (2403)
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Srivastava, A. (237, 711, 1002, 1235, 2157, 2181, 2182, 2322, 2397, 2398)
Srivastava, A.K. (67, 68, 1136, 1137, 1393, 1394, 1397, 3085)
Srivastava, B. (1404, 1601)
Srivastava, C. (3083, 3084, 3085, 3086, 3090)
Srivastava, G. (73)
Srivastava, G.D. (1138, 1139)
Srivastava, G.N. (1593, 2173, 3061, 3062)
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Srivastava, J.G. (1140, 1141)
Srivastava, J.N. (110)
Srivastava, K. (930, 3042)
Srivastava, M. (1018, 1019, 1142, 1353, 1405, 1602, 1603, 2147, 2149, 2150, 2151, 2152, 2153, 2379, 3136)
Srivastava, M.M. (203, 204, 294, 295, 785, 1143, 1144, 1145)
Srivastava, M.N. (735)
Srivastava, N. (2639, 3087, 3088)
Srivastava, P.B.L. (933)
Srivastava, P.K. (1145, 2611, 2612, 2613, 2614, 3089)
Srivastava, R. (2719)
Srivastava, R.C. (1072, 1114, 1115, 1116, 1604, 2183, 2184, 2185, 3078, 3086, 3090, 3091)
Srivastava, R.J. (452)
Srivastava, R.K. (1146, 1174)
Srivastava, S. (2152, 2719)
Srivastava, S.C. (1605)
Srivastava, S.K. (29, 156, 158, 483, 711, 712, 713, 760, 761, 762, 763, 1076, 1147, 1148, 1149, 1150, 1151, 1152, 1263, 1264, 1380, 1534, 1535, 1536, 1597, 1599, 1606, 1656, 1657, 1679, 1726, 1728, 1860, 1886, 1928, 2041, 2042, 2043, 2044, 2045, 2046, 2048, 2050, 2178, 2179, 2181, 2182, 2186, 2187, 2284, 2285, 2295, 2322, 2323, 2324, 2687, 3069, 3092, 3093)
Srivastava, S.L. (1607)
Srivastava, Smrita (2985)
Srivastava, T.N. (1153, 1769)
Srivastava, V.K. (1154, 2747)
Srivastva, S.K. (2049)
Stainton, A. (730)
Steam, W.T. (1155)
Stephenson, S.L. (1560)
Stewart, R.R. (1156)
Subrahmanyeswari, B. (3094)
Sultan, Z. (2434)
Sumeet, G. (1231)
Sumit, M. (2325)
Sundaresan, V. (2157)
Sundriyal, R.C. (2441, 2442, 2443, 2646, 2757, 2860, 3095, 3096, 3097)
Sur, P.R. (115)
Suri, R.K. (2542)
Susanna, A. (2228)
Suseela, M.R. (1274, 1275, 1355, 1356, 1357, 1382, 1608, 1609, 1610)
Suyal, S. (247, 248, 249, 250, 251, 956, 957, 958, 959, 960, 961, 1157)
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Talukdar, G. (542)
Tamta, B.P. (2326, 2488, 2489, 3098)
Tamta, S. (306)
Tayal, M.S. (1158)
Tewari, A. (14, 464, 1621, 2367, 2445, 2455)
Tewari, B. (799)
Tewari, D.D. (2619, 2620, 2623)
Tewari, G. (1163, 1621)
Tewari, I. (396, 3099)
Tewari, J.C. (89, 880, 1159, 1160, 1161, 1195)

Tewari, J.K. (2511, 2742)
Tewari, J.P. (2620, 3093)
Tewari, K. (396)
Tewari, K.C. (1162, 2188, 2189, 2199, 2327, 2545, 2767, 2786, 2787, 2788, 3099)
Tewari, L. (2774)
Tewari, L.C. (2340, 3100, 3101)
Tewari, L.M. (306, 508, 509, 674, 693, 1163, 1194, 1487, 1489, 1490, 1491, 1500, 1501, 1502, 1505, 1506, 1507, 1508, 1537, 1611, 1621, 1823, 1824, 2005, 2009, 2178, 2179, 2231, 2233, 2264, 2280, 2368, 2410, 2411, 2412, 2423, 2445, 2455, 2642, 2643, 2644, 2647, 2775, 2799, 2800, 2801, 3102, 3151)
Tewari, M. (1531)
Tewari, R.B. (1612)
Tewari, R.N. (1991, 2189, 2327, 2553, 2767, 2803)
Tewari, S.C. (405, 1164, 1613)
Tewari, S.D. (1253, 1509, 1510, 1511)
Tewari, V.P. (392, 397, 1334, 2549, 2802)
Tewari, K.C. (2802, 2803)
Thadani, R. (2320)
Thakur, I.K. (437)
Thakur, J. (101)
Thakur, R.K. (1748)
Thakur, U. (100)
Thapliyal, C. (3081, 3082)
Thapliyal, R.C. (587, 2820)
Thongam, B. (693)
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Tiwari, A.P. (42, 43, 1835, 2135, 2190, 2191, 2192, 2193, 2360)
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Tiwari, D.N. (393)
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Tiwari, G.L. (1574, 1575)
Tiwari, J.K. (75, 279, 283, 284, 614, 615, 642, 643, 644, 718, 855, 856, 857, 858, 1166, 1167, 2081, 2108, 2194, 2195, 2196, 2197, 2198, 2399, 2400, 2506, 2507, 2745, 2746, 2748, 2749, 2857, 2858, 2859, 2860, 2861, 3104, 3105, 3106, 3107, 3108)
Tiwari, K.C. (397, 2265, 2547, 2548, 2549, 2550, 2551, 2552, 2553)
Tiwari, L. (2433, 2938, 3103, 3109, 3110, 3111, 3112)
Tiwari, L.M. (1503, 2758, 3113)
Tiwari, P. (75, 284, 615, 718, 855, 856, 857, 858, 1166, 1167, 1168, 1576, 2108, 2194, 2195, 2196, 2197, 2198, 2399, 2400, 3105, 3106, 3107, 3108)
Tiwari, R. (3114)
Tiwari, R.K. (1474, 3053, 3054)
Tiwari, R.N. (1837, 2199, 2265, 2552)
Tiwari, S. (517, 3115)
Tiwari, S.C. (97, 99, 581, 582, 583, 1169)
Tiwari, S.P. (2797)
Tiwari, U.K. (826)
Tiwari, U.L. (1170, 2200, 2201, 2202, 2203, 2873, 2874)
Tiwari, V. (646, 2328, 2750)
Tiwary, D.N. (2340)
Todaria, N.P. (62, 91, 106, 107, 246, 283, 313, 628, 659, 660, 1171, 1188, 2240, 2760, 2761)
Tomar, A. (1172, 1173, 1174, 1175, 3116, 3117, 3118, 3119, 3120, 3121, 3122, 3123, 3124, 3125, 3126, 3127, 3128, 3129, 3130, 3131, 3132, 3133, 3134)
Tomar, J.M.S. (2833)
Tomar, R.P.S. (513, 1063)
Toppo, K. (1610)
Topwal, M. (3135)
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Tripathi, G.S. (204)
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Trivedi, B.K. (436)
Trivedi, B.S. (1622, 1931, 1932)
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Tulloss, R.E. (1560)
Turner, J.E.C. (1177)
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Tyagi, V. (1105, 2540)
Uniyal, A. (1178, 1179, 1180)
Uniyal, B. (3138)
Uniyal, B.P. (339, 461, 965, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1191, 1192, 1692, 1708, 1862, 1928, 1964, 2053, 2206, 2207, 2208, 2209, 2210, 2211)
Uniyal, K. (1623)
Uniyal, M.R. (207, 208, 361, 394, 1837, 2188, 2265, 2546, 2571, 3101, 3139, 3140, 3141, 3142, 3143, 3144)
Uniyal, P. (1188, 1246, 1388)
Uniyal, P.L. (101, 712, 937, 938, 1189, 1230, 1231, 1385, 1570, 2914)
Uniyal, S. (222, 3135)

Uniyal, S.K. (6, 53, 54, 1178, 1179, 1180, 1190, 1191, 1192, 1624, 3145, 3146)
Uniyal, V.K. (163, 869, 2273, 2274, 2305)
Upadhaya, M.L. (2877)
Upadhyay, A. (1003)
Upadhyay, G.K. (1152)
Upadhyay, R. (1193, 3147, 3148)
Upadhyay, R.C. (1245, 1384, 1558, 1559, 1560)
Upadhyay, S. (1165)
Upadhyay, Shashi (1840)
Upadhyaya, P.S. (3149)
Upadyay, S. (945)
Upreti, B.M. (2280, 2801)
Upreti, D.K. (1234, 1350, 1351, 1352, 1379, 1391, 1541, 1542, 1543, 1576, 1577, 1578, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1839, 3150)
Upreti, K. (1194, 1500, 1501, 1502, 1506, 1507, 1508, 1537, 1611, 2005, 2009, 3113, 3151)
Upreti, N. (1195)
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Upterti, K. (1503)
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Uttarakhand Biodiversity Board (2329)
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Vaid, K.M. (1198, 2213)
Vaish, U.S. (217, 1764, 2246)
Vaishya, J.K. (1732, 2214, 2215, 2216, 2217)
Vakshasya, S. (3152, 3153)
Van, Do T. (1199)
Vandana (1068).
Varma, B.K. (809)
Varma, S.K. (645)
Varshney, C.K. (1200)
Vashishta, D.P. (2752)
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Vashista, H.B. (263)
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Vasistha, H.B. (261, 262, 264, 453, 454, 1174, 2876)
Vasudeva, S.M. (1250)
Vats, M. (123)
Ved, D.K. (2330)
Veeraswami, G.G. (542)
Venkatareddi, B. (379, 1201, 2218, 2219)
Verma, A.K. (427, 491, 3154)
Verma, B.K. (219, 560, 607, 808, 979, 1124, 1125, 1126, 1127, 1128, 1129, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1934, 1935, 1936, 2180, 2220, 2221, 2321, 2791, 2792, 2793, 2794, 2828, 2966)
Verma, B.L. (1634)
Verma, D. (1041, 2991)
Verma, D.L. (2456)
Verma, K.R. (800, 1094)
Verma, N. (442)
Verma, P.K. (1540, 2222)
Verma, R.K. (1635, 2908, 3155)
Verma, R.S. (173, 300)
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Verma, S.C. (812, 1636)
Verma, S.D. (1769)
Verma, S.K. (3156, 3157)
Vijayan, L. (2297)
Vijayan, V.S. (2297)
Vijayashankar, R. (2330)
Vishvakarma, S.C.R. (2825)
Vishwakarma, M.L. (1427)
Vishwakarma, M.P. (1637)
Vishwakarma, P. (1638)
Viswanathan, M.V. (1709, 2223)
Vohra, J.N. (1211, 1213, 1639, 1640, 1641, 1642, 1643, 1644, 1680, 2224, 2225, 2226)
von Raab-Straube, E. (2228)
Vyas, K.M. (928, 2905, 2906, 2907)
Wadhwa, B.M. (1212, 1213, 1214, 1644, 2225, 2226, 2227)
Wadhwani, K. (1267)
Wang, Y.J. (2228)
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Yadav R.B. (3156, 3157)
Yadav, A.K. (173)
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Zaidi, T.H. (3076, 3077)
Zargar, K.A. (2529, 2530)
Zhang, Z. (1797)

Alpine meadow and forest

Aconitum heterophyllum Wall. ex Royle - A Threatened Medicinal Herb

Aconitum lethale Griff. - A Himalayan medicinal herb

Catamixis baccharoides Thomson - Endangered shrub of Siwalik hills

Habenaria intermedia D. Don

Rhododendron arboreum Sm. - State tree of Uttarakhand

Saussurea obvallata (DC.) Sch.Bip. - State flower of Uttarakhand

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