



Flora of Nanga Parbat (NW Himalaya, Pakistan): An Annotated Inventory of Vascular Plants with Remarks on Vegetation Dynamics

Author(s): Wolf Bernhard Dickoré and Marcus Nüsser

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Wolf Bernhard Dickoré & Marcus Nüsser

Flora of Nanga Parbat
(NW Himalaya, Pakistan)

An annotated inventory of vascular plants
with remarks on vegetation dynamics

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Addresses of the authors:

Dr Wolfram Bernhard Dickoré, Albrecht-von-Haller-Institut für Pflanzenwissenschaften,
Abteilung Systematische Botanik, Universität Göttingen, Untere Karspüle 2, D-37073
Göttingen; e-mail: wdickor@gwdg.de

Dr Marcus Nüsser, Geographisches Institut, Universität Bonn, Meckenheimer Allee 166,
D-53115 Bonn; e-mail: m.nuesser@uni-bonn.de

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Abstract

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An annotated enumeration of vascular plants from the valleys and slopes of Nanga Parbat, West Himalaya is presented. 962 native or naturalised species (and 9 additional subspecies) as well as 3 hybrids are recorded. In addition, 106 species are recorded as doubtful; the occurrence of 32 cultivated taxa is documented. All this information is based on field observations, herbarium material, a critical evaluation of literature records and on hitherto unpublished floristic data from C. Troll's 1937 expedition. The enumeration includes synonyms, vernacular and English names, data on local, altitudinal and general distribution, ecology, life-form, as well as information on status and (potential) utilisation.

Phytogeographically, the flora of Nanga Parbat is predominantly West Himalayan (26.8 %), with (Sino-) Himalayan elements comprising further 12.5 %. In accordance with the peripheral location on the extreme north-west edge of the Himalayas the Nanga Parbat flora is characterised by high proportions of Central Asian (8.6 %), Irano-Turanian (8.8 %) and Pamirean (7.9 %) elements, whereas Tibetan elements (1.9 %) are poorly represented. Within the flora of the Himalayas Nanga Parbat is a stronghold of Eurasiatic (Euro Siberian, 13.2 %) and circumpolar elements (7.6 %). Considering the high amount of relief and climatic diversity endemics are not especially well represented and total c. 6.5 %. Cosmopolitan (2.0 %), subtropical (2.6 %), and Mediterranean elements (1.6 %) form minor floristic components.

Steep orographical and climatic-ecological gradients correspond with a high degree of altitudinal variation and form a prominent feature of the flora and vegetation. Vegetation belts and formations on Nanga Parbat range from the dry-subtropical valley bottom deserts of the Indus Valley (colline belt: 1100-2000 m), through steppes and forest (submontane: 2000-2700 m, montane: 2700-3400 m), to the tree-line, scrub, dwarf-scrub, turf, and finally open scree and rock (subalpine 3400-3900 m, alpine 3900-4500 m, subnival 4500-5300 m) on the upper edge of the phanerogamic vegetation.

Floristic data are presented and problems of biodiversity and chorology are discussed. Strong altitudinal differentiation with a pronounced maximum diversity at an altitude of about 2500-3800 m was observed. Patterns of distribution and diversity are discussed mainly in the context of geo-ecological constraints. A marked irregularity of diversity at about 2300 m seems to be related to relief features and climatic factors.

The rather short-termed and limited research project revealed no clear signs of change in the species inventory due to recent human interference. The annotated enumeration of vascular plants presented here may serve as basis for subsequent investigations into the dynamics of the flora. However, repeat photography revealed environmental changes during the past 60 years. The increasing human impact on the natural resource basis and possible future perspectives are also discussed.

Zusammenfassung

Eine kommentierte Liste der Gefäßpflanzen des Nanga Parbat im nordwestlichen Himalaya wird vorgelegt. Auf der Grundlage eigener Feldarbeiten, von Herbarmaterial, und gestützt auf eine kritische Auswertung der Literatur und der bislang unpublizierten floristischen Ergebnisse der Expedition von C. Troll im Jahre 1937, werden 962 einheimische oder eingebürgerte Arten (mit neun zusätzlichen Unterarten), 3 Hybriden und 32 kultivierte Sippen für das Gebiet nachgewiesen. Bei 106 weiteren Sippen bestehen Zweifel über ihr Vorkommen bzw. über ihren Status. Für alle Taxa werden Synonyme, indigene und englische Pflanzennamen, Lokal-, Höhen- und Gesamtverbreitung, Ökologie, Lebensform, Status und Nutzungspotential angegeben.

Phytogeographisch ist die Flora des Nanga Parbat eindeutig durch west-himalayische Elemente (26,8 %) geprägt, (sino-)himalayische Elemente umfassen weitere 12,5 %. Die periphere Lage am äußersten nordwestlichen Rand des Himalaya bedingt hohe Anteile zentral-asiatischer (8,9 %), irano-turanischer (8,8 %) und pamirischer Elemente (7,9 %), während tibetische Elemente (1,9 %) zurücktreten. Eurasiatische (euro-sibirische, 13,2 %) und zirkumpolare Elemente (7,6 %) sind demgegenüber für die Verhältnisse Hochasiens gut repräsentiert. Trotz der hohen Reliefenergie und der daraus resultierenden Diversität ökologischer Nischen sind Endemiten nur schwach vertreten (ca. 6,5 %). Kosmopoliten (2,0 %), subtropische (2,6 %) und mediterrane Elemente (1,6 %) bilden geringe Anteile an der Flora des Nanga Parbat.

Entsprechend steiler Hangneigungen und starker klimatisch-ökologischer Gradienten ist eine deutliche Höhenzonierung der Flora und Vegetation charakteristisch. Vegetationszonen und -formationen reichen von trocken-subtropischen Wüsten des Indus-Talbodens (colline Stufe 1100-2000 m) über Steppen- und Waldformationen (submontan: 2000-2700 m, montan: 2700-3400 m) bis zu den oberen Waldgrenzbereichen, Gebüsch, Zwerggesträuchen, Matten, offenen Schutt- und Felshängen (subalpin 3400-3900 m, alpin 3900-4500 m, subnival 4500-5300 m) an der oberen Grenze der Gefäßpflanzen-Vorkommen.

Die Ergebnisse quantifizieren die altitudinalen Aspekte der Artendiversität, die bei 2500-3800 m Meereshöhe ein ausgeprägtes Maximum erreicht. Verbreitungs- und Diversitätsmuster werden im Zusammenhang mit den landschaftsökologischen Bedingungen diskutiert. Ein deutlicher Sprung in der Artendiversität bei ca. 2300 m Meereshöhe scheint mit Relief- und Klimabedingungen korreliert.

Aufgrund der relativ kurzen Bearbeitungsdauer ergibt das floristische Material keine erkennbaren Hinweise auf rezente anthropogene Veränderungen. Die vorliegende Datenbasis kann jedoch als Grundlage für künftige Untersuchungen über die Florendynamik dienen. Fotovergleiche dokumentieren aber bereits deutliche Umweltveränderungen während des kurzen Zeitraums der letzten 60 Jahre. In diesem Zusammenhang werden der steigende anthropogene Einfluß auf die natürlichen Ressourcen und mögliche Zukunftsperspektiven diskutiert.

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1. Introduction

The vegetation of Nanga Parbat is better known than any other region in High Asia. This is mainly due to the impressive vegetation map by Troll (1939), based on the topographical map by Finsterwalder (1938). As a matter of fact Troll (1939) mentioned a project to write a monograph on the flora and vegetation of Nanga Parbat after the completion of the botanical determinations. Initial taxonomic work on the phanerogamic herbarium material was carried out by Melchior (1939a, b, 1940), on fungi by Ulbrich (1938) and led to the description of a certain number of new species. Unfortunately, Troll's Nanga Parbat herbarium was completely destroyed during the fire at Berlin (B) on 1943-03-01 (Troll 1967, Hiepkö 1978). The actual basis of Troll's work is therefore often uncertain. On the basis of unpublished file cards, original determination lists and extant manuscripts of family treatments by H. Melchior and contemporary Berlin taxonomists, this paper presents for the first time an annotated inventory of Troll's vascular plants; consequently this study may be seen as a tribute to C. Troll on the occasion of his 100th birthday (1999-12-24).

A vast amount of taxonomic information on the flora of the Nanga Parbat area has been accumulated since the time of the early explorers, starting with Falconer in 1838. Although considerable portions have been documented in supra-regional floras, notably the Flora of Pakistan, no check-list of plants from the regions of Gilgit, Astor and the sur-



Fig. 1. Nanga Parbat and Indus valley from the ridge above Gor, W of Chamuri, 4200 m (M. Nüsser, 1994-06-18). Nanga Parbat towers more than 7000 m above the adjoining gorge of Indus river. The photo shows the altitudinal zonation of the northern declivity from the colline belt (c. 1100 m) to the main ridge and summit. The montane coniferous forests can be detected as a dark band between approximately 2700 and 3600 m.

rounding areas exists (Stewart 1982). This Flora is an attempt to collect and collate the available information, with a view to form a platform for a discussion of the phytogeographically most interesting flora of the Nanga Parbat region, and to inspire further botanical research in this part of the High Himalayas, which represents the meeting place between the Sino-Himalayan, Central Asiatic, and Irano-Turanian floristic regions.

The present study is based on a critical revision of (1) documented herbarium material including our own collections, (2) literature records, as well as (3) unpublished file cards, diaries and further archival notes from the collection of C. Troll (see unpublished sources). The different sources were consulted and identifications checked.

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This study has been supported by the DFG (German Research Council) within the framework of the Flora Karakorumensis Project (headed by Prof. Dr G. Miede, Marburg) and the Pakistan-German joint Culture Area Karakorum Project (headed by Prof. Dr I. Stellrecht, Tübingen, Prof. Dr E. Ehlers, Bonn, and Prof. Dr M. Winiger, Bonn).

The present flora evolved in parallel with forest-ecological studies by Prof. Dr U. Schickhoff (Greifswald) and ethnobotanical work by Mr R. Hansen (Bonn).

Unpublished material from the bequest of C. Troll, archived at the Geographisches Institut der Universität Bonn, was kindly made available by Prof. Dr H. Böhm (Bonn) and Prof. Dr M. Winiger (Bonn). Prof. Dr G. Buddruss (Mainz) helped us with the transcription of vernacular plant names. We are grateful for linguistic and moral support by Usama W. Azhar (Bonn/Islamabad) and J. Thornback (Kew).

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2. Area of research

2.1. Topography and geology

Nanga Parbat (8126 m), the ninth highest peak on earth, is situated 35°14'N, 74°35'E and constitutes the north-western corner of the High Himalayas. The mountain massif towers more than 7000 m above the adjoining gorge of the Indus river (c. 1100 m) in the North (Fig. 1), and more than 4500 m above the upper Rupal valley, lying South of the summit. The surface area under investigation is approximately 6700 km² (Fig. 2). By comparison, Troll's vegetation map covers 1500 km².

The high relief energy is an expression of the rapid uplift of the Nanga Parbat-Haramosh syntaxis (NPHM) along active faults and thrusts, thus including the western promontory of the Indian basement complex into the zone of collision with the Eurasian plate. The main range of Nanga Parbat consists predominantly of highly metamorphosed orthogneisses, whereas the adjoining Indus and Astor valleys are situated within the complicated system of plate boundaries between the gneisses of the Indian subcontinent, the gabbroid rocks of the Kohistan-Ladakh terrane, and the plutonites and sediments of the Eurasian plate (Zeitler 1985, Butler & Prior 1988, Malinconico & Lillie 1989, Searle 1991).

Rough topography and neotectonic activity engender land slides and other mass movements, presenting grave mountain hazards (Shroder 1989, 1993, Hewitt 1989). The extent of the pleistocene glaciation is still topic for much controversy (Finsterwalder 1938, Haserodt 1989, Owen 1989a,b, Kuhle 1996, Kamp 1999). Due to the high relief energy one can find a distinct altitudinal zonation of climate, vegetation and land use systems (Troll 1939, Nüsser 1998).

2.2. Climate

The thermic conditions of the region range from the hot and arid-subtropical valley bottoms of the colline belt up to the nival climates above the snow line at 4800-5000 m. Annual mean temperatures range from 17.8 °C (Bunji, 1372 m) to less than -5 °C at the upper edge of vascular plant life above 5200 m. In accordance with the continental position of Nanga Parbat, seasonal and diurnal differences may exceed 25 °C.

The general hygric conditions of the wider high mountain belts of the Hindukush, Karakorum and NW Himalayas are characterised by their transitional position between the monsoonal influenced southern declivity of the Himalayas and the Central Asian deserts. The SW-NE orientated gradient of decreasing annual precipitation results from the seasonally alternating circulation systems and the orographic structures (Weiers 1995). Whereas the southern declivity of the Nanga Parbat receives a higher amount of summer rainfall from monsoonal depressions, the northwestern slopes are more strongly influenced by winter precipitation from western disturbances. This horizontal differentiation is overlaid by steep vertical thermo-hygric gradients (Reimers 1992, Miehe & al. 1996) controlling the amount and the seasonal distribution of rainfall at various altitudinal and topoclimatic positions.

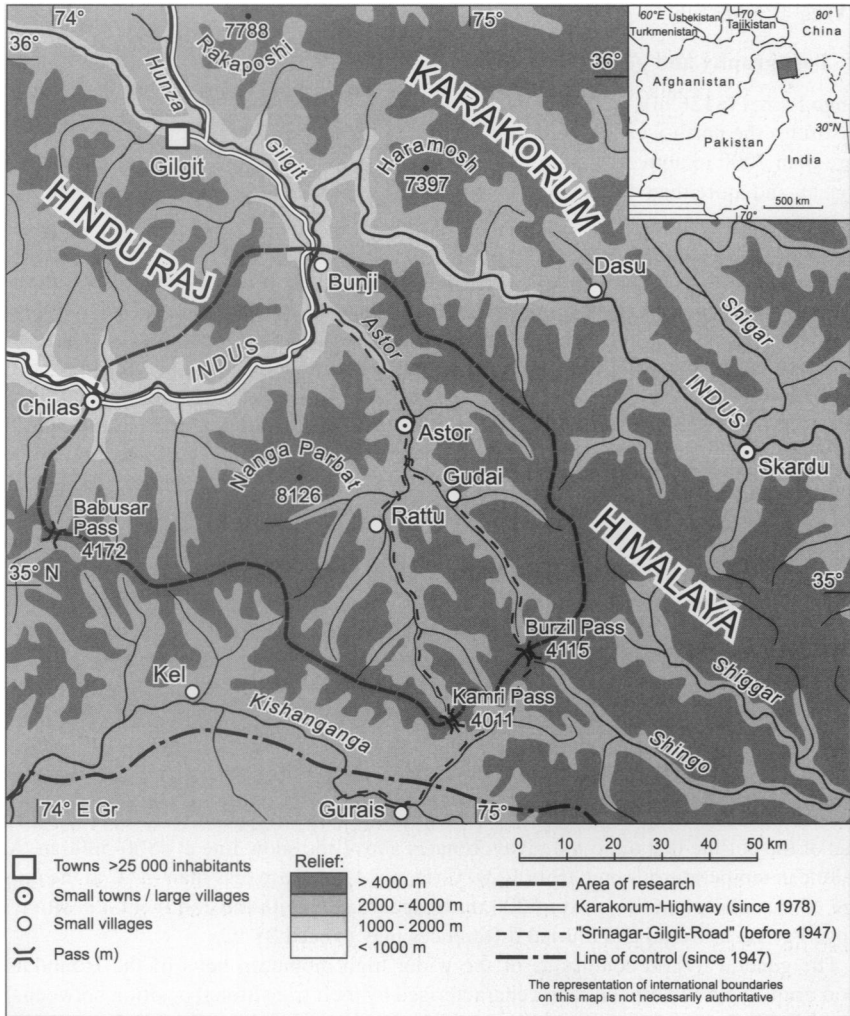


Fig. 2. Area of research.

The altitudinal variation of mean annual precipitation ranges between approximately 150 mm on the bottom of the respective section of the Indus Valley to about more than 2000 mm in the vicinity of the summit of Nanga Parbat (Weiers 1995).

3. Vegetation

3.1. Altitudinal zonation and topographical differentiation

The 1 : 50 000 vegetation map of the Nanga Parbat group by Troll (1939) shows the three-dimensional distribution of vegetation types in surprising accuracy; this has recently been demonstrated by satellite imagery (Nüsser & Schickhoff 1996). The following short description of altitudinal belts and vegetation types therefore adheres in general to Troll's nomenclature based on dominant species, while at the same time defining the vegetation belts more floristically. In the differentiation of the submontane/montane belts the present approach differs from the studies by Troll (1939) and Nüsser (1998).

Monographs and articles covering adjacent areas provide a basis for comparing the vegetation of the area under investigation to the Kaghan Valley (Schickhoff 1993, 1995a), Baltistan (Hartmann 1966, 1968, 1972) and Ladakh (Hartmann 1983, 1984, 1987, 1990, 1995). The map by Schweinfurth (1957) continues to be indispensable for a large-scale overview of the Himalayan vegetation. Additional information on vegetation characteristics of the Karakorum can be found in Paffen & al. (1956), Dickoré (1995) and Schickhoff (1995b, 1999). Braun (1996) presents an approach towards reconstructing the potential extent of moist coniferous forests in the NW Karakorum using remote sensing data.

The vegetation of Nanga Parbat is composed of deserts, steppes, steppe-forests, montane ("boreal") coniferous forests, subalpine birch and willow forests and scrub, and alpine dwarf-scrub, turf and cushions. The striking hypsozonal differentiation of the vegetation is a most prominent feature. At middle altitudes (c. 2700-3800 m), differences of exposure are obvious, with moist coniferous forest almost confined to the northern aspects, and dry juniper steppe-forests, tree-less *Artemisia* steppes or dwarf-scrub dominating on the southern slopes (Troll 1939, Schickhoff 1996a, Nüsser 1998). Due to the relatively high amount of winter snow and extensive avalanche trails at higher altitudes, the sharply delimited water-surplus habitats, further modify the altitudinal differentiation of the lower zones. "Azonal" habitats, such as morainic lakes (Rama Lake above Astor, Bazhin Lake and Tap Lake in Rupal valley), riversides, irrigated hay-meadows and cultivated fields, though insignificant in their surface areas, contribute significantly to the floristic diversity of the high mountain group.

While dependent largely also on aspect and microclimatic differentiation, general altitudinal ranges of the vegetation belts on Nanga Parbat may be defined as follows:

- colline belt 1100-2000 m
- submontane belt 2000-2700 m
- montane belt 2700-3400 m
- subalpine belt 3400-3900 m
- alpine belt 3900-4500 m
- subnival belt >4500 m

3.1.1. Colline belt

The dry and hot valley zone of the colline belt shows arid-subtropical conditions. Mean annual temperature ranges from 15-20 °C, while summer temperatures may often exceed 30 °C. Snow fall in winter is rare, and there is no long lasting snow-cover (Troll 1939). An-

nual precipitation ranges from well below 200 mm at the valley bottom (1100 m) to about 350 mm on the upper fringe at 2000 m.

Uniform desert or desert-steppe prevails in the colline belt (Fig. 3). The vegetation cover is generally very open, with the individual plants widely dispersed. A few species, mostly dwarf shrubs and semi-shrubs (*Capparis spinosa*, *Artemisia fragrans*, *Haplophyllum gilesii*, *Heliotropium dasycarpum*, *Stipagrostis plumosa*, *Tetrapogon villosus*) may become dominant. Although these (semi-)deserts habitually and floristically (*Ephedra przewalskyi*, *Arnebia guttata*) resemble Central Asiatic deserts, representatives of the sub-humid subhimalayan thorn-scrub (*Calotropis procera*, *Solanum surratense*, *Withania somnifera*) are also present. There is only slight pedological differentiation within the colline belt. Rocky slopes are dotted by small trees of *Pistacia khinjuk* and *Rumex hastatus* dominates on scree slopes. Sand accumulations on the valley ground are characterised by *Chesneya depressa* and a few other species. Oases along tributary streams and irrigation canals are usually small and sharply delimited. Groundwater-dependent wood and shrublands (*Tamarix ramosissima*, *Elaeagnus*) are now mostly under cultivation, with the occasional occurrence of widespread (sub-)tropical weeds (*Cleome*, *Paspalum*, *Adiantum capillus-veneris*).

The colline vegetation is best developed in the main flowering season from the end of May to the beginning of June, when a few therophytes give rise to a little extra green. A second flowering phase in autumn / winter is dominated by a few species of dwarf shrubs and semi-shrubs (*Heliotropium*, *Artemisia*), and late-season annuals (*Halogeton*, *Salsola*, *Chrozophora*).

Troll (1939) distinguishes the following units within the colline belt:

- 1: Desert-steppe without trees; plant cover of low shrubs, semi-shrubs, grasses and herbs: green and flowering in early summer, with a few exceptions. Range: valley bottom up to about 2000 m
- 2: Desert-steppe with sparse trees of *Pistacia [khinjuk]* on rocky slopes
- 3: Groundwater-vegetation of the dry and hot valley zone, with *Tamarix* and *Elaeagnus*, and spring water-vegetation.

3.1.2. Submontane belt

The submontane belt (2000-2700 m), as defined here by the potential presence of warm-temperate steppe-forests of *Quercus baloot* (1850-2690 m), *Juniperus semiglobosa* (1930-2740 m), *Pinus gerardiana* (2000-2950 m) and *Cedrus deodara* (2400-2750 m), is a most problematic subdivision (Fig. 4). All trees and many of their specific companions occur on the very northern edge of their distribution area, and occupy specific, narrow altitudinal zones. Towards the Karakorum, the submontane belt seems to vanish altogether. Additional difficulties ensue from the sharp altitudinal increase in species number, as well as the discordant floristic composition within the submontane belt. Physiognomically, there are at higher altitudes only slight differences to the *Artemisia brevifolia* steppes of the southern slopes, so that Troll (1939) and Nüsser (1998) were led to substantially different delimitations.

Mean annual precipitation in the submontane belt ranges from approximately 250 to 550 mm, temperature from 10-15 °C. Snow fall seems to occur regularly in winter, but does not produce a long-lasting cover. Due to the unfavourable climatic conditions with high



Fig. 3. Colline belt. Photo from Hattu Pir (Da/Bu, 3125 m) to SW down the Indus Valley (M. Nüsser, 1993-08-05). The bottom of the Indus Valley, approximately up to the upper edge of scree fans (light colour, foreground right and background left) holds a uniform (semi-) desert vegetation (*Artemisia fragrans*, *Heliotropium dasycarpum*, *Capparis spinosa*) typical for the colline belt. The irrigated area of the oasis Lichar (1330 m) is clearly discernible (middle). To the background right-hand the surrounding ridges of the Gor amphitheatre are to be seen, marking the distribution limit of submontane *Quercus* forest; montane open *Juniperus* steppe-forest covers the ridges.

amounts of snow above 2700 m, most permanent settlements are situated in the submontane belt (Troll 1939). This settlement pattern contributes locally to considerable degradation and disturbance of the vegetation cover, and to the prevalence of common weeds (*Verbascum thapsus*, *Artemisia siversiana*).

With regard to the life-forms of plants, the submontane belt appears to present a stronghold of therophytes (*Buchingera axillaris*, *Alyssum desertorum*, *Phleum himalaicum*) and geophytes (*Tulipa clusiana*, *Colchicum luteum*) corresponding to the relatively large amount of spring precipitation and high temperatures.

Relief and edaphical diversity bring about locally different floristic compositions within the submontane belt. Dwarf-scrub communities and open scrublands are widely distributed, with *Artemisia brevifolia*, *Kochia prostrata*, *Krascheninnikovia ceratoides*, often with *Daphne mucronata*, *Colutea paulsenii*, *Heteropappus altaicus*, or the "hedgehog cushions" of *Astragalus strobiliferus* on sand accumulations. *Hippophae rhamnoides* and *Calamagrostis pseudophragmites* may become dominant on riverside gravel. Small forest groves of *Fraxinus xanthoxylodes* occur among rocks, boulders and along water courses. The deeper gullies occasionally provide moist shaded habitats for hygrophilous species (*Aralia cachemirica*, *Swertia cordata*).



Fig. 4. Submontane belt. Photo from lower Astor road between Mushkin and Dashkin (Da, 2000 m) towards NE facing slopes above (M. Nüsser, 1992-10-10). The typical aspect of the drier slopes of the Lower Astor Valley is an intricate, aspect- and edaphically controlled mosaic of open steppe-forest or single trees (*Pinus gerardiana*, *Juniperus excelsa*, *J. semiglobosa*) with *Artemisia brevifolia* dwarf-scrub and dry open scree slopes.

Except for the amphitheatre of Gor, which is probably favoured by its exposure to the last traces of monsoonal precipitation, the more dense steppe-forest formations are confined to northern aspects. *Cedrus deodara* forest, though apparently without most of its typical Outer Himalayan companion flora (*Parrotiopsis jacquemontiana*, *Acer pentapomicum* etc.), is well developed in the Babusar Valley (2400-2750 m), but completely absent from the Nanga Parbat area NW of Bunar Valley (Schickhoff 1995b, 1996a).

Open *Quercus baloot* stands, mostly among cultivated fields, and highly transformed by the traditional utilisation for fodder-logging, are confined to the Gor region. The potentially characteristic companion vegetation (*Lespedeza juncea*, *Isodon rugosus*, *Cymbopogon jwarancusa*, *Tripogon purpurascens*) tends to be reduced to rare traces. *Rhamnella gilgitica*, one of the most localised endemics of the Nanga Parbat region (Indus Gorge), is apparently confined to the lower fringes of the *Quercus* belt (more widely distributed lower down the Indus Valley). *Rhamnella* appears to be particularly susceptible to grazing and occurs in dry rocky shrubberies, often together with the habitually similar *Sageretia thea*.

Pinus gerardiana forms steppe-forests, often together with *Juniperus excelsa* or *J. semiglobosa* and a variety of shrubby species, occurs rather on the upper fringes of the submontane belt and is relatively widely distributed. Although *Pinus gerardiana* does not seem to produce a moist interior forest microclimate, a characteristic companion flora

(*Astragalus bicuspidis*, *Caragana tragacanthoides*, *Onobrychis laxiflora*, *Androsace aizoon*, *Bupleurum canaliculatum*, and others) is developed.

According to Troll the following vegetation types are found in the submontane belt:

- 4: *Artemisia brevifolia* steppe with *Krascheninnikovia ceratoides* and *Kochia prostrata*: without trees [including in Troll's sense also typical *Artemisia brevifolia* dwarf scrub on south slopes of higher belts]
- 8: *Artemisia* steppe with sparse shrubs and trees of *Fraxinus xanthoxyloides* on talus fans
- 6: Transition from *Artemisia*-tree-steppe to xerophytic woodland, with *Pinus gerardiana* and *Juniperus semiglobosa*
- 7: Mixed xerophytic woodland with *Pinus gerardiana*, *Juniperus semiglobosa* [*J. excelsa* ?] and *Quercus baloot*
- 21: Cultivated land, irrigated crops, orchards and meadow strips.

3.1.3. Montane belt

The montane belt lies between c. 2700-3400 m and potentially accommodates dark boreal coniferous forests (Fig. 5). These, however, are usually confined to northern aspects or associated to glaciers, thus giving rise to isolated pockets separated by sharply contrasting dwarf scrub, steppe or steppe-forest communities on southerly exposed slopes. Schickhoff (1996a) maps the actual distribution of moist montane forests.

A substantial and long lasting snow-cover characterises the winter conditions at these altitudes, which may persist on average until May, with remains of avalanche snow remaining occasionally until July. Due to the absence of climatic stations at the higher altitudes only rough estimations of mean annual temperatures (5-10 °C) and precipitation (500 to 900 mm) in the montane belt can be made. There seems to be a pronounced maximum of winter and early spring precipitation in the form of snow. A more considerable monsoonal influence may be expected in the immediate neighbourhood of the southern passes. Much of the vegetation period in the montane belt is still semi-arid; however, rain and mist is fairly common.

Although the montane belt on Nanga Parbat is by far the richest in species number and potential differentiation of vegetation types, it is floristically depauperate as compared to the outer Himalayan slopes (Troll 1939). Only four species of conifers constitute the forest tree vegetation: *Pinus wallichiana*, *Picea smithiana*, *Abies pindrow* and *Juniperus semiglobosa*. The first is the most common and widely distributed forest tree. *Pinus wallichiana* forms pure stands, such as in the unusually low-lying areas of the lower Mushkin forest (< 2700 m; in exceptional cases down to 2200 m, Troll 1939). *Picea smithiana* is regularly admixed, sometimes dominating at the higher elevations and under generally moister conditions azonally around Nanga Parbat and above Gor. *Abies pindrow*, apparently with the highest hygric requirements, plays a considerable role in the Rupal Valley only and extends along the Astor face of Nanga Parbat to the upper Mushkin forest (Troll 1939). It is apparently completely absent from the Indus face of Nanga Parbat and accordingly known only from single trees in the SW Karakorum around Gilgit (Kar Gah, Naltar Valley, Rakaposhi N, Bagrot Valley) (Schickhoff 1995b, 1996a, b).

Within the montane belt many southerly exposed slopes hold, either naturally or



Fig. 5. Montane belt. Photo from the W facing slope of Raikot Valley (Ra, 3500 m) towards Fairy Meadows (M. Nüsser, 1994-06-07). Distant view of moist coniferous forests (*Pinus wallichiana*, *Picea smithiana*) with anthropo-zoogenous clearings (Fairy Meadows: centre, right). The slopes (background) show characteristic striking contrasts of aspect with conifers on N facing slopes and naturally open steppe-like vegetation (*Artemisia brevifolia*, *A. santolinifolia*). Avalanche trails (background) obscure the limits of forest distribution.

through forest degradation and destruction, tree-less *Artemisia brevifolia* dwarf scrub, or open *Juniperus semiglobosa* steppe-forest with a poor companion flora of drought resistant shrubs (*Rosa webbiana*, *Ribes orientale*, *Berberis orthobotrys*), steppe-grasses (*Piptatherum gracile*, *Poa sterilis*), dwarf shrubs and herbs (*Nepeta leucolaena*, *Campanula pallida*, *Leptorhabdos parviflora*, *Artemisia desertorum*, *Artemisia santolinifolia*, *Chorisporea sibirica*, *Cuscuta planiflora*, *Veronica biloba*).

The ground layer of dry pure *Pinus wallichiana* forests of the lower altitudes is widely dominated by a thin compost of dead pine needles. The companion flora of shrubs and herbs is relatively rich in species, but usually does not cover a larger proportion of the surface: *Androsace thomsonii*, *Arenaria neelgherrensis*, *Artemisia japonica*, *Astragalus candolleanus*, *A. peduncularis*, *Brachyactis pubescens*, *Bromus confinis*, *Erigeron acer*, *Fragaria nubicola*, *Galium boreale*, *Gentianella borealis*, *Geranium himalayense*, *Hieracium virosum*, *Impatiens brachycentra*, *Pennisetum lanatum*, *Piptatherum munroi*, *Pseudomertensia efornicata*, *Rubus irritans*, *Scorzonera virgata*, *Silene vulgaris*, *Solidago virgaurea*, *Saussurea chenopodiifolia*.

Moist areas by stream-sides are characterised by *Salix* shrubberies (*Salix wallichiana*, *S. sericocarpa*), occasionally with *Rosa macrophylla*, *Cotoneaster affinis* and the herbaceous species *Rubus saxatilis*, *Carex duthiei*, as well as others. Under generally more humid condi-

tions at higher altitudes, but also especially along rivulets, *Picea smithiana* and eventually *Abies pindrow* may dominate. The understorey contains hygrophilous shrubs and herbs (*Ribes nigrum*, *Codonopsis clematidea*, *Impatiens thomsonii*, *Orthilia secunda*, *Polygonatum geminiflorum*, *Ranunculus laetus*, *Lactuca rapunculoides*, *Bupleurum thomsonii*, *Jaeschkea oligosperma*), including a few ferns (*Cystopteris fragilis*, *Dryopteris xanthomelas*). Among the orchids of the moist coniferous forests we find *Epipactis helleborine*, *Goodyera repens* and, exceptionally rare, *Epipogium aphyllum*.

“Leaf-meadows” of *Bergenia stracheyi* may cover entirely steep N facing slopes towards the upper edge of coniferous forest. Besides avalanche trails with *Betula utilis* subsp. *jacquemontii*, tall forbs may form conspicuous aspects on moist clearings near the tree-line. The forb communities are particularly well developed and rich in species near Kalapani. This is probably due to the combined effects of increased summer precipitation moisture close to the southeastern passes and to forest destruction. Typical species are *Aconogonon alpinum*, *Podophyllum hexandrum*, *Lilium polyphyllum*, *Eremurus himalaicus* and many others.

Forest clearings at lower altitudes, unless irrigated, usually provide only dry short-grass pastures. Locally, as on Fairy Meadows, *Leontopodium campestre* and other herbs resistant to drought and grazing dominate. Irrigated hay meadows are quite productive, and abound in mesophilic and wetland species (*Poa pratensis*, *Trifolium repens*, *Achillea millefolium*, *Kobresia laxa*, *Juncus membranaceus*, *Pedicularis punctata*, *Poa pratensis* subsp. *pratensis*, *Festuca rubra* subsp. *rubra*, *Blysmus compressus*, *Carex orbicularis*).

Taxus wallichiana forest, at the N edge of its area of distribution, occurs exclusively in the Pattaro Valley from 3100-3200 m (Troll 1939, Nüsser 1998). *Viburnum cotinifolium* seems to be a characteristic companion shrub, apparently with a similar distribution.

Troll’s vegetation map differentiates the vegetation of the montane belt as follows:

- 5: *Artemisia brevifolia* steppe with sparse shrubs, *Juniperus semiglobosa* trees, and broadleaf shrubs (*Rosa*, *Daphne*, *Ribes*, *Cotoneaster*) [refers partly to the submontane belt]
- 9: Moist coniferous forest of *Pinus wallichiana* and *Picea smithiana*, with *Abies pindrow* in the southern part; mostly on shaded slopes from (2500-) 2800-3700 m
- 10: Moist coniferous forest of *Pinus wallichiana* and *Picea smithiana*, mixed with *Juniperus semiglobosa*
- 11: Moist coniferous forest (as No. 10), mixed with *Betula utilis*, alongside ravines and avalanche trails
- 18: Deciduous shrub and woodland with willows (*Salix sericocarpa*, *S. wallichiana*), poplars (*Populus caspica*, *P. ciliata*), *Lonicera*, *Cotoneaster*, *Viburnum*, *Euonymus*, *Hippophae*, *Myricaria*, etc. with an undergrowth of tall herbs at groundwater sites
- 20: Occurrences of *Taxus wallichiana* in the Pattaro Valley.

3.1.4. Subalpine belt

Mean annual precipitation in the subalpine belt is estimated to range from 750 to 1200 mm, temperature from 2-6 °C. The vegetation of the subalpine belt shows marked differences of aspect. Birch forest (*Betula utilis* subsp. *jacquemontii*, with *Sorbus tianschanica*, *Lonicera obovata*, *Bistorta vivipara*, *Pyrola rotundifolia* subsp. *karakoramica*, *Hieracium vulgatum*, *Viola biflora*) dominates on northern aspects and along avalanche trails (Fig. 6). A variety of tall herbs accompany these often low open forests or form aspects of their own on moist



Fig. 6. Subalpine belt. Photo from Upper Rupal Valley, S of Bazhin Glacier (Ru, 3570 m) looking towards E (M. Nüsser, 1992-10-13). Detailed aspect of a relatively low lying timber-line (*Pinus wallichiana*, background) in an avalanche trail with typical subalpine snow-deformed *Betula utilis* subsp. *jacquemontii* scrub with *Juniperus communis* subsp. *alpina* (foreground).

open scree and rock slopes (*Aconogonon alpinum*, *Epilobium angustifolium*, *Bergenia stracheyi*, *Hedysarum falconeri*, *Iris hookeriana*, *Geranium pratense* subsp. *stewartianum*, *Senecio tibeticus*). On moist meadow patches and rock-ledges by water, *Juncus himalensis*, *Lomatogonium carinthiacum*, *Swertia petiolata*, *Cardamine loxostemonoides* and many other hygrophilous species occur.

S facing slopes of the subalpine belt are covered with relatively dry steppe-meadows rich in species (*Agrostis vinealis*, *Koeleria cristata*, *Arabidopsis mollissima*, *Draba stenocarpa*, *Seseli libanotis*, *Saxifraga sibirica*, *Gagea elegans*, *Dianthus anatolicus*, *Astragalus rhizanthus*, *Viola rupestris*, *Leontopodium campestre*, *Thymus linearis*, *Nepeta discolor*, *Pseudomertensia echioides*, *Crepis multicaulis*). They are interspersed with single trees or small groves of *Juniperus semiglobosa* and *J. turkestanica*.

Dwarf scrub communities (*Juniperus communis* subsp. *alpina* and *J. squamata*) are also widely distributed and often closely interlaced with birch forests and meadows. The juniper dwarf shrub seems to dominate on ridges and other exposed areas subject to bare frost in winter or early spring. Various other forbs and dwarf shrubs (*Aconogonon tortuosum*, *Astragalus zanskarensis* and *Cicer microphyllum*) probably characterise edaphically dry or instable substrates and over-grazed slopes.

Troll's vegetation units reflect the difficulties of an altitudinal delimitation in the subalpine belt due to avalanche trails and other relief characteristics:

- 12: *Betula utilis* subsp. *jacquemontii* forest on shaded slopes above the moist coniferous forest from 3500-3900 m (in ravines and avalanche trails of the montane belt down to 2700 m)
- 16: Dwarf scrub of *Juniperus squamata* and *Juniperus communis* subsp. *alpina* predominantly on sunny slopes (subalpine to alpine)
- 17: Meadows with interspersed *Juniperus semiglobosa* and *Juniperus turkestanica* trees on sunny slopes up to 3900 (4200) m
- 19: Moist moss patches (*Aulacomnium*), fen turf (*Carex orbicularis*, *Eriophorum scheuchzeri* [Raikot], *Trichophorum pumilum*, *Kobresia royleana*) and dwarf scrub (*Salix caesia*) near springs and flushes.

3.1.5. Alpine belt

According to traditional definitions, including Troll's (1939), the alpine belt can be defined as the principally tree-less area above the upper limit of *Betula*. Since we distinguish a separate subnival belt, the altitudinal range of the alpine belt on Nanga Parbat is c. 3900-4500 m. Mean annual precipitation in the alpine belt of Nanga Parbat is estimated to range from 1000 to 1600 mm, and temperature from 2 to -3 °C.

The alpine vegetation of Nanga Parbat consists of an often small-scale mosaic of (dwarf) scrub, meadow, turf, open scree and rock vegetation types. The distribution of alpine plant communities is influenced by relief, exposure and edaphical features. Relief features restrict the surface area of alpine vegetation, and unstable scree or rock slopes may be virtually free of higher plants.

Scrub and dwarf scrub ("Krummholz") of *Salix karelinii*, attaining a height from 20 to 200 cm depending on conditions, cover large tracts on N facing slopes above the subalpine *Betula* forests and along valleys and avalanche trails. Humid conditions allow the accumulation of deep layers of forest humus, providing habitat for a variety of tall hygrophilous forbs (*Aconogonon rumicifolium*, *Doronicum falconeri*, *Gentiana tianschanica*, *Geranium pratense* subsp. *stewartianum*), some of which are perhaps more characteristic to the subalpine belt, as well as a companion flora of smaller herbs (*Gentiana marginata*, *Hierochloa laxa*, *Vicatia wolffiana*, *Festuca rubra* subsp. *arctica*, *Sibbaldia cuneata*, *Pedicularis pectinata*).

Rhododendron anthopogon is also more or less confined to the northern aspects, though possibly dependent rather on the edaphically drier and more level conditions. These dwarf shrubberies (30-60 cm in height), provide enough shelter for alpine herbs and dwarf shrubs (*Trollius acaulis*, *Thalictrum alpinum*, *Carex stenocarpa*, rarely *Cassiope fastigiata*).

Relatively large areas are covered by alpine turf or mats, usually dominated by *Kobresia capillifolia* (sometimes *K. nitens*, *K. schoenoides*), and abound in companion species (*Saussurea falconeri*, *Cerastium cerastioides*, *Potentilla venusta*, *Carex stenocarpa*, *Androsace mucronifolia*, *Papaver nudicaule*, *Poa attenuata*, *Rhodiola fastigiata*, *Anaphalis nubigena*, *Saxifraga flagellaris* subsp. *crassiflagellata*, *Myosotis asiatica*, *Erigeron multiradiatus*, *Draba lanceolata*, *Eritrichium villosum*, *Androsace septentrionalis*, *Oxytropis lapponica*, *Ranunculus karakoramicola*, *Leontopodium leontopodium*, *Pulsatilla wallichiana*, *Thlaspi cochleariforme*, *Chorispora sabulosa*, *Erigeron uniflorus*). In accordance with exposure, humidity conditions and grazing intensity, many of these and other



Fig. 7. Alpine belt. Photo at Upper Mazeno Base Camp (Ru, 4320 m, M. Nüsser, 1994-07-18) showing a detailed aspect of alpine turf and open forb communities on an edaphically dry S slope with gneiss boulders, comparatively little grazed. *Rhodiola fastigiata*, *Silene moorcroftiana*, *Oxytropis tatarica*, *Koeleria cristata* are most conspicuous. Additional species collected on the spot include *Kobresia capillifolia*, *K. schoenoides*, *K. karakorumensis*, *Festuca rubra* subsp. *arctica*, *Potentilla venusta*, *Geranium pratense* subsp. *stewartianum*, *Taraxacum himalaicum*, *Cerastium cerastioides*, *Pedicularis pectinata*, *Bistorta affinis*, *Aconogonon tortuosum*, *Saxifraga flagellaris* subsp. *crassiflagellata*, *Astragalus rhizanthus*, *Tanacetum senecionis*, *Nepeta discolor*, *Leontopodium leontopodium*, *Eritrichium villosum*, *Erigeron multiradiatus*, *Pulsatilla wallichiana*, *Gentiana tianschanica*, *Thymus linearis*, *Dianthus anatolicus*, *Saussurea falconeri* and *Draba lanceolata*.

species may form aspects of their own. A special association of “snow valleys” (*Salix flabellaris*, *Primula reptans*), reminiscent of a typical feature of humid alpine mountains, is confined to permanently moist situations with long lasting snow-cover along avalanche trails.

Edaphically dry or intensively grazed slopes are usually covered with more open “meadow-steppes” (Fig. 7), where chamaephytes (*Ephedra gerardiana*, *Bistorta affinis*, *Rhodiola fastigiata*, *Thymus linearis*) and drought-resistant herbs (*Elymus canaliculatus*, *Oxytropis tatarica*, *Tanacetum senecionis*, *Silene moorcroftiana*) dominate. Juniper patches (*Juniperus squamata*, *J. communis* subsp. *alpina*) may also extend into the alpine belt on southern aspects.

More or less specialised open plant communities typical for scree slopes (*Waldheimia tomentosa*, *W. tridactylites*) and rock-crevices (*Saxifraga imbricata*) intervene between the favourable habitat zones and the larger tracts of alpine desert along unstable slopes, or along fresh moraines and glaciers.

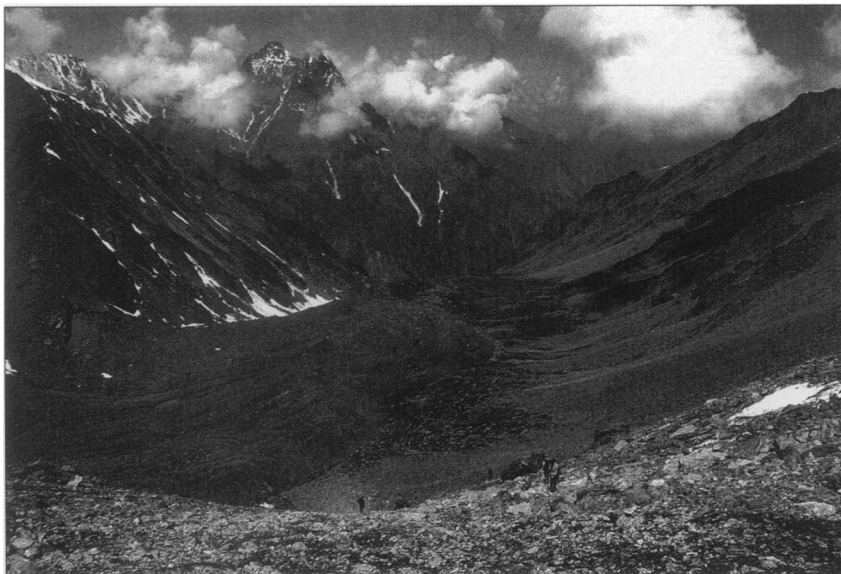


Fig. 8. Subnival belt. View of Upper Pattaro Valley (Pa, 4750 m, M. Nüsser, 1994-07-09) towards W showing turf fragments and open gelifluction slopes with *Primula macrophylla*, *Carex nivalis* (foreground). Moist turf of the alpine belt (*Kobresia nitens*, *Carex stenocarpa*) fringes the lateral moraines of the scree-covered Pattaro Glacier at Guttum Sagar (centre, c. 4200-4500 m).

Troll (1939) maps the alpine vegetation as follows:

- 13: Open alpine (subalpine to subnival) grassland, meadows, turf and dwarf scrub, gradually fading out towards higher altitudes (alpine desert)
- 14: Moist *Salix karelinii* scrub, mostly on shaded slopes
- 15: Moist *Rhododendron anthopogon* (dwarf) scrub on shaded slopes, mostly mixed with No. 14.

3.1.6. Subnival belt

The subnival belt may be defined as at least periodically snow-free areas of rock and scree, colonised incidentally by scattered plant individuals or associations, including smaller turf patches (Fig. 8). Due to the steep relief, the surface area of this belt above 4500 m on Nanga Parbat is relatively small. Therefore, some of the species thought of as characteristic to the highest elevations of the free gelifluction belt (*Carex nivalis*, *Saussurea gnaphalodes*, *Primula macrophylla*, *P. elliptica*, *Epilobium latifolium*, *Schulzia dissecta*, *Luzula spicata*, *Corydalis gortschakovii*, *Pseudomertensia primuloides*) may prove to be of a more general alpine distribution. However, on an extended geographical scale encompassing the Inner Himalayas, Karakorum and Tibet, large areas between the upper limit of closed alpine vegetation and the snow-line seem to contain a distinctive subnival species inventory.

Mean annual precipitation in the subnival belt ranges approximately from 1400 to 2000 mm, with temperature usually below -3°C ; the surface temperatures, however, where phanerogamic plants occur may be substantially higher.

Troll (1939) shows the:

22: Upper limit of the regular occurrence of vascular plants (line drawn approximately between 4900 and 5200 m on the basis of few samples only).

3.2. Land use system

3.2.1. Agriculture and animal husbandry

The regional land use system in the whole mountainous area of northern Pakistan can be described as an integrated agro-pastoral system, relying on a combination of agriculture, animal husbandry and forest utilisation (Kreutzmann 1989, Nüsser 1998). Agriculture is entirely dependent on the availability of glacial and snow melt water for artificial irrigation. Maize (up to 2700-2900 m), wheat (up to 3100 m) and barley (up to 3350 m) are the most common crops. The upper limit of double cropping can be marked at an altitude of approximately 2000 m (Nüsser & Clemens 1996). Small scale cultivation of fruit trees, mulberry (*Morus alba*), apricot (*Prunus armenica*), walnut (*Juglans regia*), as well as a few more, is limited to the colline and lower submontane belts.

Livestock keeping depends on high pasturing during the summer months, accompanied by the utilisation of all available fodder sources for stall-feeding during the long lasting winter period. Fodder shortages in winter and spring are the major limiting factors in animal husbandry. Herd size is thus dependent on the fodder availability during the cold season. A symbiotic relationship characterising the link between the spheres of livestock rearing and crop cultivation endures up to the present day. Whereas the availability of manure and animals drought power is necessary for the replenishment and tillage of the fields, the straw and crop residues constitute an important fodder after the harvest season. Apart from these interdependent relations among the principal components of land use, the agro-pastoral system requires a detailed temporal organisation of herd movements in order to utilise the resources of the different altitudinal belts (Nüsser 1998). Thus, the system of mixed mountain agriculture (Kreutzmann 1989, 1993) is based on a vertical zonation of land-use with permanent settlements in the colline and submontane belts, and seasonally inhabited settlements (indigenously called *Nirril* or *Rung*) in the upper valley zones. Whereas the majority of summer field settlements, characterised by supplementary irrigated agriculture, are located in clearings within the montane coniferous forests, the pasture settlements, solely concentrating on pastoral utilisation, are mostly to be found in the subalpine belt (Troll 1973, Nüsser 1998).

3.2.2. Altitudinal and regional variation

The given spatial distribution of pasture resources dictates the seasonal and vertical patterns of pastoral migrations in the Nanga Parbat area. These agro-pastoral migrations as well as the complexity of land use patterns vary from valley to valley, in accordance with the vertical

range and local vegetation resources. Pastoral mobility, extending across the different altitudinal belts assures the mountain farmers' subsistence and helps in coping with agrarian risks.

Climatic conditions, such as the duration of snow cover on different pastures, the onset and length of the vegetation period or the dry conditions in the valley bottoms of the colline belt, determine the potentials and limitations of the agro-pastoral economy from the ecological point of view. As the valleys have different ecological conditions due to their altitudinal position, individual mobility patterns may be identified. To varying degrees, all valleys experience fodder shortages during the long winter season. Therefore, different strategies of coping with this main problem of livestock rearing have evolved.

In the Raikot valley as well as in the Gor region on the opposite bank of the Indus river, animal husbandry is possible in the framework of all-year-round pasturing (Nüsser 1998). The access to snow-free winter pastures in the colline belt of the Indus valley allows a reduction in stall-feeding for cattle and sheep only. As the insufficient hay production does not allow the stall-feeding of all animals, the large goat herds are pastured by shepherds on the scarce vegetation of the Indus valley during winter. The numbers of goats per capita are significantly higher on the northern declivity of Nanga Parbat (approximately 25-40 per house), as compared to the situation in the higher tributaries, e.g. in Rupal Gah (10-12 per house). Yak cross-breeds (*Zomo/Zoi*) are not kept on the Indus face of Nanga Parbat because of their particular sensitiveness against the higher average temperatures, and horses are rarely kept due to specific fodder problems (Clemens & Nüsser 2000).

Rupal valley, towards the south of Nanga Parbat, is a single cropping area with wheat as the most important crop, followed by maize and potatoes. In comparison, barley is grown up to the highest limits of grain cultivation (up to 3340 m) due to its short ripening period, and maize is cultivated up to approximately 2750 m. Crop residues and wild hay (*Trifolium pratense*, *T. repens*, *Poa pratensis*) form the major fodder source for the livestock winter supplies. The economic importance of animal husbandry gives rise to a selection of grain-crop varieties marked by a preference for high straw yields to meet the animals' fodder requirements, supplemented by the cultivation of lucerne (*Medicago sativa*, *M. xvaria*) in a few isolated patches.

The dominant cultivated crop in Raikot valley is maize grown up to approximately 2500 m. In the neighbouring Buldar valley, maize reaches its highest limit at 2910 m. In the summer settlements of Raikot valley wheat and barley are additionally cultivated up to 3300 m. Due to the proximity to the area of double cropping in the colline belt of the Indus valley, the majority of households in the Raikot valley also cultivate land. Double cropping of winter wheat and maize ensures the people's food supplies together with higher amounts of crop residues for winter fodder. The stage-wise land use of high pasturing in the Raikot valley covers an amplitude of approximately 1200 m from the village of Tato to the highest grazing settlements. In winter, most of the families descend with their animals down to the Indus valley to an altitude of approximately 1150 m. The total pastoral amplitude thus is to more than 2350 m (Nüsser 1998, Clemens & Nüsser 2000).

3.2.3. Medicinal plants

The Nanga Parbat area is renowned as a realm of traditional medicinal plants (Kazmi & Siddiqui 1953). Now almost abandoned in favour of industrial products, *Artemisia brevi-*

folia was harvested and exported to the down countries for its santonin content until the 1950s (Siddiqui 1953, Qazilbash 1954). A vivid knowledge and interest in traditional medicines persists not only in the rural societies of Pakistan; existing markets for wild economic plants could contribute locally to the household income (Hansen 1996). Among others, species of (potential) economic significance are *Podophyllum hexandrum*, *Saussurea costus*, *Aconitum heterophyllum*, *Hyoscyamus niger*, *Bunium persicum*, *Ferula narthex*, *Dactylorhiza hatagirea*. Further useful wild species are *Carum carvi*, used as a spice, and the peculiar *Megacarpaea* spp., used as vegetable.

4. Plan of the Flora

4.1. Brief history of botanical exploration

The botanical exploration of the high mountain region between the Himalayas, Karakorum and Hindukush was described by Stewart (1967, 1982). Later Kick (1996) gave a useful account of the general history of exploration, including valuable details of A. Schlagintweit's mission in 1856.

H. Falconer in 1838 was the first botanical collector in the Nanga Parbat massif; the following list gives the names of those collectors which appear more frequently in the material used for the present flora: H. Falconer 1838, J. E. Winterbottom 1847, A. Schlagintweit 1856, C. B. Clarke 1876, C. B. Tanner 1880, G. M. Giles 1885, 1886, J. F. Duthie 1892, 1893, W. M. Conway 1893, Inayat Khan 1901, B. O. Coventry 1921, W. Koelz 1936, C. Troll 1937, R. R. Stewart 1939, 1940, R. R. & I. S. Stewart & E. Nasir 1946, I. I. Chaudhri 1950, A. H. Khan 1950, M. A. Kazmi, I. A. Siddiqi & Y. Nasir 1952, F. Schmid 1954, E. Nasir & G. L. Webster 1955, M. B. Zaman 1957, T. E. Lankester & T. A. Pearson 1967, Azim & Shaheed 1971, S. Abedin & M. Qaiser 1971, G. & S. Miede 1990, T. Peer 1990, R. Hansen 1992, U. Schickhoff 1992, 1993, 1994, M. Nüsser 1993, 1994, W. B. Dickoré 1995.

This list is no doubt incomplete, while also including some collector who definitely only skirted the borders of the area (e.g. Clarke, Koelz) on the Kamri or Burzil passes. Sometimes the material was collectively labelled, so that often definite locations cannot be given (e.g. for Falconer). The early collectors have published little on the flora of Nanga Parbat and on their field trips, with the notable exception of Duthie (1893, 1894). Conway's report (1894) contains some information on the vegetation.

The early collectors were almost entirely confined to the immediate environs of the transit route from Kashmir, following the main Astor valley along the traditional Gilgit Road via the Burzil or Kamri Passes (for Giles' route see Lockhart & Woodthorpe 1889), occasionally also crossing to Skardu via the Deosai Plateau (Fig. 2). After the partition of British India in 1947, escalating conflicts between Pakistan and India blocked this route. Areas close to the "line of control" towards the SE of the massif, adjacent to the Upper Kishenganga Valley (Pakistan, Azad Kashmir / India, Jammu & Kashmir), became almost impossible to visit for civil persons. The access to Gilgit and Astor from the lowlands of Pakistan across the Babuser Pass, extremely difficult in the times referred to, has been opened since 1978 thanks to the opening of the Karakorum Highway along the Indus valley (Fig. 2).

However, access and transport to the rugged terrain of Nanga Parbat is still long, difficult and, at times, dangerous or even impossible: not surprisingly few managed to survey the remoter and higher slopes. It seems that so far the records and collections of Troll and Nüsser form almost exclusively the basis for our knowledge of the alpine flora of Nanga Parbat, especially of the Indus face. Schickhoff concentrated on the flora of the montane forest, covering also the remote Diامر valley.

4.2. Delimitation and division, abbreviations

The Flora covers the area marked in Fig. 2, corresponding to the massif of Nanga Parbat, including the slopes north of the Indus Gorge (Gor), but excluding the valleys draining to the

Tab. 1. Divisions and subareas of Nanga Parbat.

Chilas		Astor			
Go	Gor	Da	Dashkin	Astor/Kasmir	(Kamri P.)
Pa	Pattaro	As	Astor	Astor/Deosai	(Burzil P.)
Ra	Raikot	Ru	Rupal	Astor/Skardu	(Alampi P.)
Bu	Buldar	Ka	Kalapani		

Kishenganga in the South (Azad Kashmir). The area may be subdivided into the northwest flanks (Chilas) comprising the valleys draining to the Indus and the southeast flanks of the intramontane Astor basin (Astor). Further arbitrary subdivisions following major tributary basins have been defined for the valleys of the Nanga Parbat massif (Fig. 9), based on the topographical map (1 : 50 000) of the German Himalayan Expedition in 1934 (Finsterwalder 1938). The limits of the individual subareas (Tab. 1) serve only to locate plant records and are not to be interpreted as phytogeographical boundaries. For adjacent areas see Dickoré (1995).

The framework of the following list is provided by the "Annotated Catalogue of the vascular plants of West Pakistan" (Stewart 1972) and by the "Flora of (West) Pakistan" (Nasir & Ali 1970-), with the nomenclature deliberately adhered to the latter, as far as published, or to related floras and monographs. The following annotated enumeration does not claim any sort of completeness or consistency, as it was impossible to consult all the relevant herbarium material. The total number of specimens available still forms an inadequate basis of a Nanga Parbat flora. Insufficiently documented records form a major problem, especially due to the loss of Troll's herbarium. His unpublished records are, however, included, since they form the basis for the most comprehensive vegetation map of a Himalayan massif ever published. Furthermore, it was the authors' intention to discuss the potential floristic inventory of Nanga Parbat and to pin-point taxonomic problems calling for further research.

The factual basis of this Flora consists of the following elements:

- (1) Herbarium specimens studied, e.g. *Nüsser 1444* (B!) stands for the specimen *Nüsser 1444* kept at B and studied by the authors; specimens followed by an exclamation mark in parenthesis, but without herbarium acronym are kept in private collections, which have been temporarily deposited at GOET.
- (2) Field observations not correlated with herbarium specimens, e.g. 'Gor, 2400-2820 (*Dickoré*)' stands for a specimen observed by Dickoré in the field.
- (3) General records from the literature, which are always followed by the reference in parenthesis.
- (4) Records of specimens cited in the literature; they are followed by the herbarium acronym, but as a rule have not been studied by the authors.
- (5) Records from unpublished sources, notably by C. Troll; e.g. *Troll 7734* stands for a record in Troll's or Melchior's manuscript notes, now no more correlated with a herbarium specimen.

Whether or not and under which interpretation or status literature records have been included, solely reflects the view or (eventually lack of) experience of the first author. Selected

Tab. 2. Abbreviations.

Afgh.	Afghanistan
alp.	alpine belt
Baluch.	Baluchistan, Balochistan
C.	Central
C AS	Central Asiatic element
Cat. Pak.	Stewart 1972: Flora of West Pakistan. Annotated Catalogue
cf.	confer, approaching, similar to
ch	chamaephyte (dwarf shrub)
CIRCPOL	circumpolar (holarctic) element
coll.	colline belt
COSMO	cosmopolitan element
e	English name
ENDEM	endemic element
EURAS	Eurasian element
Fl. Karak. 1	Dickoré 1995: Flora Karakorumensis 1: Monocotyledoneae
Fl. Pak.	Nasir & Ali 1970: Flora of (West) Pakistan
ge	geophyte (herb with underground innovation)
Gl.	Glacier
he	hemicyptophyte (herb with near surface innovation)
HIMAL	Sino-Himalayan element
IRAN	Irano-Turanian element
KKH	Karakorum Highway
MEDIT	Mediterranean element
mont.	montane belt
np	nanophanerophyte (shrub)
P.	Pass (Gali)
ph	phanerophyte (tree)
RH	rest house
sh	Shina name
subalp.	subalpine belt
submont.	submontane belt
subniv.	subnival / upper alpine belt
SUBTROP	(sub-)tropical element (Africa, Asia) or marginal pantropical
th	therophyte (annual or biennial herb)
TIBET	Tibetan element
u	Urdu name
veg.	vegetative specimen
<	below (of)
>	above (of)
!	specimen seen
●	(predominantly) cultivated species
[*]	doubtful or improbable record

Taxa of doubtful origin, cultivated species and hybrids are excluded from subsequent evaluations; doubtful records are given in square brackets.

Data on life-form and phytogeography are greatly simplified and adapted for analytical requirement. Due to the lack of chorological details, the definition of phytogeographical elements is often provisional, with the focus rather on the geographical concentration than on distribution areas.

English plant names have been extracted from Stace (1991), Urdu plant names from "Flora of Pakistan", with some additions from various other sources in both cases. Vernacular plant names in Shina, the language commonly spoken in the Nanga Parbat region, were collected by the authors in the field. The abbreviation (e) stands for English, (sh) for Shina, (u) for Urdu.

5. Flora of Nanga Parbat

Pteridophyta

Lycopodiaceae

Huperzia selago (L.) Bernh. ex Schrank & Mart. (*Lycopodium selago* L.) / Fir Clubmoss (e)
 CHILAS: Ra: Kosto Valley, 4150 m, *Nüsser 1444* (B!); 4150 m, *Nüsser 1445* (B!); 4400 m, *Troll 7734* (“cf. *Lycopodium*”).
 4150-4400 m / alp.: dwarf scrub (*Rhododendron anthopogon*) / Europe, Asia, N America / CIRCPOL / ch.

Selaginellaceae

Selaginella jacquemontii Spring (*S. sanguinolenta* auct., non (L.) Spring)
 CHILAS: Go: Gor > NW, 2770 m, *Dickoré 12584* (!); Gor, Terimal, 2600-2700 m, *Troll 7125* (“*S. borealis*”).
 2600-2770 m / submont.-mont.: forest, moist rocks (*Pinus gerardiana*) / W Himalaya / W HIM / ch.

Equisetaceae

Equisetum arvense L. / Field Horsetail (e)
 ASTOR: Da: Harchu Valley, Lathang, 2600 m, *Nüsser 822* (B!); Mushkin RH <, 2580 m, *Dickoré 12735* (!). – Ru: Rupal Valley, Nahake – Gageh, 3000 m, *Nüsser 774* (B!); Tarishing, 2910 m, *Nüsser 748* (B!). – Ka: Faqirkot, 2800 m, *Schickhoff 1371* (det. Fraser-Jenkins).
 2580-3000 m / submont.-mont.: forest, riverside (*Pinus wallichiana*, *Salix wallichiana*) / Europe, Asia, N America / CIRCPOL / ge.

Equisetum ramosissimum Desf. / Branched Horsetail (e)

ASTOR: Ru: Latobo, 3600 m, *Nüsser 30* (B!).
 3600 m / subalp. / Africa, Europe, Asia, N & Central America / EURAS / ge.

Ophioglossaceae

Botrychium lunaria (L.) Swartz / Moonwort (e)

CHILAS: Go: Gor, 3520 m, *Schickhoff 1483* (det. Fraser-Jenkins). – Ra: Raikot Valley, 3560 m, *Schickhoff 1650* (det. Fraser-Jenkins).
 3520-3560 m / subalp.: dwarf scrub, forest, scrub (*Betula*, *Rhododendron anthopogon*) / Europe, Asia, N America / CIRCPOL / ge.

Adiantaceae (incl. *Sinopteridaceae*)

Adiantum capillus-veneris L. / Maidenhair Fern (e)

CHILAS: Chilas – Babusar, 1450 m (*Dickoré*). – Go: Thelichi, 1260 m, *Dickoré 12509* (!). – Ra: Jalipur, 1200 m, *Troll 7181*.

1200-1450 m / coll.: moist, rocks, semi-desert / Africa, S Europe, SW & SE Asia, S America / SUBTROP / he.

Cheilanthes acrostica Todaro

CHILAS: Go: Darang >, 1550 m, *Dickoré 12685* (!); Thelichi – Gor Gali, 2000 m, *Troll 7099* (“*C. pteridioides*”).

1550-2000 m / coll.-submont.: rocks, semi-desert (*Heliotropium dasycarpum*, *Stipagrostis plumosa*) / Acores, Mediterranean, N Africa, SW Asia / MEDIT / he.

Cheilanthes persica (Bory) Mett. ex Kuhn / godoniorabat (sh)

CHILAS: Go: Thelichi – Gor Gali, 2000 m, *Troll 7098*. — ASTOR: Da: Doian, 2400-3000 m, *Troll 7210*.

2000-3000 m / submont.-mont.: rock, steppe (*Artemisia brevifolia*) / SE Europe, SW Asia, W Himalaya / IRAN / he.

Aspleniaceae

Asplenium ceterach L. (*Ceterach officinarum* Willd.) / Rustyback (e)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1762* (det. Fraser-Jenkins). – Go: Gor, Terimal, 2400-2700 m, *Troll 7126*. — ASTOR: Da: Mushkin Forest, 2440-2740 m, 1892-08-15, *Duthie* (CAL, DD, Fraser-Jenkins in litt.).

2400-2750 m / submont.-mont.: forest (*Cedrus*) / N Africa, W, S & C. Europe, SW & Middle Asia / EURAS / he.

[*Asplenium dalhousiae* Hook. (*Ceterach dalhousiae* (Hook.) C. Christ)]

ASTOR: (Cat. Pak.).

coll. / E Africa, Himalaya / SUBTROP / he.

Record probably based on misidentified specimens of *A. ceterach* collected by Duthie. *A. dalhousiae*, however, is likely to be found at the lowest altitudes of the area, and is known also from Gilgit (Jutial !).

Asplenium fontanum subsp. *pseudofontanum* (Koss.) Reichst. & Schneller / tshar (sh)

CHILAS: Go: Gor, 2500 m, *Troll 7150*; 2500 m, *Troll 7152*; Gor, Chamuri, 3200 m, *Troll 7147*.

2500-3200 m / submont.-mont.: moist rocks, forest (*Picea*, *Pinus gerardiana*) / Tian Shan, Pamir, W Himalaya: E Afgh. – Nepal (species: SW Europe) / PAMIR / he.

Asplenium ramosum L. (*A. viride* Hudson) / Green Spleenwort (e)

ASTOR: Ka: Kamri Valley, Kalapani nr., 3050-3350 m, 1892-08-25, *Duthie 12552* (DD, CAL, K, Fraser-Jenkins in litt.); *Duthie 11612* (DD, Fraser-Jenkins in litt.). — ASTOR/KASHMIR: Kamri P., R. R. Stewart (Cat. Pak.); 3960 m, 1946-07-14, R. R. Stewart 22654 (K, Fraser-Jenkins in litt.); 1939-08-18, R. R. Stewart 18712 (KUH, RAW, Fraser-Jenkins in litt.); 1939-08-18, R. R. Stewart (KYO).

3050-3960 m / mont.-subalp. / Europe, Asia, N America / CIRCPOLE / he.

Asplenium septentrionale (L.) Hoffm. / Northern Spleenwort (e)

CHILAS: Go: Gor, 2690 m, *Schickhoff 1576* (subsp. *caucasicum*, det. Fraser-Jenkins); Gor > NW, 2600 m, *Dickoré 12577* (!, subsp. *caucasicum*, det. Fraser-Jenkins); Gor, Chamuri, 3000-3500 m, *Troll 7137*; Gor, Terimal, 2700 m, *Troll 7124*. — ASTOR: Da: Doian, 2400-3000 m, *Troll 7211*; Mushkin Forest, *Duthie* (Cat. Pak.); 2440-2740 m, *Duthie*, 1892-08-15 (K, subsp. *septentrionale*, Fraser-Jenkins in litt.); 3050-3350 m, 1892-08-14, *Duthie* (DD, subsp. *septentrionale*, Fraser-Jenkins in litt.). — As: Rama, *R. R. Stewart 22900b* (Cat. Pak.).

2400-3500 m / submont.-subalp.: rock, steppe, steppe-forest (*Artemisia brevifolia*, *Pinus gerardiana*, *Quercus*) / Europe, Asia, N America / CIRCPOl / he.

Both subsp. *septentrionale* (tetraploid) and subsp. *caucasicum* Lovis & Fraser-Jenkins occur in Pakistan (Fraser-Jenkins in litt.).

Asplenium trichomanes L. / Maidenhair Spleenwort (e)

CHILAS: Babusar Valley, 3200 m, *Schickhoff 1702* (subsp. *trichomanes*, det. Fraser-Jenkins). — Go: Gor, 2500 m, *Troll 7153*; Gor, Terimal, 2700 m, *Troll 7122*.

2500-3200 m / submont.-mont.: moist, forest, rock, steppe-forest (*Pinus gerardiana*, *Pinus wallichiana*) / Europe, Asia, N America / CIRCPOl / he.

Mostly as subsp. *quadrivalens* in Pakistan, also some (rather rare) subsp. *trichomanes*; subsp. *inexpectatum* (“*inexpectans*”) found only once in the Nilam Valley in Azad Kashmir (Fraser-Jenkins in litt.).

Dryopteridaceae***Dryopteris blanfordii*** (C. Hope) C. Chr. subsp. *blanfordii*

CHILAS: Go: Gor, 3230 m, *Schickhoff 1528b* (det. Fraser-Jenkins). — ASTOR/DEOSAI: Burzil P., 1946-08-01, *R. R. Stewart 22063a* (RAW, Fraser-Jenkins 1989, Fraser-Jenkins in litt.).

3230 m / mont.: forest (*Picea*, *Pinus wallichiana*) / W Himalaya: E Afgh. – Kumaon / W HIM / he.

Dryopteris filix-mas (L.) Schott / Male-fern (e)

ASTOR/DEOSAI: Burzil Chowki, 3200 m, *R. R. Stewart 19782* (PE, Fraser-Jenkins 1989).

3200 m / mont. / Europe, Asia, N America / CIRCPOl / he.

Dryopteris komarovii Koss. (*D. barbiger* subsp. *komarovii* (Koss.) Fraser-Jenkins)

ASTOR/KASHMIR: Kamri P., *R. R. & I. D. Stewart 18715* (CAL, E, RAW, Fraser-Jenkins 1989, Fraser-Jenkins in litt.); 1939-08-18, *R. R. Stewart* (RAW, Fraser-Jenkins 1989).

Tian Shan, Pamir, Himalaya, W China; Taiwan / HIMAL / he.

Dryopteris ramosa (C. Hope) C. Chr.

ASTOR/DEOSAI: Burzil Chowki, 3350 m, *R. R. Stewart 19133* (CAL, RAW, Fraser-Jenkins 1989).

3350 m / mont. / W Himalaya: E Afgh. – Nepal / W HIM / he.

[*Dryopteris villarii* (Bellardi) Woyнар ex Schinz & Thell. (*D. rigida* (Swartz) A. Gray)]

ASTOR: Ka: Kalapani Valley, 3300 m, *Troll 8028* (“*D. rigida*”)

3300 m / mont. / he.

Of unknown identity, according to Fraser-Jenkins (in litt.) the name of the (only) European species misapplied by R. R. Stewart to a mixture of the closely related *D. nigropaleacea* and *D. stewartii*, and sometimes also a small *D. ramosa*.

Dryopteris xanthomelas (Christ) C. Chr. (*D. pulcherrima* Ching, *Neprodium filix-mas* var. *fibrillosa* C. B. Clarke)

ASTOR: Da: Mushkin RH > SE, 2700 m, *Dickoré 12768* (!); 2800 m, *Dickoré 12797* (! det. Fraser-Jenkins).

2700-2800 m / mont.: forest, moist (*Abies*, *Pinus wallichiana*) / Himalaya: Swat – Bhutan, SE Tibet, W China / HIMAL / he.

“*Dickoré 12797* looks suspiciously like *Dryopteris edwardsii* Fraser-Jenkins, though might also be *D. xanthomelas*, as stated” (Fraser-Jenkins in litt.).

Polystichum lachenense (Hook.) Bedd.

CHILAS: Go: Gor, 4570 m, 1880-09, *Tanner 306* (DD, K, Fraser-Jenkins in litt.); Gor, *Tanner* (Cat. Pak.).

4570 m / alp. / Himalaya, S & E Tibet / HIMAL / he.

Polystichum woodsioides Christ

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12635* (!).

2950 m / mont.: forest, moist, rock (*Picea*, *Pinus wallichiana*) / W Himalaya / W HIM / he.

Identification not quite certain, may also have been *P. shensiense* (Fraser-Jenkins in litt.).

Polypodiaceae

Lepisorus clathratus (C. B. Clarke) Ching (*Polypodium clathratum* C. B. Clarke)

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12639* (!). – Bu: Buldar Gl., 3200 m, *Troll 7860*.

— ASTOR/KASHMIR: Kamri, 3050 m, 1946-07-13, *R. R. & I. D. Stewart 22372* (RAW, Fraser-Jenkins in litt, Cat. Pak.); Kamri, 3050 m, 1939-08-17, *R. R. & I. D. Stewart 18634* (RAW, Fraser-Jenkins in litt., Cat. Pak.).

2950-3200 m / mont.: forest, moist, rock (*Picea*, *Pinus wallichiana*) / Altai, Tian Shan, Pamir, Himalaya, China / PAMIR / he.

Pteridaceae (incl. *Cryptogrammeae*)

Cryptogramma stelleri (S. G. Gmel.) Prantl

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12625* (!). – Pa: Pattaro Valley, 3500 m, *Troll 7700*. — ASTOR: As: Rama, 3050 m, 1946-07-27, *R. R. Stewart 22939* (RAW, Fraser-Jenkins in litt., Cat. Pak.).

2950-3500 m / mont.-subalp.: forest, moist, rock (*Picea*, *Pinus wallichiana*) / Himalaya, E Asia, N America / HIMAL / ge.

Pteris vittata L. subsp. *vittata*CHILAS: Ra: Jalipur, 1200 m, *Troll* 7179.

1200 m / coll.: moist, rock / Africa, S Europe, Asia, America / SUBTROP / he.

Woodsiaceae (incl. *Athyriaceae*)***Athyrium attenuatum*** (C. B. Clarke) Tagawa (*Athyrium filix-femina* var. *dentigerum* (Wall. ex C. B. Clarke) Bedd.)CHILAS: Go: Gor > NW, 2950 m, *Dickoré* 12632 (!). – Pa: Pattaro Valley, 3900 m, *Troll* 7709 (“*A. filix-femina* var.”).2950-3900 m / mont. – alp. / W Himalaya: Kashmir – Nepal, SE & E Tibet / HIMAL / he. *Athyrium filix-femina* is not found in the Sino-Himalayan region, where it is replaced by *A. attenuatum*; *Troll*'s specimen might also have been *A. mackinnoniorum* (“*A. mackinnonii*” auct., Fraser-Jenkins in litt.).***Athyrium wallichianum*** (Wall. ex O. Kuntze) Ching

ASTOR/KASHMIR: Kamri P., R. R. Stewart (Cat. Pak.). — ASTOR/DEOSAI: Burzil P., R. R. Stewart (Cat. Pak.).

Himalaya: Kashmir – SE Tibet / HIMAL / he.

Cystopteris dickieana R. Sim (*Cystopteris fragilis* subsp. *dickieana* (R. Sim) Moore) / Dickie's Bladderfern (e)CHILAS: Go: Gor, 3230 m, *Schickhoff* 1528 (det. Fraser-Jenkins); Gor > NW, 2950 m, *Dickoré* 12638 (!). — Astor: Da: Mushkin RH > SE, 2800 m, *Dickoré* 12802 (!).2800-3230 m / mont.: forest, moist, rock (*Abies*, *Picea*, *Pinus wallichiana*) / Europe, Asia, N America / CIRC POL / ge.***Cystopteris fragilis*** (L.) Bernh. / Brittle Bladderfern (e)CHILAS: Go: Gor, 2400 m, *Dickoré* 12533 (!); 2500 m, *Troll* 7154; Gor, Chamuri, 2900-3500 m, *Troll* 7136; Gor, Terimal, 2700 m, *Troll* 7123. – Pa: Pattaro Valley, 4000 m, *Troll* 7711. – Ra: Raikot Gl., nunatak, BC, 4000 m, *Troll* 7773. — ASTOR: Da: Mushkin Forest, RH – Dashkin, 2690 m, *Nüsser* 279 (B!); Turbaling, 2700 m, *Troll* 7888 (“*C. atrovirens*”). – Ru: Rupal Valley, Bayals – Chungphare, 3150 m, *Nüsser* 796 (B!); Rupal Valley, Nagachakali, nunatak, 3890 m, *Nüsser* 658 (B!); Zaipur >, 3120 m, *Schickhoff* 1070 (det. Fraser-Jenkins). – Ka: Kalapani, 3260 m, *Schickhoff* 1221 (det. Fraser-Jenkins).2400-4000 m / submont.-alp.: forest, steppe-forest (*Abies*, *Picea*, *Quercus*) / Europe, Asia, N America / CIRC POL / ge.Specimens not seen may also refer to *C. dickieana*.***Gymnocarpium fedtschenkoanum*** Pojark. (*G. robertianum* auct., non (Hoffm.) Newm., *G. jessoense* auct., non Koidz.)CHILAS: Go: Gor, 2500 m, *Troll* 7151. — ASTOR: Da: Mushkin Forest, RH – Dashkin, 2660 m, *Nüsser* 271 (B!); Mushkin RH <, 2580 m, *Dickoré* 12717 (!); Mushkin RH > SE, 2700 m, *Dickoré* 12767 (!); Turbaling, 2700 m, *Troll* 7889 (“*Dryopteris linnaeana*”).2500-2700 m / submont.-mont.: forest, moist (*Pinus wallichiana*, *Salix wallichiana*) / Pamir, W Himalaya / PAMIR / ge.

Gymnospermae***Cupressaceae***

Juniperus communis* subsp. *alpina (Neilr.) Čelak. (*J. communis* var. *saxatilis* Pallas) / metharo (sh), betar, bhenthri, nuch, padam (u), Alpine Juniper (e)

CHILAS: Babusar P. N, 3620 m (*Dickoré*). – Ra: Bezar Gali – Fairy Meadows, 3740 m, *Nüsser 546* (B!); Fairy Meadows >, 3750 m, *Nüsser 988* (B!); Kosto Valley, 3950 m, *Nüsser 1448* (B!); Raikot Gl., nunatak, 3950 m, *Nüsser 443* (B!); 3960 m, *Nüsser 416* (B!); Raikot Gl., right lateral moraine, 3520 m, *Nüsser 306* (B!); Raikot Valley, 3560 m, *Schickhoff 1632* (!); Raikot, 3700 m, *Peer* (!). — ASTOR: As: Gurikot Valley, 3500 m, *Troll 7521*; Rama Forest, 1950-06-27, A.H.Khan (PPFI-B, Fl. Pak. 184); Rama Ridge S, 3300-4000 m, *Troll 7309a*; Rama Valley, 3800 m, *Nüsser 184* (B!); Rama Valley, Karayabe, 3720 m, *Nüsser 196* (B!); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1043* (!); 3380 m, *Schickhoff 979* (!); Rampur (Kazmi & Siddiqui 1953). – Ru: Bazhin Lake, 3530 m, *Nüsser 12* (B!); lower Rupal Valley, Churit >, 3600 m, *Nüsser 765* (B!); Rupal Ridge, 3500 m, *Nüsser 134* (B!); Rupal Valley, Nagachakali, nunatak, 3500 m, *Nüsser 630* (B!). – Ka: Faqirkot, 3220 m, *Schickhoff 1358* (!). — ASTOR/DEOSAI: Burzil Chowki, 3400 m, *Troll 7037*.

3080-4000 m / mont.-alp.: forest (*Abies*, *Betula*, *Pinus wallichiana*) / Europe, N Asia, SW Karakorum, W & C. Himalaya, N America (W) / CIRCPOL / ch.

Fruit medicinal.

Juniperus excelsa* subsp. *polycarpus (K. Koch) Takht. (*J. macropoda* Boiss., *J. polycarpus* K. Koch) / chilli (sh), padam, shupa, shur (u), Pencil Cedar (e)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1731* (!); 2850 m (*Dickoré*). – Go: Gor, 1930-2940 m (*Dickoré*); 2690 m, *Schickhoff 1561* (!). — ASTOR: Da: Dashkin, 1800-2100 m, *Miehe 950202* (!).

1800-2940 m / coll.-mont.: steppe-forest / Turkey, Caucasus – Baluch., W Himalaya: Afgh. – Nepal / IRAN / ph.

Juniperus semiglobosa Regel (*J. excelsa* auct., non M. Bieb.) / chilli (sh), padam, shupa, shur (u), Pencil Cedar (e)

CHILAS: Go: Gor, 3230 m, *Schickhoff 1513* (!); Gor, Chamuri, 3200 m, *Troll 7131*; 3400 m, *Troll 7134*; Martal, 2920 m, *Nüsser 1159* (B!). – Pa: Diamir Valley, 2970 m (*Schickhoff 2414*). – Ra: Raikot Valley, 3220 m, *Schickhoff 1654* (!). — ASTOR: Da: Mushkin Forest, 2580 m, *Schickhoff 1134* (!); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 241* (B!); 2700 m, *Nüsser 240* (B!). – As: Astor (Kazmi & Siddiqui 1953); 2310 m (Kazmi & Siddiqui 1953); Astor – Gurikot (Kazmi & Siddiqui 1953); Rama (Kazmi & Siddiqui 1953); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1008* (!). – Ru: Bazhin Lake, 3520 m, *Nüsser 7* (B!); 3530 m, *Nüsser 13* (B!); lower Rupal Valley, Churit – Bulashbar, 2480 m, *Nüsser 800* (B!); Rupal Valley, 3010 m (Kazmi & Siddiqui 1953); 3600 m, *Peer 46* (!); 3700 m, *Peer 14* (!); Rupal Valley, Nagachakali, nunatak, 3500 m, *Nüsser 639* (B!); 3500 m, *Nüsser 638* (B!); Shaigiri, 3680 m, *Nüsser 20* (B!); 3690 m, *Nüsser 22* (B!). – Ka: Kalapani (Kazmi & Siddiqui 1953); Rattu, 2740 m, R. R. Stewart ? (Fl. Pak. 184). — ASTOR/KASHMIR: Kamri (Kazmi & Siddiqui 1953).

2310-3700 m / submont.-subalp.: forest, steppe-forest (*Abies*, *Cedrus*, *Picea*, *Pinus gerar-*

diana, *Pinus wallichiana*) / Tian Shan, Pamir, Hindukush, W Himalaya: Afgh. – NW India / PAMIR / ph.

A main source of timber, on certain slopes close to villages this juniper has been totally removed since Troll's time, whereas in the more inaccessible sites it is still plentiful; medicinal.

Juniperus squamata Buch.-Ham. ex D. Don / metharo (sh)

CHILAS: Go: Gor, 3520 m, *Schickhoff 1469* (!); Gor, Chamuri, 3550 m, *Troll 7133*; Gor, Kahlmay, 3950 m, *Nüsser 1098* (B!). – Ra: Raikot Gl., nunatak, 3880 m, *Nüsser 440* (B!). — ASTOR: As: Rama Ridge S, 3300-4000 m, *Troll 7309*; Rama Valley, Karayabe, 3720 m, *Nüsser 195* (B!). – Ru: Rupal Valley, Nagachakali, nunatak, 3500 m, *Nüsser 631* (B!); 3650 m, *Nüsser 651* (B!). – Ka: [?] Kalapani, 3040 m ("*J. recurva*", Kazmi & Siddiqui 1953).

3040-4000 m / mont.-alp.: scrub / Himalaya (E Afgh. – SE Tibet, Burma), China / HIMAL / ch.

Juniperus turkestanica Komarov / chilli (sh)

CHILAS: Babusar P., 4050 m, *Miehe 585* (!). – Go: Gor, 3520 m, *Schickhoff 1467* (!); Gor, Chamuri, 3550 m, *Troll 7132*; Gor, Kahlmay, 3850 m, *Nüsser 1102* (B!). – Ra: Bezar Gali – Fairy Meadows, 3800 m, *Nüsser 545* (B!); Raikot Gl., nunatak, 3880 m, *Nüsser 427* (B!); Raikot Gl., right lateral moraine, 3520 m, *Nüsser 304* (B!); 3520 m, *Nüsser 305* (B!). — ASTOR: As: Chilim >, 3700 m, *Miehe 950801* (!); Rama >, *R. R. Stewart 22913* (Cat. Pak.); Rama Valley, 3800 m, *Nüsser 185* (B!). – Ru: Shaigiri, 3680 m, *Nüsser 21* (B!). — ASTOR/DEOSAI: Chillam – Sardar Chowki, 3500 m, *Troll 7038*.

3500-4050 m / subalp.-alp.: scrub / Tian Shan, Pamir, Karakorum, NW Himalaya / PAMIR / ph.

Pinaceae

Abies pindrow Royle (*A. webbiana* var. *pindrow* (Royle) Brandis) / ray (sh), West Himalayan Fir (e)

CHILAS: Babusar Valley, 3200 m, *Schickhoff 1691* (!). – Ra: [?] Raikot Valley (Repp 1963). — ASTOR: Da: Harchu Valley, Baro Nirril, 3200 m, *Troll 7283*. – As: Astor, 2310 m (Kazmi & Siddiqui 1953); Rama Valley, 3500 m, *Nüsser 187* (B!); 3530 m, *Nüsser 186* (B!); Rama Valley, Sachen Gl. <, 3220 m, *Schickhoff 960* (!); 3380 m, *Schickhoff 977* (!). – Ru: Zaipur >, 3120 m, *Schickhoff 1045* (!). – Ka: Faqirkot, 2980 m (*Schickhoff 1309*); 3220 m (*Schickhoff 1340*); Kalapani, 3040 m (Kazmi & Siddiqui 1953); 3260 m, *Schickhoff 1200* (!).

2310-3530 m / mont.-subalp.: forest (*Abies*, *Betula*, *Picea*, *Pinus wallichiana*) / W Himalaya: E Afgh. – W Nepal / W HIM / ph.

Fairly common on N slopes in Astor, very rare in Gilgit proper. The record from Raikot is doubtful.

Cedrus deodara (Roxb. ex D. Don) G. Don (*Pinus deodara* Roxb. ex D. Don) / deodar (u), Deodar Cedar (e)

CHILAS: Babusar Valley, 2400-2700 m (*Dickoré*); 2750 m (*Schickhoff 1729*). — ASTOR: [?] (Cat. Pak.). – As: [?] Rama (Kazmi & Siddiqui 1953).

2400-2750 m / submont.-mont.: forest (*Cedrus*) / Kurram, W Himalaya: E Afgh. – W Nepal / W HIM / ph.

Common in Babusar Valley, but apparently not much further to the NW (rarely planted in Gilgit proper). Records from Astor are doubtful or may refer to cultivated plants.

Picea smithiana (Wall.) Boiss. (*Pinus smithiana* Wall.) / kachel (sh)

CHILAS: Babusar Valley, 2700-3200 m (*Dickoré*); 3200 m, *Schickhoff 1690* (!). – Go: Gor, 2900-2940 m (*Dickoré*); 3230 m (*Schickhoff 1511*); Gor > NW, 2900 m, *Dickoré 12620* (!); Gor, Chamuri, 2900-3500 m, *Troll 7135*. – Ra: Raikot Valley, 3220 m (*Schickhoff 1653*); 3230 m (*Schickhoff 1600*). — ASTOR: Da: Mushkin Forest, 2900 m, *Schickhoff 1391* (!); 3000 m (*Schickhoff 1413*); Mushkin Forest, RH, 2700 m, *Nüsser 256* (B!). – Ru: Chichi Valley, 3050 m, *Nüsser 138* (B!).

2700-3500 m / mont.-subalp.: forest (*Picea, Pinus wallichiana*) / W Himalaya: E Afgh. – C. Nepal / W HIM / ph.

Often associated with *Pinus wallichiana* but predominantly in moister habitats (N slopes).

Pinus gerardiana Wall. ex Lamb. / tulesh (sh), Gerard's Pine (e)

CHILAS: Babusar Valley, 2750 m (*Schickhoff 1730*). – Go: Gor, 2450-2950 m (*Dickoré*); 2690 m, *Schickhoff 1559* (!); Gor Gali, 2000-2900 m, *Troll 7118*. — ASTOR: 2430 m, *R. R. & I. D. Stewart 7936* (RAW, Fl. Pak. 182). – Da: Doian, 2650 m (*Dickoré*); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 234* (B!). – As: Astor, 2310 m (Kazmi & Siddiqui 1953); Astor – Gurikot (Kazmi & Siddiqui 1953).

2000-2950 m / submont.-mont.: forest, steppe-forest (*Cedrus, Pinus gerardiana*) / E Afgh., Baluch., NW Himalaya / W HIM / ph.

Fairly common around Gor and Dashkin, very rare N of Nanga Parbat in Gilgit (Hunza). Seeds edible, medicinal.

Pinus wallichiana A. B. Jackson (*P. excelsa* Wall. ex Lamb., non Lam., *P. nepalensis* De Chambr.) / chui (sh), beyer, biar, kail (u), Blue Pine (e)

CHILAS: Babusar Valley, 2850-3350 m (*Dickoré*). – Go: Gor, 2770-2940 m (*Dickoré*); 3000-3500 m, *Troll 7148*; 3230 m (*Schickhoff 1512*); 3520 m (*Schickhoff 1466*). – Pa: Bunar Valley, 2500 m, *Peer* (!); Diamir Valley, 2970 m (*Schickhoff 2412*); 3150 m (*Schickhoff 2437*). – Ra: Fairy Meadows, 3300 m, *Troll 7644*; Raikot Valley, 3220 m (*Schickhoff 1652*); 3230 m (*Schickhoff 1599*). — ASTOR: Da: Doian, 3200 m, *Troll 7237*; Doian – Turbaling, 2600 m (*Dickoré*); Mushkin, 2130 m (Kazmi & Siddiqui 1953); Mushkin Forest, 2900 m (*Schickhoff 1380*); 3000 m (*Schickhoff 1412*); Mushkin Forest, RH, 2700 m, *Nüsser 255* (B!). – As: Gudai (Kazmi & Siddiqui 1953); Rama (Kazmi & Siddiqui 1953); Rampur (Kazmi & Siddiqui 1953). – Ru: Chichi Valley, 3050 m, *Nüsser 137* (B!); Rupal Valley, 3010 m (Kazmi & Siddiqui 1953). – Ka: Faqirkot, 2980 m, *Schickhoff 1305* (!); 3220 m (*Schickhoff 1339*); Rattu, 2740 m (Kazmi & Siddiqui 1953).

2130-3520 m / submont.-subalp.: forest (*Abies, Cedrus, Picea, Pinus wallichiana*) / W Himalaya: Afgh. – Nepal / W HIM / ph.

Blue pine is the most widely distributed forest tree of Nanga Parbat, often forming pure stands as on the drier edges of Mushkin forest. A valuable timber for construction; medicinal.

Taxaceae

Taxus wallichiana Zucc. (*T. baccata* subsp. *wallichiana* (Zucc.) Pilger) / chodun (sh), barmi, birmis, thuna (u), Himalayan Yew (e)

CHILAS: Pa: Pattaro Valley, 3060 m, *Nüsser 1349* (B!); Pattaro Valley, Zangal, 2900-3000 m, *Troll 7702*. — ASTOR: As: [?] Astor (Kazmi & Siddiqui 1953).

2900-3060 m / mont.: forest / Himalaya (Afgh. – Burma), Indonesia, Philippines / HIMAL / ph. Rare, NW limit of distribution (Pattaro Valley). The Astor record must be regarded as doubtful or may possibly refer to a cultivated tree; medicinal, poisonous.

Gnetatae

Ephedraceae

Ephedra gerardiana Wall. ex Stapf / sung, suh (sh), asmani buti, som (u)

CHILAS: Ra: Ganalo Gl. – Raikot Gl., N of confluence, 3900 m, *Nüsser 291* (B!, det. Freitag); — ASTOR: Da: [?] Partab bridge – Bunji (Kazmi & Siddiqui 1953); Harchu (Kazmi & Siddiqui 1953). – As: Astor – Gurikot (Kazmi & Siddiqui 1953); Rama Ridge S, 4000 m, *Troll 7308*. – Ru: Rupal Valley, 2740 m, *R. R. Stewart 22853* (NY, US, Freitag in litt.); 3600 m, *Peer* (!); Shaigiri – Latobo, 3600 m, *Nüsser 1572* (B!, det. Freitag); Tap Plain, 3460 m, *Nüsser 740* (B!, det. Freitag as *E. gerardiana* or *E. saxatilis*); Tap – Latobo, 3500-3600 m, *Troll 7420*. – Ka: Fakirkot, 2800 m, *Hansen 116* (! det. Freitag); Rattu (Kazmi & Siddiqui 1953). — ASTOR/KASHMIR: Kamri top (Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil top (Kazmi & Siddiqui 1953).

2740-4000 m / mont.-alp.: dwarf scrub, steppe / Baluch., Himalaya: Afgh. – Bhutan, SE Tibet, SW China / HIMAL / ch.

Medicinal, a source of the alkaloid Ephedrine.

Ephedra intermedia Schrenk & Mey.

CHILAS: Go: Gor Gali, 2700 m, *Troll 7116*. — ASTOR: Da: Astor – Bunji, 1300-2300 m, *F. Schmid 1807* (G, Freitag in litt.); Doian – Turbaling, 2700 m, *Troll 7250* (“var. *tibetica*”); Mushkin Forest, 1950-07-03, *A. H. Khan* (PPFI-B, Fl. Pak. 186). – As: Astor – Gurikot, *Winterbottom* (“var. *tibetica*”, Cat. Pak.); Gurikot – Bulashbar, 2400 m, *Troll 7373* (“var. *tibetica*”); Gurikot – Das Kirim, *R. R. Stewart 22966* (“var. *tibetica*”, Cat. Pak.). – Ru: Rupal – Gurikot, *R. R. Stewart 18904* (RAW, Fl. Pak. 186). – Ka: Rattu nr., 1950-06-30, *A. H. Khan* (PPFI-B, Fl. Pak. 186).

1300-2700 m / submont.-mont. / Siberia, C. Asia, Karakorum, W Himalaya, S Tibet / C AS / ch.

Ephedra przewalskyi Stapf

ASTOR: Da: Bunji, 1300 m, *Troll 7088*.

1300 m / coll.: desert, river terrace / C. Asia, S Karakorum / C AS / ch.

Rare and apparently disjunct along the Indus, up to Shyok confluence and Hunza / Shimshal.

Dicotyledoneae

Amaranthaceae

Amaranthus retroflexus L. / ganhar (sh), Common Amaranth (e)

ASTOR: As: Astor Bazar, Hotel, 2440 m, *Dickoré 12809* (!). – Ka: Faqirkot, 2800 m, *Hansen 107* (!).

2440-2800 m / submont.-mont.: ruderal / N America (introduced cosmopolitan) / COSMO / th.

Anacardiaceae

Pistacia atlantica subsp. ***cabulica*** (Stocks) Rech. f. (*P. cabulica* Stocks, *P. mutica* subsp. *cabulica* (Stocks) Engl.) / gwan, khanjak (u)

CHILAS: Go: Thelichi – Gor Gali, 1500-2000 m, *Troll 7114*. – Pa: Diamir Valley, 1550 m, *Schickhoff 2614a* (!). — ASTOR: Da: Doian <, 1660 m, *Nüsser 712* (B!); Mushkin, 1900 m, *Troll 7257*; Ramghat, 1200-1800 m, *Troll 7058*.

1200-2000 m / coll.-submont. / Iran, Afgh., SW Karakorum, W Himalaya / IRAN / np.

Pistacia khinjuk Stocks (*P. acuminata* Boiss. & Buhse) / kakaou (sh), ushgai, buzgai (u)

CHILAS: Chilas – Babusar, 1140-1550 m (*Dickoré*); Gunar Farm, 1160 m (*Dickoré*). – Go: Darang >, 1550 m, *Dickoré 12684* (!); Gor, 1400-1800 m (*Dickoré*); 1850 m, *Schickhoff 1464* (!); Gor, Hapareng, 1680 m, *Nüsser 1210* (B!). – Pa: Diamir Valley, 1550 m, *Schickhoff 2614b* (!). – Ra: Tato – Raikot Bridge, left slope, 2100 m, *Nüsser 566* (B!); 2160 m, *Nüsser 564* (B!). – Bu: Muthat – Raikot Bridge, 1950 m, *Nüsser 1064* (B!). — ASTOR: Da: Doian, 1660 m (*Dickoré*); Mushkin, 1900 m, *Troll 7256*.

1140-2160 m / coll.-submont.: rock, semi-desert, steppe, steppe-forest (*Artemisia fragrans*, *Heliotropium dasycarpum*, *Stipagrostis plumosa*) / Baluch., W Himalaya: Afgh. – W Nepal / W HIM / np.

Rather common along the Indus and lower Astor Valley, often the only larger shrub to be found on rocky slopes of the colline belt.

Apocynaceae

Trachomitum venetum subsp. ***scabrum*** (Rusnanov) Rech. f. (*Apocynum venetum* var. *scabrum* Bég. & Belos., *A. scabrum* Rusnanov)

CHILAS: Gilgit – Astor, *R. R. Stewart through DFO Gilgit* (RAW!); Indus Valley, *Troll* (Cat. Pak.). — ASTOR: Da: Mushkin, 1950-07-03, *A.H.Khan* (RAW!, Cat. Pak.); 1800 m, *Troll 7915*.

1800 m / coll.: gravel, riverside, sand / (species:) SE Europe, Asia: Turkey – W Himalaya, China, Australia / IRAN / he.

Araliaceae

Aralia cachemirica Decne. / ashgon (sh)

CHILAS: Go: Gor, 2400-2820 m (*Dickoré*). – Pa: Pattaro Valley, Zangal, 2500 m, *Troll 7684*. — ASTOR: *Giles* (Cat. Pak.). – Da: Doian (Cat. Pak.); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 246* (B!).

2400-2820 m / submont.-mont.: deep gullies, forest, rock (*Pinus gerardiana*, *Pinus wallichiana*, *Quercus*) / Himalaya: Kashmir – Bhutan, SE Tibet / HIMAL / he.

Rare on moist, shady, often inaccessible places in gullies.

Asclepiadaceae

Calotropis procera subsp. ***hamiltonii*** (Wight) Ali

CHILAS: Chilas, *Peer* (!); Chilas, 1040 m (*Dickoré*). – Go: Darang, 1280 m, *Nüsser 1213* (B!); 1300 m, *Troll 7166*; Raikot Bridge, 1170-1200 m (*Dickoré*).

1040-1300 m / coll. / S Asia: ?Iraq, ?Iran, Afgh., Pakistan, India, China / SUBTROP / ch. Medicinal.

***Cynanchum acutum* L.**

ASTOR: Da: Doian, 1600-1780 m (*Dickoré*); Ramghat, 1800 m, *Troll 7907*.

1600-1800 m / coll.: desert / N Africa, S Europe, SW & C. Asia, Karakorum, W Himalaya (Chitral – Ladakh) / MEDIT / ge.

Common in Gilgit proper and along the Indus in Baltistan and Ladakh.

***Periploca aphylla* Decne.**

CHILAS: Chilas, 1000 m, *Miehe 950101* (!); 1040 m, *Peer* (!).

1000-1040 m / coll.: desert, rocks / Egypt, Arabia, Jordan, Iraq, Iran, Afgh., Pakistan, India / IRAN / ch.

***Vincetoxicum canescens* (Willd.) Decne. (*Asclepias canescens* Willd., *Cynanchum hirsutinaria* auct., non Med., *C. glaucum* Wall.)**

ASTOR: Ru: Chugam – Rattu, 2600 m, *Troll 7943*. – Ka: Rattu, Kamri Valley, 1901-07-08, *Inayat 25691* (K!, Fl. Pak. 150); Shankargarh >, 3040 m, *R. R. Stewart 22773* (K!, Fl. Pak. 150).

2600-3040 m / submont.-mont.: steppe, steppe-forest / SE Europe, SW Asia, Himalaya: Afgh. – Bhutan, SE Tibet / EURAS / he.

Balsaminaceae

***Impatiens bicolor* Royle**

CHILAS: Babusar, *S. Abedin & M. Qaiser 9047* (KUH, Fl. Pak. 133).

W Himalaya: Chitral – Nepal / W HIM / th.

An attractive species mainly of the Outer Himalaya, N limit of distribution.

***Impatiens brachycentra* Kar. & Kir. / futongi (sh)**

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12622* (!). – Pa: Pattaro Valley, Zangal, 2500 m, *Troll 7683*. – Ra: Tato – Fairy Meadows, 2670 m, *Nüsser 970* (B!, cf.). — ASTOR: *Inayat 25116* (K, Fl. Pak. 133, Cat. Pak.). – Da: Mushkin Forest, 3000 m, *Schickhoff 1438* (!); Mushkin RH <, 2580 m, *Dickoré 12720* (!). – As: Rama Valley, Sachen Gl., left ablation valley, 3480 m, *Nüsser 202* (B!). – Ru: Tarishing, *E. Nasir & Webster 6502* (“*I. parviflora*”, Cat. Pak.). – Ka: Faqirkot, 2980 m, *Schickhoff 1316* (!); Kalapani, 3400 m, *Hansen 93* (!). 2500-3480 m / submont.-subalp.: dwarf scrub, forest, meadow (*Cedrus*, *Picea*, *Pinus wallichiana*, *Salix wallichiana*) / Tian Shan, Pamir, SW Karakorum, W Himalaya / PAMIR / th.

***Impatiens glandulifera* Royle (*Impatiens roylei* Walp.) / Indian Balsam (e)**

CHILAS: Babusar Valley, Jal – Nagat, 2050 m, *Dickoré 12827* (!). — ASTOR: As: Gudai – Chillam, *R. R. Stewart* (Cat. Pak.); *E. Nasir & Webster 6507* (G, RAW, Fl. Pak. 133). – Ka: Rattu, *R. R. Stewart* (Cat. Pak.); *Inayat 25119* (K, Fl. Pak. 133); Rattu – Kalapani, 2700-3200 m, *Troll 7973*. — ASTOR/DEOSAI: Burzil, 2890 m, *C. B. Clarke 29234a* (BM, Fl. Pak. 133).

2050-3200 m / submont.-mont.: flush, meadow / W Himalaya: Hazara, Kashmir – Nepal (introduced Europe) / W HIM / th.

[*Impatiens sulcata* Wall. in Roxb.]

CHILAS: Babusar – Gilgit, *S. Abedin & M. Qaiser 9125* (KUH, Fl. Pak. 133).

Himalaya: Chitral – SE Tibet / HIMAL / th.

May also refer to *I. glandulifera* or *thomsonii*.

Impatiens thomsonii Hook. f.

CHILAS: Go: Gor, 3230 m, *Schickhoff 1521* (!); Gor > NW, 2950 m, *Dickoré 12623* (!). — ASTOR: Da: Doian, *Duthie* (Cat. Pak.); Mushkin RH <, 2580 m, *Dickoré 12722* (!); Mushkin RH > SE, 2700 m, *Dickoré 12771* (!). — As: Gurikot – Gudai, *R. R. Stewart 19739* (RAW, Fl. Pak. 133); Rama Valley, *Lankester & Pearson 1254* (BM, Fl. Pak. 133). — Ru: Rupal Valley, *R. R. Stewart* (Cat. Pak.); Tarishing, 2740 m, *E. Nasir & Webster* (G, K, RAW, W, Fl. Pak. 133). — Ka: Kalapani, 3260 m, *Schickhoff 1207* (!).

2580-3260 m / submont.-mont.: forest, moist (*Abies*, *Picea*, *Pinus wallichiana*, *Salix wallichiana*) / W Himalaya: Hazara, Kashmir – Sikkim / W HIM / th.

Berberidaceae

Berberis orthobotrys Bienert ex Aitch. (*B. brandisiana* Ahrendt, *B. pseudumbellata* R. N. Parker, *B. stewartiana* Jafri, *B. pachyacantha* auct., non Bienert ex Koehne) / tchirko, chirko, churki (sh)

CHILAS: Go: Gor, 2690 m, *Schickhoff 1591* (!); Gor > NW, 2840 m, *Dickoré 12613* (!); 2900 m, *Dickoré 12618* (!); Gor, Martal, 2920 m, *Nüsser 1156* (B!); 2920 m, *Nüsser 1154* (B!); 2930 m, *Nüsser 1079* (B!). — ASTOR: *E. Nasir & Webster 6143* (RAW, Fl. Pak. 87); *Inayat 25468* (“*B. pachyacantha*”, Cat. Pak.); *R. R. Stewart 18898* (Cat. Pak.). — As: Chongra – Gannu, 2400 m, *Hansen 196* (!); Gudai, 2800 m, *R. R. & I. D. Stewart 18941* (RAW, holotype of *B. stewartiana*, Fl. Pak. 87); Gurikot – Das Kirim, 2800 m, *R. R. Stewart 22976* (RAW, “*B. brandisiana*”, Fl. Pak. 87); Gurikot – Gudai, 2700 m, *R. R. & I. D. Stewart 18898* (RAW, Fl. Pak. 87); Los, 2300 m, *Troll 7315*. — Ru: Tap Gl., terminal moraine, 3600 m, *Nüsser 17* (B!, cf.); Tarishing <, *R. R. Stewart 22837* (RAW, Fl. Pak. 87). — Ka: Faqirkot, 2900 m, *Hansen 111a* (!); Kalapani, Kamri Valley, *Inayat 25468* (K!). — ASTOR/DEOSAI: *Burzil P., R. R. Stewart 19865* (RAW, “*B. pseudumbellata*”, Fl. Pak. 87).

2300-3600 m / submont.-subalp.: steppe-forest (*Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / W Himalaya: Afgh. – Nepal, S Karakorum / W HIM / np.

The names given tentatively in the synonymy, and others, may be included here; the taxonomy of W Himalayan *Berberis* appears to be rather confused.

Podophyllum hexandrum Royle (*P. emodi* Wall. ex Royle) / itchemané (sh), bankakri, banwangan (u)

ASTOR: Da: Harchu Valley, Baro Nirril, 3200 m, *Troll 7289*; Harchu Valley, Karmi Haray, 2740 m, *Nüsser 823* (B!). — As: Gudai (Kazmi & Siddiqui 1953); Gudai – Chillam, 3000 m, *E. Nasir & Webster 6510* (RAW, Fl. Pak. 57). — Ru: Tarishing, 2900-3000 m, *Troll 7396*. —

Ka: Faqirkot, 2800 m, *Hansen 52* (!); Kalapani, 3040 m (Kazmi & Siddiqui 1953); Steanmarg (Kazmi & Siddiqui 1953). — ASTOR/KASHMIR: Kamri Kotal, snowline, 3660 m, *Giles 21* (K!). — ASTOR/DEOSAI: Burzil (Kazmi & Siddiqui 1953).

2740-3660 m / mont.-subalp.: forb, forest, meadow, scrub / Himalaya: E Afgh. – SE Tibet, W China / HIMAL / ge.

Medicinal. Not common, NW limit of area (outpost in Gilgit proper).

Betulaceae

Betula utilis subsp. *jacquemontii* (Spach) Kitam. (*B. jacquemontii* Spach, *B. utilis* subsp. *intermedia*, *B. utilis* var. *parva* Kitam.) / johji (sh), boj pattra (u)

CHILAS: Babusar P. N, 3400 m (*Dickoré*); Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2786* (RAW!). – Pa: Diamir Valley, 3150 m, *Schickhoff 2438* (!). – Ra: Bezar Gali – Fairy Meadows, 3600 m, *Nüsser 549* (B!); Fairy Meadows, 3390 m, *Nüsser 947* (B!); Raikot Gl., nunatak, 3880 m, *Nüsser 428* (B!); Raikot Valley, 3230 m, *Schickhoff 1601* (!); 3560 m, *Schickhoff 1631* (!). — ASTOR: Da: Doian, 3300-3700 m, *Troll 7229*; Mushkin RH > SE, 2770 m, *Dickoré 12794* (!). – As: Rama Forest (Kazmi & Siddiqui 1953); Rama Valley, near Kareyabe, 3750 m, *Nüsser 197* (B!); Rama Valley, Sachen Gl. <, 3220 m, *Schickhoff 961* (!); 3380 m, *Schickhoff 976* (!). – Ru: Churit >, 3680 m, *Nüsser 764* (B!); Latobo S, 3780 m, *Nüsser 92* (B!); Rupal Valley, Nagachakali, nunatak, 3900 m, *Nüsser 662* (B!). – Ka: Faqirkot, 2980 m, *Schickhoff 1338* (!); Kalapani, 3040 m (Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil (Kazmi & Siddiqui 1953); Burzil Chowki, 3350 m, *R. R. Stewart 19777* (RAW!); Burzil Valley, 1847-06-28, *Winterbottom 184* (K!).

2770-3960 m / mont.-alp.: forest, moraine, scrub (*Abies*, *Betula*, *Pinus wallichiana*, *Salix karelinii*) / W Himalaya: Afgh. – Nepal (subsp. *utilis*: Nepal – SW China) / W HIM / ph. Dominant subalpine tree, still rather common. The bark is used for wrapping butter, formerly also used as paper for writing; medicinal.

Boraginaceae

Anchusa arvensis subsp. *orientalis* (L.) Nordh. (*A. ovata* Lehm.)

ASTOR: As: Astor Bazar, 2400 m, *Troll 7936*; Rama Valley, 3040 m, *Lankester & Pearson 1456* (BM!). – Ru: Rupal – Gurikot, 2430-2590 m, *R. R. & I. D. Stewart 18928* (RAW, Fl. Pak. 191); 2430-2740 m, *R. R. Stewart 19696* (RAW, Fl. Pak. 191).

2400-3040 m / submont.-mont. / E Africa, SE Europe, SW Asia, Himalaya, China / EURAS / th.

Arnebia benthamii (Wall. ex G. Don) I. M. Johnston (*Echium benthamii* Wall. ex G. Don, *Macrotomia benthamii* (Wall. ex G. Don) DC.) / zogipatsha (sh), gaozuban (u)

ASTOR: Ka: Kalapani – Top, 4000 m, *Hansen 72* (!). — ASTOR/KASHMIR: Kamri, 2430-3040 m (Kazmi & Siddiqui 1953).

2430-4000 m / alp.: scree, turf / W Himalaya: Dir, Hazara – Nepal / W HIM / he.

Medicinal. An attractive and apparently rare plant.

Arnebia euchroma (Royle) I. M. Johnston (*Lithospermum euchromon* Royle, *Macrotomia perennis* Boiss.)

CHILAS: Ra: Raikot Gl., left lateral moraine, 3820 m, *Nüsser 1311* (B!); Raikot Valley, Nunatak, 3900 m, *Troll 7779*. — ASTOR: As: Los, 2800 m, *Troll 7321*.

2800-3900 m / mont.-alp.: scree, turf / Iran, Afgh., Tian Shan, Pamir, S Karakorum, W Himalaya: Chitral – Nepal / IRAN / he.

Arnebia guttata Bunge (*Lithospermum guttatum* (Bunge) I. M. Johnston)

CHILAS: Ra: Raikot Bridge, 1200 m, *Troll 7185*. – Bu: Muthat – Raikot Bridge, 1950 m, *Nüsser 1063* (B!). — ASTOR: Da: Astor – Bunji, 1300-2300 m, *F. Schmid 1809* (BM!), G, RAW, Fl. Pak. 191); Bunji, *F. Schmid* (Cat. Pak.); Hattu Pir, 1520-1830 m, 1885, *Giles* (K, Fl. Pak. 191).

1200-2300 m / coll.-submont.: desert, desert-steppe / C. Asia, Karakorum, NW Himalaya / C AS / he.

Unusually low-lying stands apparently indicate cold air-streams in the mouths of tributaries.

Asperugo procumbens L. / Madwort (e)

ASTOR: (Cat. Pak.). – Da: Doian, 2400-3000 m, *Troll 7216*. – As: Rattu – Gurikot, 2500-2800 m, *F. Schmid 1782* (BM!). – Ru: Rupal Valley, Nahake, 2950 m, *Nüsser 775* (B!). – Ka: Rattu, 2600 m, *Troll 7376*.

2400-3000 m / submont.-mont.: field, forb, ruderal / N Africa, Europe, Asia / EURAS / th.

Cynoglossum glochidiatum Wall. ex Benth. (*C. denticulatum* DC., *C. wallichii* G. Don, *Paracynoglossum denticulatum* (DC.) M. Popov)

CHILAS: Go: Gor, Ranote, 2120 m, *Nüsser 1188* (B!). – Pa: Jiliper Valley, 2800 m, *Troll 7663*. – Ra: Tato – Fairy Meadows, 2700 m, *Troll 7820*. — ASTOR: Da: Bunji, 1400 m, *Troll 7187* ([?]). – As: Rama, 3200 m, *Jankester & Pearson 1391* (BM!). – Ru: Boleshbar Valley [Bulashbar], 2440 m, 1892-08-21, *Duthie* (K!); Rupal Ridge, 3500 m, *Nüsser 135* (B!). – Ka: Kalapani, 3050 m, *Schickhoff 1269* (!); Kalapani Valley, 3400 m, *Troll 8043*; Rattu, 1901-07-08, *Inayat* (K!).

1400-3500 m / coll.-subalp.: dwarf scrub, forest, ruderal, scrub (*Artemisia santolinifolia*, *Cedrus*) / Pamir, S Karakorum, Himalaya: Afgh. – Bhutan / W HIM / th.

Cynoglossum microglochis Benth.

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1732* (!). — ASTOR: Ru: Tarishing, 2700-3000 m, *Troll 7389*. – Ka: Faqirkot, 2980 m, *Schickhoff 1332* (!). — ASTOR/DEOSAI: Burzil P. (Cat. Pak.).

2700-3000 m / mont.: forest (*Cedrus*, *Pinus wallichiana*) / W Himalaya: Afgh. – Kumaon / W HIM / th.

Eritrichium canum (Benth.) Kitam. (s.str.)

ASTOR/KASHMIR: Kamri Bungalow, 3050 m, *R. R. Stewart 22718* (K!).

3050 m / mont. / W Himalaya: E Afgh. – W Nepal. / W HIM / he.

A fairly well defined species if the varieties given in Fl. Pak. are excluded.

[*Eritrichium fruticosum* Klotzsch (*E. canum* var. *fruticosum* (Klotzsch) Y. Nasir)]

This is a common species of adjacent SW Karakorum, Baltistan and Ladakh, to be expected along the Indus Valley, but so far not recorded from the Nanga Parbat area.

[*Eritrichium* sp.]

ASTOR: Da: Doian Ridge, 3200 m, *Troll* 7573.

3200 m / mont. /

The record may refer to *E. patens* Decne. (*E. canum* var. *patens* (Decne.) Y. Nasir) or *E. fruticosum* Klotzsch.

Eritrichium villosum (Ledeb.) Bunge (*E. nanum* subsp. *villosum* (Ledeb.) Brand)

CHILAS: Babusar P., 4050-4100 m, *Miehe* 459 (!); 4300 m, *Miehe* 488 (!); *Miehe* 519 (!); Babusar P. N, 3700 m, *Dickoré* 12862 (!). – Pa: Pattaro Valley, 3900 m, *Troll* 7696; Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser* 1376 (B!). – Ra: Bezar Gali E, Sagar, 3750 m, *Nüsser* 538 (B!); Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser* 1432 (B!); Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser* 1318 (B!); Raikot Gl., nunatak, BC, 3910 m, *Nüsser* 1296 (B!). — ASTOR: Da: Harchu Valley, 3200-3900 m, *Troll* 7298. – As: Rama Valley, 3650 m, *Jankester & Pearson* (BM!). – Ru: Latobo S, 3950 m, *Nüsser* 72 (B!, cf.); 4120 m, *Nüsser* 67 (B!); 4410 m, *Nüsser* 76 (B!); Mazeno High Camp, ascent, 4500 m, *Nüsser* 1485 (B!); upper Mazeno BC, 4320 m, *Nüsser* 1477 (B!). — ASTOR/KASHMIR: Kamri P., 4110 m, *R. R. & I. D. Stewart* 18078 (RAW, Cat. Pak., Fl. Pak. 191); Kamri P. top, 3960-4270 m, *R. R. Stewart* 22677 (K!). — ASTOR/DEOSAI: Burzil, 3040 m, *Koelz* 9409 (RAW, Fl. Pak. 191); Burzil P., 3960 m, *Duthie* 14038 (BM!, K!).

3040-4500 m / mont.-subniv.: avalanche path, dwarf scrub, scree, turf / Siberia, Altai, Tian Shan, Pamir, S Karakorum, W Himalaya / C AS / he.

Hackelia uncinata (Benth.) C. E. C. Fisch. (*Cynoglossum uncinatum* Benth., *Echinosperrum glochidiatum* DC., *Lappula glochidiata* (Wall.) Brand, *Paracaryum glochidiatum* Benth. & Hook., *Rindera glochidiata* Wall.)

ASTOR: Ka: Kalapani, 3260 m, *Schickhoff* 1225 (!); Kalapani Valley, 3300 m, *Troll* 7986. 3260-3300 m / mont.: forest (*Abies*) / Himalaya / HIMAL / he.

Heliotropium dasycarpum Ledeb. (*H. gymnostomum* Hemsley)

CHILAS: Chilas, *A. Rashid* 14 (!, “var. *gymnostomum*”, Fl. Pak. 191); Chilas – Babusar, 1140 m (*Dickoré*). – Go: Darang >, 1550 m, *Dickoré* 12678 (!, “var. *gymnostomum*”); Gor, 1160 m, *Schickhoff* 1454 (!); 1800 m (*Dickoré*); Thelichi, 1260 m, *Dickoré* 12522 (!, “var. *gymnostomum*”). – Bu: Indus Valley, Shangri La, 1280 m, *Nüsser* 1218 (B!, “var. *gymnostomum*”); Indus Valley, terrace, 1200 m, *Nüsser* 701 (B!, “var. *dasycarpum*”). — ASTOR: Da: Indus Valley, KKH – Old Bunji Bridge, 1380 m, *Nüsser* 703 (B!, “var. *dasycarpum*”); Ramghat, 1200-1800 m, *Troll* 7077 (“*H. eichwaldii* var. *gymnostomum*”); 1240 m (*Dickoré*); Ramghat camping ground 1680 m, *Duthie* 12293 (K!, “var. *gymnostomum*”, Fl. Pak. 191).

1140-1800 m / coll.: desert, river terrace, semi-desert (*Heliotropium dasycarpum*, *Stipa-grostis plumosa*) / C. Asia, Iran, Afgh., Baluch., Gilgit / IRAN / ch.

Common along the upper Indus up to Gilgit proper.

***Heliotropium europaeum* L.** / European Heliotrope (e)

CHILAS: Farm – Babusar, S. Abedin & M. Qaiser 9109 (KUH, “var. *lasiocarpum*”, Fl. Pak. 191).

coll.: ruderal / S Europe, SW & S Asia (“var. *lasiocarpum*”: SW Asia: Syria – India) / IRAN / th.

***Lappula barbata* (M. Bieb.) Gürke** (*Echinosperrum barbatum* Lehm., *E. filiforme* Codet, *Lappula saxatilis* (Pallas) Kusn., *Myosotis barbata* M. Bieb., *M. saxatilis* Pallas)

ASTOR: (“var. *cariensis*”, Cat. Pak.). – As: Gudai Valley 3660 m, 1892-07-21, Duthie (K!); Los, 2400 m, Troll 7317. – Ka: Rattu, 2740 m, 1946-07-19, R. R. Stewart (BM!).

2400-3660 m / submont.-subalp. / SW Asia: Turkey – W Himalaya: Kashmir / IRAN / th.

***Lappula consanguinea* (Fisch. & Mey.) Gürke** (*Echinosperrum consanguineum* Fisch. & Mey., *E. lappula* var. *consanguineum* (Fisch. & Mey.) Regel, *Lappula echinata* var. *consanguinea* (Fisch. & Mey.) Brand)

ASTOR: Ru: Churit nr., R. R. & I. D. Stewart 22844 (RAW, Fl. Pak. 191); lower Rupal Valley, 2590 m, R. R. & I. D. Stewart 18862 (RAW, Fl. Pak. 191).

2590 m / submont. / SE Europe, SW & C. Asia, SW Karakorum, W Himalaya / IRAN / th.

***Lappula heterantha* (Ledeb.) Gürke**

ASTOR: Da: Dashkin >, R. R. Stewart 22024 (GH, Fl. Pak. 191).

E Europe, SW & C. Asia / IRAN / th.

***Lindelofia anchusoides* (Lindl.) Lehm.** (*Adelocaryum anchusoides* (Lindl.) Brand, *Cynoglossum anchusoides* Lindl., *Paracaryum heliocarpum* Kerner)

CHILAS: Ra: Raikot Valley, Pungadori Lake, 3300 m, Nüsser 329 (B!). — ASTOR: Da: Mushkin Forest, RH – Turbaling, 2700 m, Nüsser 245 (B!). – As: Gurikot, Partabgarh, 2700 m, Troll 7335. – Ru: Chugam, 2530 m, Giles 91 (K!); Rupal Valley, 3300 m, Nüsser 117 (B!, cf.); Tarishing, 2910 m, Nüsser 751 (B!); village Lower Rupal, 3100 m, Nüsser 1597 (B!). – Ka: Kalapani, 3050 m, Schickhoff 1277 (!); Rattu, Inayat 25700a (K!). — ASTOR/DEOSAI: Deosai – Chillam, 3350 m, E. Nasir & Webster 6392 (RAW, Fl. Pak. 191).

2530-3350 m / submont.: dwarf scrub (*Artemisia santolinifolia*) / Tian Shan, Pamir, SW Karakorum, W Himalaya / PAMIR / he.

***Lindelofia longiflora* (Benth.) Baill.** (*Cynoglossum longiflorum* Benth., *L. spectabilis* Lehm.)

ASTOR: (Cat. Pak.). – Ka: Kalapani – Kamri P., 3800 m, Troll 8062 (“var. *falconeri*”); Rattu nr., 1950-06-30, A.H.Khan (RAW, “var. *falconeri*”, Fl. Pak. 191). — ASTOR/KASHMIR: Kamri P., 3350-3960 m, Giles 700 (K!); 3350-3660 m, Duthie 12581 (K!). — ASTOR/DEOSAI: Burzil P. (“var. *falconeri*”, Cat. Pak.); Burzil P. ascent, R. R. & I. D. Stewart 19126 (RAW, “var. *longiflora*”, Fl. Pak. 191); Mir Panzil P., 3650 m, R. R. Stewart 19985 (RAW, Fl. Pak. 191). 3350-3960 m / subalp. / W Himalaya: Hazara – Nepal / W HIM / he.

A typical species of the Himalaya S slopes.

[*Lindelofia stylosa* (Kar. & Kir.) Brand] (*Cynoglossum stylosum* Kar. & Kir., *L. angustifolia* Brand non *Solenanthus angustifolia* Schrank, *L. benthami* Hook. f., *S. stylosus* (Kar. & Kir.) Lipsky)

ASTOR: (Cat. Pak.).

Tian Shan, Pamir, S Karakorum, W Himalaya / PAMIR / he.

Doubtful record, the species is apparently not known from S of the Karakorum.

Mattiastrum himalayense (Klotzsch) Brand (*M. howardii* Kazmi)

ASTOR: 2130-2440 m, 1892-07-25, *Duthie s.n.* (BM!, holotype of *M. howardii*, K!, E isotype of *M. howardii*). – Da: Ramghat, 1800 m, *Troll 7911*; 1800 m, *Troll 7198*. – As: Gurikot – Gudai, R. R. Stewart 18930 (“*M. howardii*”, Cat. Pak.); Gurikot – Kirim, R. R. & I. D. Stewart 22979 (RAW, “*M. howardii*”).

1800-2440 m / coll.-submont.: dwarf scrub, steppe / W Himalaya: Chitral – Kashmir / W HIM / th.

The characters distinguishing *M. howardii* are slight and hardly justify specific recognition.

Myosotis asiatica Schischk. & Serg. (*M. alpestris* subsp. *asiatica* Vestergren ex Hultén)

CHILAS: Babusar P., 4300 m, *Miehe 481* (!); 4320 m, *Miehe 546* (!); Babusar P. N, 3700 m, *Dickoré 12861* (!); Babusar P. NE, 4210 m, *Dickoré 12915* (!); Babusar Valley, 3200 m, *Schickhoff 1720* (!, cf., veg.). – Go: Gor, Kahlmay, 3610 m, *Nüsser 1089* (B!). – Pa: Pattaro Valley, 3900 m, *Troll 7697*. – Ra: Raikot Gl., nunatak, 4050 m, *Nüsser 414* (B!); Raikot Gl., nunatak, BC, 3870 m, *Nüsser 1305* (B!); 4030 m, *Nüsser 519* (B!); Raikot Valley, Batharet, 3410 m, *Nüsser 999* (B!); Raikot Valley, Pungadori, 3300 m, *Nüsser 924* (B!); Raikot Valley, right slope, 3660 m, *Nüsser 993* (B!); 3740 m, *Nüsser 989* (B!). — ASTOR: (Cat. Pak.). – Da: Harchu Valley, 3500 m, *Nüsser 842* (B!). – As: Sango Sar, 3050-3660 m, *Giles 621* (K!). – Ru: Latobo, Tap Gl., 3800 m, *Nüsser 49* (B!); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1549* (B!); upper Rupal Valley, 3600 m, *Troll 7444*. – Ka: Kalapani, 3050 m, *Schickhoff 1255* (!); 3260 m, *Schickhoff 1217* (!). — ASTOR/DEOSAI: Burzil P., R. R. Stewart 19018 (RAW, Fl. Pak. 191); 3960-4270 m, R. R. Stewart 22057 (K!).

3050-4320 m / mont.-alp.: avalanche path, dwarf scrub, forest, rock, scree, turf (*Abies*, *Artemisia santolinifolia*, *Pinus wallichiana*) / N, C. & SW Asia, SW Karakorum, W Himalaya / C AS / he.

Myosotis laxa Lehm. (*M. cespitosa* C. F. Schultz) / Tufted Forget-me-not (e)

CHILAS: Babusar Valley, Jal – Nagat, 2050 m, *Dickoré 12824* (!).

2050 m / submont.: flush, meadow / Europe, Asia, N America (introduced S America, Australia) / CIRCPOL / th.

Not common in the W Himalaya (Swat – Kashmir).

Nonea caspica (Willd.) G. Don

CHILAS: Go: Gor – Darang, 1880 m, *Dickoré 12673* (!). — ASTOR: Da: Dashkin <, 2000 m, *Troll 7276* (“*N. picta*”). – As: Gurikot, 1901-07-26, *Inayat 25722* (K!).

1880-2000 m / coll.-submont.: ruderal, semi-desert, steppe / E Europe, SW Asia: Caucasus, Iraq – Pakistan, NW Himalaya / IRAN / th.

Nonea edgeworthii A. DC. differing by hardly more than the flower colour (which changes on drying), seems to be conspecific.

Onosma hispidum Wall. ex G. Don (*O. echioides* auct., non L., *O. kashmiricum* I. M. Johnston) / shahrong (sh), koame, laljari, moharanga (u)

ASTOR: Da: Harchu Valley, Baro Nirril, 3200 m, *Troll 7286* (“*O. setosum* var. *gmelinii*”). – As: Chongra, 3000 m, *Hansen 206* (!, cf.). – Ka: Rattu, 2740 m, *R. R. & I. D. Stewart 1889* (RAW, Fl. Pak. 191); Shankargarh, 1901-07-09, *Inayat 25702* (K!). — ASTOR/KASHMIR: Kamri (Kazmi & Siddiqui 1953); Kamri Kotal, snowline, 3660 m, *Giles 140* (K!).

2740-3660 m / mont.-subalp. / SW Karakorum, W Himalaya: Afgh. – Kashmir / W HIM / he. Medicinal.

Pseudomertensia echioides (Benth.) Riedl (*Eritrichium secundiflorum* (Decne.) A. DC., *Lithospermum echioides* Benth., *L. secundiflorum* Decne., *Mertensia echioides* (Benth.) Benth. & Hook. f.)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2727* (RAW); Babusar Valley, 2750 m, *Schickhoff 1734* (!); 3200 m, *Schickhoff 1716* (!). – Pa: Pattaro Valley, Guttum Sagar >, 4450 m, *Nüsser 1333* (B!). — ASTOR: Da: Astor – Doian, *Conway 334* (K!, Cat. Pak.). – As: Gudai, 1901-07-05, *Inayat* (K!); Rama Valley, 3650 m, *Lankester & Pearson 1304* (BM!); Sango Sar, 3050-3660 m, *Giles 595* (K!). – Ru: Chichi Valley, 3200 m, *Troll 7478*; Latobo, Tap Gl., 4000 m, *Nüsser 58* (B!). – Ka: Faqirkot, 2980 m, *Schickhoff 1301* (!); Kalapani, *Inayat 25708* (K!, Cat. Pak.); Shankargarh, 2930 m, *Giles 66* (K!, Cat. Pak.). 2750-4450 m / mont.-alp.: forest (*Cedrus*, *Pinus wallichiana*) / SW Karakorum, W Himalaya / W HIM / he.

Pseudomertensia efornicata (Rech. f. & Riedl) Riedl (*Mertensia strigosa* Melchior, non Greene, *M. primuloides* var. *tanneri* C. B. Clarke, ? *P. anjumiæ* Kazmi)

CHILAS: Go: Gor, 2690 m, *Schickhoff 1565* (!); 2800-3500 m, *Troll 7141*; 2900 m (*Dickoré*); 3230 m, *Schickhoff 1540* (!); Gor > NW, 2600 m, *Dickoré 12581* (!); 2600 m, *Dickoré 12567* (!); 2840 m, *Dickoré 12606* (!); Gor, Kahlmimay <, 3540 m, *Nüsser 1118* (B!). – Ra: Raikot Valley, Jut, 3330 m, *Nüsser 934* (B!); Raikot Valley, Pungadori, 3300 m, *Nüsser 920* (B!). — ASTOR: “Astor & Dorikun P.”, *Tanner* (K! type of *P. moltkioides* var. *tanneri*); *Tanner 10* (“*P. moltkioides* var. *tanneri*”, Cat. Pak.). – Da: Dashkin (“*P. moltkioides* var. *tanneri*”, Cat. Pak.); Harchu Valley, Baro Nirril >, 3120 m, *Nüsser 889* (B!); 3160 m, *Nüsser 858* (B!); 3220 m, *Nüsser 867* (B!); 3230 m, *Nüsser 874* (B!); Harchu Valley, Karmi Haray, 2740 m, *Nüsser 830* (B!); Harchu Valley, Lathang >, 3480 m, *Nüsser 861* (B!); Mushkin Forest, 2900 m, *Schickhoff 1400* (!); 3000 m, *Schickhoff 1442* (!); Mushkin RH <, 2580 m, *Dickoré 12727* (!); Mushkin RH > SE, 2700 m, *Dickoré 12764* (!). – As: Astor, 2280 m, 1950-06-26, A. H. Khan (RAW, [?] “*P. moltkioides* var. *primuloides*”, Fl. Pak. 191); Rama Valley, 3200 m, *Lankester & Pearson 1230* (BM!); Rattu – Gurikot, 2440 m, *F. Schmid 1774* (BM!, RAW, “*P. moltkioides* var. *tanneri*”). – Ru: Gageh, 3070 m, *Nüsser 769* (B!).

2280-3540 m / submont.-subalp.: forest, steppe-forest (*Picea*, *Pinus gerardiana*, *Pinus wallichiana*, *Quercus*, *Salix wallichiana*) / SW Karakorum, NW Himalaya: ?Kurram, Chitral, Gilgit – Astor / ENDEM / he.

Tentative nomenclature and new synonymy according to specimens seen. Superficially intermediate between *P. echioides* and *P. primuloides*, but apparently more closely related to the former.

Pseudomertensia primuloides (Decne.) Riedl (*Mertensia tibetica* C. B. Clarke, *M. nuristanica* Rech. f., *P. moltkioides* auct., non (Royle ex Benth.) Kazmi)

CHILAS: Pa: Pattaro Valley, Guttum Sagar – Kosto Gali, 4750 m, *Nüsser 1396* (B!); 4790 m, *Nüsser 1402* (B!). – Ra: Kosto Valley, 4500 m, *Troll 7720*; Kosto Valley, Jiliper High Camp > Ridge, 4310 m, *Nüsser 1315* (B!). — ASTOR: As: Rama Valley, 3650 m, *Lankester & Pearson 1342* (BM!, “var. *moltkioides*”); 3650 m, *Lankester & Pearson 1402* (BM!, “var. *moltkioides*”). – Ru: Latobo S, 4320 m, *Nüsser 81* (B!); Rupal Valley, *R. R. & I. D. Stewart 3285* (RAW, “var. *primuloides*”). — ASTOR/KASHMIR: Kamri P. top, *R. R. Stewart 22690* (“var. *primuloides* subvar. *primuloides*”, Cat. Pak.); *R. R. Stewart 18675* (“var. *moltkioides*”, Cat. Pak.). — Astor/Skardu: Alampi P., 4260 m, 1892-07-21, *Duthie 12170* (BM!, K!).

3650-4790 m / subalp.-subniv.: rock, scree, turf / SW Karakorum, NW Himalaya / W HIM / he. A distinctive and apparently relatively uniform high-altitude species, often confused or united with *P. moltkioides* (Royle ex Benth.) Kazmi, which represents a different species distributed from Kashmir eastwards. *P. moltkioides* var. *tanneri* and possibly other taxa usually included here, are at least much closer to *P. echioides*, and are tentatively referred here to *P. eformicata*.

Rochelia cardiosepala Bunge

CHILAS: Ra: Tato – Fairy Meadows, 2480 m, *Nüsser 962* (B!). — ASTOR: Da: Doian, 2500 m, *Troll 7243*. – As: Gudai, *R. R. Stewart* (RAW, Cat. Pak.); *R. R. Stewart* (RAW); Gurikot E, 3000 m, *Troll 7355*.

2480-3000 m / submont.-mont.: steppe / SW Asia: Caucasus – NW Himalaya / IRAN / th.

Rochelia disperma (L. f.) C. Koch (*Lithospermum dispernum* L. f., *R. incana* Kar. & Kir., *R. leiocarpa* Ledeb., *R. peduncularis* Boiss., *R. stellulata* Boiss., *R. stylaris* Boiss.)

CHILAS: Go: Gor Gali, 2800 m, *Troll 7103* (“*R. stellulata*”). – Ra: Raikot Valley, Bayal, 3600 m, *Nüsser 1280a* (B!). — ASTOR: Da: Doian, 2500 m, *Troll 7243a* (“*R. stellulata*”). – As: Gurikot – Astor, 2440 m, 1954-05-25, *F. Schmid* (RAW, “*R. stylaris*”); Gurikot E, 3000 m, *Troll 7354* (“*R. peduncularis*”); 3000 m, *Troll 7353* (“*R. leiocarpa*”). – Ru: Bazhin Lake, 3530 m, *Nüsser 11* (B!).

2440-3600 m / submont.-subalp.: steppe / Medit., S Europe, SW Asia: Turkey – Ladakh / IRAN / th.

Various taxa which narrowly merit recognition are included here.

Solenanthus circinnatus Ledeb. (*S. amplifolius* Boiss., *S. rumicifolius* Boiss., *S. stamineus* var. *cuneatifolius* Bornm.)

ASTOR: As: Gudai, 2600 m, *Troll 7045*; Rattu – Gurikot, 2430 m, 1954-05-25, *F. Schmid* (RAW, Cat. Pak., Fl. Pak. 191).

2430-2600 m / submont. / SW Asia: Caucasus – W Himalaya: Chitral, Astor, Dras, Ladakh, Himachal Pradesh / IRAN / he.

Rare in NW Himalaya.

Callitrichaceae***Callitriche palustris* L. (*C. verna* L.) / Water-starwort (e)**

ASTOR: R. R. Stewart (Cat. Pak.). – Ka: Kalapani, 3010 m, *Schickhoff 1292* (!); Rattu (Cat. Pak.). 3010 m / mont.: fen, flush / Europe, Asia, N America / CIRCPO / he.

Campanulaceae

[*Campanula argyrotricha* Wall. ex DC.]

ASTOR: Da: Dashkin – Luskum, 2300 m, *Troll 7281*; Ramghat, 1200-1800 m, *Troll 7054*. 1200-2300 m / coll.-submont. / Himalaya: Kashmir – Bhutan / HIMAL / he.

These records probably refer to *C. pallida* var. *tibetica*.

***Campanula aristata* Wall.**

ASTOR: As: Rama Valley, 3650 m, *Lankester & Pearson 1373* (BM!). – Ka: Kalapani – Kamri P., 3400-4000 m, *Troll 8064*. — ASTOR/KASHMIR: Kamri P., R. R. Stewart & E. Nasir 22692a (K, Fl. Pak. 155); 3960-4260 m, R. R. Stewart & E. Nasir 22692b (K!); 3960 m, R. R. Stewart 18673 (RAW, Fl. Pak. 155).

3400-4260 m / subalp.-alp. / Himalaya, Tibet / HIMAL / ge.

***Campanula cashmeriana* Royle (*C. cashmeriana* var. *evolvulacea* (DC.) C. B. Clarke, *C. evolvulacea* DC., *C. ruderalis* Aitch. & Hemsley)**

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1764* (!). – Go: Gor > NW, 2950 m, *Dickoré 12629* (!). — ASTOR: Ka: Kalapani Valley, 3400 m, *Troll 8038*; Kamri Valley, 3040-3350 m, 1892-08-25, *Duthie* (K!).

2750-3400 m / mont.-subalp.: forest, rock (*Cedrus*, *Picea*, *Pinus wallichiana*) / SW Karakorum, W Himalaya / W HIM / he.

The Nanga Parbat specimens belong to var. *evolvulacea* with cleistogamous flowers usually much smaller than 2 cm long. Whether this deserves a higher taxonomic rank is unknown.

***Campanula latifolia* L. / Giant Bellflower (e)**

ASTOR: Ka: Kalapani, *Giles 676* (K, Fl. Pak. 155); Kalapani Valley, 3200 m, *Troll 8004*. — ASTOR/KASHMIR: Kamri P. (Cat. Pak.).

3200 m / mont. / Europe, SW Asia, W Himalaya / EURAS / he.

***Campanula pallida* Wall. (*C. colorata* Wall.)**

CHILAS: Babusar < 8 miles, *K. Akhtar & M. Qaiser 478* (KUH, “var. *tibetica*”, Fl. Pak. 155); Babusar Village >, 2850 m, *Dickoré 12833* (!, “var. *pallida*”). – Go: Gor, 2690 m, *Schickhoff 1589* (!, cf.); Gor > NW, 2770 m, *Dickoré 12589* (!, “var. *pallida*”); Gor, Martal <, 2650 m, *Nüsser 1174* (B!, “var. *tibetica*”). – Ra: Tato – Fary, 2540 m, *Nüsser 1010* (B!, “var. *pallida*”). — ASTOR: (“var. *tibetica*”, Cat. Pak.). – Da: Mushkin Forest, 3000 m, *Schickhoff 1439* (!, “var. *tibetica*”); Mushkin Forest, RH – Dashkin, 2660 m, *Nüsser 275* (B!, “var. *pallida*”). – As: Gurikot – Das, R. R. Stewart & E. Nasir 18959 (RAW, “var. *tibetica*”, Fl. Pak. 155). – Ru: Zaipur >, 3120 m, *Schickhoff 1075* (!, “var. *tibetica*”). – Ka: Rattu >, 2890 m, R. R. & I. D. Stewart 18802 (RAW, “var. *tibetica*”, Fl. Pak. 155).

2540-3120 m / submont.-mont.: forest, steppe-forest (*Abies*, *Picea*, *Pinus gerardiana*, *P. wallichiana*) / W Himalaya: Afgh. – Nepal / W HIM / he.

The var. *tibetica* may deserve a higher rank.

Codonopsis clematidea (Schrenk) C. B. Clarke (*C. ovata* var. *cuspidata* Chipp, *Glossocomia clematidea* Fisch., *Wahlenbergia clematidea* Schrenk)

CHILAS: Babusar Village, *M. A. Siddiqi & Y. Nasir 2729* (RAW, Fl. Pak. 155); *M. A. Siddiqi & Y. Nasir 2729* (RAW); Babusar Valley, 3200 m, *Schickhoff 1711* (!). – Go: Gor, Martal, 2970 m, *Nüsser 1134* (B!). – Pa: Diamir Valley, 3150 m, *Schickhoff 2465* (!). – Ra: Raikot Valley, 3220 m, *Schickhoff 1663* (!); Raikot Valley, Pungadori, 3300 m, *Nüsser 357* (B!). — ASTOR: As: Gurikot, 2400 m, *Troll 7363*; Rama, *R. R. Stewart* (Cat. Pak.); 3040 m, 1946-07-07, *R. R. Stewart & E. Nasir* (K!); Rama Valley, 3160 m, *Lankester & Pearson 1222* (BM!). – Ru: Rupal Valley, 3200 m, *Nüsser 121* (B!); Zaipur >, 3140 m, *Schickhoff 1100* (!).

2400-3300 m / submont.-mont.: forest (*Pinus wallichiana*) / Tian Shan, Pamir, W Himalaya: E Afgh. – NW India / PAMIR / ge.

Codonopsis ovata Benth. / ludut (u)

ASTOR: Ka: Kalapani – Kamri P., 3700 m, *Troll 8068*.

3700 m / subalp. / W Himalaya: Swat – Kashmir, NW India / W HIM / ge.

Easily confused with *C. clematidea*, and substituting this in the Outer W Himalaya.

Cannabaceae

● ***Cannabis sativa*** L. (*C. indica* Lam.) / bong (sh), bhang (u), Indian Hemp (e)

CHILAS: Chilas – Babusar, 1200 m (*Dickoré*). – Ra: Jalipur, 1200 m, *Troll 7178*. — ASTOR: Da: Dashkin, 2500 m, *Troll 7881*. – Ru: Rupal Valley, 3290 m, *Nüsser 98* (B!).

1200-3290 m / coll.-mont.: field, ruderal / SE Europe, SW & C. Asia (widely cultivated and naturalised) / C AS / th.

Cultivated for pest-control by field borders; generally for fibres and narcotics (ganja, charas, bhang, hashish), and a common weed.

Capparidaceae

Capparis spinosa L. / kabar, khawarg, panetero (u)

CHILAS: Ra: Indus Valley, Shangri La, 1190 m, *Nüsser 571* (B!). – Bu: Indus Valley, Astor Valley – Raikot Bridge, 1470 m, *Nüsser 911* (B!); Indus Valley, terrace, 1200 m, *Nüsser 700* (B!); Muthat – Raikot Bridge, 1300 m, *Nüsser 1069* (B!). — ASTOR: Da: Ramghat, 1200-1800 m, *Troll 7055*; 1240-1500 m (*Dickoré*).

1190-1800 m / coll.: alluvial terrace, desert / Africa, S Europe, Asia / SUBTROP / ch.

Common along the Indus and tributaries up to Ladakh (“var. *spinosa*”).

Cleome viscosa L. (*C. icosandra* L., *Polanisia viscosa* (L.) DC.)

CHILAS: Farm – Gilgit 45 miles, *S. Abedin & M. Qaiser 9079* (KUH, Fl. Pak. 34); Gunar Farm – Chilas, 1100 m (*Dickoré*). – Go: Darang >, 1450 m, *Dickoré 12689* (!).

1100-1450 m / coll.: ruderal, scrub, semidesert / tropical cosmopolitan / SUBTROP / th.

Caprifoliaceae

Lonicera asperifolia (Decne.) Hook. f. & Thomson (*L. semenovii* var. *nuristanica* Kitam., *Xylosteum asperifolium* Decne.) / daray (sh)

CHILAS: Go: Gor, 3520 m, *Schickhoff 1472* (!). — ASTOR: (Cat. Pak.). — As: Das Kirim – Sardar Kothi, upper Burzil stream, 2740-3040 m, *R. R. Stewart 22011* (RAW, Fl. Pak. 174); Gudai – Chillam, 2740 m, *R. R. & I. D. Stewart 19136* (RAW, Fl. Pak. 174). — Ru: Rupal Valley, Bayals, 3160 m, *Nüsser 595* (B!); Tap – Latobo, 3500-3600 m, *Troll 7412*; Tarishing, 2900 m, *Troll 7394*. — Ka: Steanmarg, 3040 m, 1957-07-27, *M. B. Zaman* (RAW, Fl. Pak. 174).

2740-3600 m / mont.-subalp.: scree, scrub / Tian Shan, Pamir, Hindukush, Himalaya: Afgh. – W China / PAMIR / ch.

Lonicera caerulea L. (*L. stenantha* Pojark.)

ASTOR: Da: Mushkin RH <, 2580 m, *Dickoré 12709* (!); Turbaling, 2700 m, *Troll 7885*. — Ru: Tap – Latobo, 3500-3600 m, *Troll 7411* (“var. *edulis*”).

2580-3600 m / submont.-subalp.: forest, moist (*Pinus wallichiana*, *Salix wallichiana*) / Europe, Asia (S to W Himalaya) / EURAS / np.

Lonicera govaniana Wall. ex DC. (*L. discolor* Lindl., *L. orientalis* Lam., *L. caucasica* subsp. *govaniana* (Wall. ex DC.) Hara)

ASTOR: Da: Mushkin RH <, 2580 m, *Dickoré 12734* (!). — Ka: Kalapani Valley, 3000 m, *Troll 7988*; Rattu, *R. R. Stewart* (Cat. Pak.); Shankargarh, *R. R. Stewart 18759* (“*L. discolor*”, Cat. Pak.).

2580-3000 m / submont.-mont.: forest, moist (*Pinus wallichiana*, *Salix wallichiana*) / W Himalaya: E Afgh. (Kurram) – Bhutan / W HIM / np.

Lonicera heterophylla Decne.

CHILAS: Ra: Raikot Gl., nunatak, BC, 3910 m, *Nüsser 1285* (B!). — ASTOR: As: Rama Valley, Sachen Gl. <, 3380 m, *Schickhoff 994* (!). — Ru: Upper Rupal Valley, 3600 m, *Troll 7447*. — Ka: Kalapani – Shankargarh, *R. R. Stewart 22767* (Cat. Pak.); Kalapani Valley, 3000 m, *Troll 7987*.

3000-3910 m / mont.-alp.: forest (*Abies*, *Betula*) / SW Karakorum, W Himalaya / W HIM / np.

Lonicera hispida var. ***bracteata*** (Royle) Rehder ex Airy Shaw (*L. bracteata* Royle)

CHILAS: Babusar Village, *M. A. Siddiqi 2849* (Cat. Pak.). — ASTOR: As: Chillam, 3040 m, *R. R. & I. D. Stewart 18962* (KUH, RAW, Fl. Pak. 174); Gudai – Chillam, 2740 m, *R. R. & I. D. Stewart 19136* (RAW, ? also under *L. asperifolia*, Fl. Pak. 174).

2740-3040 m / mont. / Himalaya: ?Hazara, Kashmir – SE Tibet, SW China / HIMAL / ch. Rare on NW edge of distribution area.

Lonicera microphylla Willd. ex Roem. & Schult. / pashky (sh)

CHILAS: Go: Gor, 2690 m, *Schickhoff 1580* (!). — Pa: Jiliper Valley, 2800-3000 m, *Troll 7676*. — Ra: Bezar Gali – Fairy Meadows, 3410 m, *Nüsser 552* (B!). — Bu: Muthat, 2900 m, *Troll 7596*. — ASTOR: Da: Mushkin Forest, 2580 m, *Schickhoff 1113* (!); 3000 m, *Schickhoff*

1430 (!); Mushkin Forest, RH – Dashkin, 2690 m, *Nüsser 276* (B!); Mushkin RH – Turbaling, 2620 m, *Dickoré 12748* (!). – Ru: Rupal Valley, Shaigiri – Latobo, 3600 m, *Nüsser 1570* (B!). 2580-3600 m / submont.-subalp.: forest, steppe-forest (*Picea*, *Pinus gerardiana*, *Pinus wallichiana*, *Salix wallichiana*) / C. Asia, Hindukush, Karakorum, W Himalaya / C AS / ch.

Lonicera obovata Royle ex Hook. f. & Thomson / papo, itchei-ajali (sh)

CHILAS: Ra: Raikot Valley, Pungadori – Bezar, 3400 m, *Troll 7648*. — ASTOR: As: Rama, R. R. Stewart 22934 (Cat. Pak.); *Mir Ajab & A. Afzal* (ISL, Fl. Pak. 174); Rama Forest, 3350 m, *Schickhoff 1005* (!); Rama Valley, Sachen Gl. <, 3380 m, *Schickhoff 983* (!). – Ru: Rupal Ridge, 3300 m, *Troll 7473*; Rupal Valley, Nagachakali, nunatak, 3730 m, *Nüsser 652* (B!). – Ka: Faqirkot, 3000 m, *Hansen 121* (!); 3220 m, *Schickhoff 1342* (!); Kalapani, 3260 m, *Schickhoff 1246* (!). — ASTOR/DEOSAI: Burzil Chowki, 3040-3350 m, R. R. Stewart 19794 (RAW, Fl. Pak. 174).

3000-3730 m / mont.-subalp.: avalanche path, forest, moraine (*Abies*, *Betula*, *Pinus wallichiana*) / Himalaya: Afgh. – SE Tibet / HIMAL / ch.

Lonicera purpurascens (Decne.) Walp. (*Xylosteum purpurascens* Decne.)

ASTOR: Da: Mushkin RH > SE, 2800 m, *Dickoré 12800* (!). – As: Rama, R. R. Stewart 22903 (Cat. Pak.); 3040 m, *E. Nasir & Webster 6437* (RAW, Fl. Pak. 174); Rama Valley, Sachen Gl. <, 3220 m, *Schickhoff 969* (!); 3380 m, *Schickhoff 980* (!). – Ru: Chichi Valley, 3200 m, *Troll 7483*. – Ka: Kalapani, 3260 m, *Schickhoff 1243* (!). — ASTOR/KASHMIR: Kamri (Cat. Pak.). — ASTOR/DEOSAI: Burzil P. (Cat. Pak.).

2800-3380 m / mont.: forest (*Abies*, *Betula*, *Pinus wallichiana*) / SW Karakorum, W Himalaya Afgh. – Bhutan / W HIM / np.

Lonicera quinquelocularis Hardw. / shozu, pashki (sh)

ASTOR: (Cat. Pak.). – Da: Harchu Valley, Lathang, 2600 m, *Nüsser 819* (B!); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 244* (B!). – Ru: Rupal Valley, 2590 m, R. R. Stewart 22849 (K!, RAW, Fl. Pak. 174); Tarishing, 2930 m, *Nüsser 1605* (B!, cf.). – Ka: Faqirkot, 2800 m, *Hansen 117* (!); Rattu, 2700 m, *Troll 7982*.

2590-2930 m / submont.-mont.: forest (*Cedrus*) / Himalaya: Afgh. – SE Tibet, SW China / HIMAL / np.

Lonicera semenovii Regel (*L. glauca* Hook. f. & Thomson, non Hill)

CHILAS: Babusar P., 4300 m, *Miehe 556* (!); Babusar P. NE, 4210 m, *Dickoré 12899* (!). – Pa: Pattaro Valley, 3900 m, *Troll 7714*; Pattaro Valley, Guttum Sagar >, 4450 m, *Nüsser 1344* (B!). – Ra: Kosto Valley, 4300 m, *Nüsser 1419* (B!); Raikot Gl., 3700 m, *Troll 7620*; Raikot Gl., nunatak, BC, 3910 m, *Nüsser 1284* (B!). — ASTOR: Ru: Mazeno High Camp, ascent, 4700 m, *Nüsser 1509* (B!); Shaigiri, 3650 m, *Troll 7405*.

3650-4700 m / subalp.-subniv.: dwarf scrub, rock, scree, turf / Pamir, Hindukush, Karakorum, Himalaya (Afgh. – SE Tibet) / PAMIR / ch.

Lonicera vaccinioides Rehder (*L. hispida* Hook. f., non Pallas ex Willd.)

ASTOR/DEOSAI: Burzil Chowki, 3350 m, R. R. & I. D. Stewart 19842 (KUH, RAW, Fl. Pak. 174); 3350 m, R. R. & I. D. Stewart 19119 (KUH, RAW, Fl. Pak. 174).

3350 m / mont. / Himalaya: Hazara – SE Tibet / HIMAL / ch.

Lonicera webbiana Wall. ex DC. (*L. alpigena* C. B. Clarke, non L.; *L. oxyphylla* Edgew.)
 ASTOR: As: Chillam, 3040 m, R. R. & I. D. Stewart 18981 (RAW, Fl. Pak. 174). – Ka: Rattu,
 R. R. Stewart (Cat. Pak.). — ASTOR/DEOSAI: Burzil Chowki, 3200 m, R. R. Stewart 19796
 (RAW, Fl. Pak. 174); Burzil P., R. R. & I. D. Stewart 19048 (RAW, Fl. Pak. 174).
 3040-3200 m / mont.: forest, scrub / Himalaya: Afgh. – SE Tibet, China / HIMAL / np.
 Vicarious to *L. heterophylla* in the Outer Himalaya.

Sambucus wightiana Wall. ex Wight & Arn. (*S. ebulus* auct., non L.) / *ganduli* (sh), *gandala* (u)
 CHILAS: Babusar Valley, 2820 m (*Dickoré*). — ASTOR: Ka: Faqirkot, 2700 m, *Hansen*
 217 (!); 2800 m, *Hansen* 55 (!); Kalapani Valley, 2700 m, *Troll* 7983; Rattu, R. R. Stewart
 (Cat. Pak.).
 2700-2820 m / mont. / W Himalaya: Afgh. – NW India / W HIM / he.
 Medicinal.

Viburnum cotinifolium D. Don / *kumatsh* (sh)
 CHILAS: Pa: Jiliper Valley, 2500-3200 m, *Troll* 7672; Pattaro Valley, 3060 m, *Nüsser* 1350
 (B!). — ASTOR: (Cat. Pak.). – Ka: Faqirkot, 2700-2800 m, *Hansen* 105a (!); Kalapani Val-
 ley, 3000 m, *Troll* 7991.
 2500-3200 m / submont.-mont.: forest, scrub, steppe-forest (*Cedrus*) / W Himalaya: Afgh. –
 Kashmir / W HIM / np.

Caryophyllaceae

Arenaria griffithii Boiss.

ASTOR/KASHMIR: Kamri P. (Cat. Pak.).

Pamir, Afgh., NW Himalaya (Chitral, Dras, Suru) / PAMIR / ch.

To be confirmed, rare or possibly confused; common in Chitral, documented outposts on
 the SE edge of its distribution area in Suru / Dras area.

Arenaria leptoclados (Reichb.) Guss. (*A. serpyllifolia* var. *leptoclados* Reichb.)

CHILAS: Babusar Village >, 2850 m, *Dickoré* 12836 (!). – Go: Gor, 2400 m, *Dickoré* 12529 (!).
 2400-2850 m / submont.-mont.: forest, steppe-forest (*Cedrus*, *Juniperus excelsa*, *Quercus*) /
 NW Africa, Europe, Asia / EURAS / th.

Arenaria neelgherrensis Wight & Arn. (*A. orbiculata* auct., non Royle ex Edgew. & Hook. f.)

CHILAS: Babusar P., 3650 m, *S. Abedin* & *M. Qaiser* 9030 (KUH, Fl. Pak. 175); Babusar Val-
 ley, 3200 m, *Schickhoff* 1708 (!, cf.). – Go: Gor, 2690 m, *Schickhoff* 1587 (!); 3230 m, *Schick-*
hoff 1525 (!); 3520 m, *Schickhoff* 1503 (!). – Ra: Raikot Valley, 3560 m, *Schickhoff* 1651 (!);
 Raikot Valley, Bayal, 3600 m, *Nüsser* 1270 (B!); 3600 m, *Nüsser* 1276b (B!). — ASTOR: (Cat.
 Pak.). – Da: Doian – Muthat, 3000 m, *Troll* 7606; Mushkin Forest, 2900 m, *Schickhoff* 1408 (!);
 3000 m, *Schickhoff* 1440 (!); Mushkin RH > SE, 2750 m, *Dickoré* 12787 (!). – As: Rama,
 1955-08-12, *E. Nasir* & *Webster* (RAW, Fl. Pak. 175); 3050-3350 m, R. R. Stewart 22922 (K!);
 Rama Valley, near Sango Sar, 3500 m, *Nüsser* 155 (B!); Rama Valley, Sachen Gl. <, 3380 m,
Schickhoff 1002 (!). – Ru: Rupal Valley, Nagachakali, nunatak, 3440 m, *Nüsser* 602 (B!). – Ka:

Faqirkot, 2980 m, *Schickhoff 1337* (!). — ASTOR/KASHMIR: Kamri P. 3350-3660 m, *R. R. Stewart 22714* (K!).

2690-3650 m / submont.-subalp.: forest, meadow, scrub, steppe-forest, turf (*Abies*, *Betula*, *Cedrus*, *Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / SW Karakorum, Himalaya: Chitral – Assam; S India (Nilgiris) / HIMAL / he.

Previously in part misidentified (also Fl. Pak. 175?) for *A. orbiculata* Royle ex Edgew. & Hook. f., which appears to be confined to the Outer Himalayas.

Arenaria serpyllifolia L. / Thyme-leaved Sandwort (e)

CHILAS: Ra: Raikot Valley, 3220 m, *Schickhoff 1686* (!). — ASTOR: As: Gurikot, 2400 m, *Troll 7543*.

2400-3220 m / submont.-mont.: forest (*Pinus wallichiana*) / NW Africa, Europe, Asia (introduced America) / EURAS / th.

Cerastium cerastioides (L.) Britton (*C. trigynum* Vill., *Stellaria cerastioides* L.) / Starwort Mouse-ear (e)

CHILAS: Babusar P., *S. Abedin & M. Qaiser 9023* (KUH, Fl. Pak. 175); 4050-4100 m, *Miehe 460* (!); 4300 m, *Miehe 522* (!); Babusar P. N, 3700 m, *Dickoré 12850* (!); Babusar P. NE, 4210 m, *Dickoré 12911* (!); Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 27149* (RAW, Fl. Pak. 175). – Go: Gor, 3520 m, *Schickhoff 1508* (!); Gor, Kahlimay, 3590 m, *Nüsser 1117* (B!). – Pa: Pattaro Valley, Guttum Sagar, 4320 m, *Nüsser 1362* (B!); 4490 m, *Nüsser 1385* (B!). – Ra: Raikot Gl., nunatak, 3900 m, *Nüsser 419* (B!); 4250 m, *Nüsser 388* (B!); Raikot Gl., nunatak, BC, 3970 m, *Nüsser 472* (B!); 3990 m, *Nüsser 1299* (B!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 326* (B!). – Bu: Lichar Ridge, Lichar Peak <, 4000-4600 m, *Troll 7875*. — ASTOR: (Cat. Pak.). – Da: Doian Ridge, 3800 m, *Troll 7568*. – As: Rama Forest, *A. H. Khan 90* (PPFI-B, Fl. Pak. 175); Sango Sar, 3050-3660 m, *Giles 610* (K!). – Ru: Upper Mazeno BC, 4320 m, *Nüsser 1460* (B!); upper Rupal Valley, 3500 m, *Troll 7452*. – Ka: Shankargarh, 2900 m, *Giles 116* (K!). — ASTOR/DEOSAI: Burzil P. (cf., *C. alpinum*, Cat. Pak.); 3960-4270 m, *R. R. Stewart 22049a* (K!).

2900-4600 m / mont.-subniv.: avalanche path, boulder slope, dwarf scrub, moist, rock, scree, scrub, turf (*Juniperus*) / Europe, Asia S to Himalaya, E N America / CIRCPOL / he.

Cerastium dahuricum Fisch. ex Spreng.

ASTOR: Ka: Kalapani, 3260 m, *Schickhoff 1244* (!); Kalapani – Rattu, 3500 m, *Hansen 98* (!); Kalapani Valley, 3300 m, *Troll 8011*. — ASTOR/KASHMIR: Kamri P. (Cat. Pak.); 3350-3960 m, *Giles 687* (K!).

3260-3960 m / mont.-subalp.: forest (*Abies*) / N Europe, Asia: Turkey, Caucasus – Siberia, NW Himalaya / EURAS / he.

Outpost, far disjunct from its main distribution area.

Cerastium glomeratum Thuill. (*C. viscosum* auct., *C. vulgatum* var. *glomeratum* Thuill.) / Sticky Mouse-ear (e)

CHILAS: Babusar Village, 3040 m, *M. A. Siddiqi & Y. Nasir 2766* (RAW, Fl. Pak. 175). 3040 m / mont. / Cosmopolitan / COSMO / th.

To be confirmed, generally this species seems to be rarer and confined to lower altitudes than *C. holosteoides* in the W Himalayas.

Cerastium holosteoides Fries em. Hyl. (*C. caespitosum* Gilib., *C. fontanum* subsp. *triviale* (Link) Jalas, *C. vulgatum* L., *C. vulgatum* var. *triviale* (Link) Edgew. & Hook. f.) / Common Mouse-ear (e)

ASTOR: (Cat. Pak.). – Da: Turbaling, 2700 m, *Troll* 7884.

2700 m / mont. / Europe, Asia, N America / CIRCPO / he.

Cerastium pusillum Ser.

CHILAS: Babusar P., coll. *ignot.* (PPFI-B, Fl. Pak. 175); Babusar P., 4300 m, *Miehe* 487 (!); *Miehe* 523 (!); *Miehe* 567 (!); 4320 m, *Miehe* 552 (!); Babusar P., NE, 4210 m, *Dickoré* 12909 (!).

4210-4320 m / alp.: scree, turf / Siberia, C. Asia, NW Himalaya / C AS / th.

Apparently rare in the Inner W Himalaya (Baltistan, Deosai).

Cerastium thomsonii Hook. f.

CHILAS: Pa: Pattaro Valley, 3500 m, *Troll* 7704.

3500 m / subalp. / E. Afgh., NW Himalaya (Chitral – Lahul) / W HIM / he.

To be confirmed, at least rare in the NW part of its range, also in the SW Karakorum. Its relations to C. & N Asiatic species also remain uncertain.

Dianthus anatolicus Boiss.

CHILAS: Go: Gor, 3520 m, *Schickhoff* 1499 (!); Gor > NW, 2600 m, *Dickoré* 12566 (!). – Ra: Raikot Gl., right lateral moraine, 3420 m, *Nüsser* 311 (B!); Raikot Valley, 3220 m, *Schickhoff* 1680 (!); Raikot Valley, Jut, 3330 m, *Nüsser* 938 (B!, cf.). — ASTOR: Da: Dashkin 2290 m, *Giles* 560 (K!); Doian >, 3050-3350 m, 1892-08-14, *Duthie* (K!); Doian Ridge, 3500 m, *Troll* 7581 (cf.: “*D. seguieri*”); Mushkin RH > SE, 2680 m, *Dickoré* 12755 (!). – As: Dumusar Valley, 2500-3000 m, *Troll* 7540; Los, 2400 m, *Troll* 7318; Rama Valley, Sachen Gl., left ablation valley, 3530 m, *Nüsser* 198 (B!). – Ru: Rupal Valley, 3300 m, *Nüsser* 99 (B!); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser* 1538 (B!); Mazeno Gl., 4300 m, *Peer* (!); upper Mazeno BC, 4320 m, *Nüsser* 1482 (B!). – Ka: Kalapani, 3230 m, *Giles* 672 (K!); Rattu, *R. R. Stewart* 18842 (Cat. Pak.); 2800 m, *Troll* 7964; Shankargarh, *R. R. Stewart* 18752 (Cat. Pak.); 2900 m, *Giles* 26 (K!). — ASTOR/DEOSAI: Deosai – Chillam, 3350 m, *E. Nasir & Webster* 2755 (RAW, Fl. Pak. 175).

2290-4320 m / submont.-alp.: forest, meadow, scrub, steppe-forest (*Pinus gerardiana*, *Pinus wallichiana*, *Quercus*) / SW Asia: Turkey – N Pakistan / IRAN / he.

Dianthus crinitus Sm. (*D. fimbriatus* M. Bieb., *D. orientalis* Adams)

CHILAS: Indus Valley, *Troll* (“*D. orientalis*”, Cat. Pak.). – Go: Gor, 2420 m, *Dickoré* 12653 (!). – Ra: Darang – Jalipur, 1200 m, *Troll* 7172 (“*D. fimbriatus*”). – Bu: Indus Valley, Astor Valley – Raikot Bridge, 1470 m, *Nüsser* 908 (B!); Muthat – Raikot Bridge, 1950 m, *Nüsser* 1062 (B!). — ASTOR: Astor Valley, 2440 m, *Duthie* 12252a (K!). – Da: Astor – Bunji, 1300-2300 m, *F. Schmid* 1876 (G, “*D. orientalis*”, Fl. Pak. 175); 1300-2300 m, *F. Schmid* 1729 (G, “*D. orientalis*”, Fl. Pak. 175).

1200-2440 m / coll.-submont.: alluvial terrace, scrub (*Quercus*) / NW Africa, Medit., SW Asia: Turkey – Pakistan / IRAN / he.

Gypsophila muralis* var. *stepposa (Klokov) Schischk. / Annual *Gypsophila* (e)
ASTOR: Ka: Rattu, 2740 m, *R. R. Stewart 18817* (RAW, “var. *stepposa*”, Fl. Pak. 175).
2740 m / mont. / Europe, W & C. Asia / EURAS / th.

Lepyrodiclis holosteoides (C. A. Mey.) Fenzl ex Fisch. & Mey. (*Arenaria holosteoides* Edgew.)

ASTOR: (Cat. Pak.). – Da: Mushkin, 1900 m, *Troll 7255*. – Ru: Rupal Valley, 3300 m, *Nüsser 116* (B!). – Ka: Kalapani, 3260 m, *Schickhoff 1237a* (!).
1900-3300 m / coll.-mont.: cultivated field, forest, ruderal (*Abies*) / Turkey, Caucasus – Afgh., NW Himalaya (Chitral – Nepal), China, Mongolia (introduced in Europe) / C AS / th.

Minuartia biflora (L.) Schinz & Thell. (*Arenaria biflora* L.)

CHILAS: Babusar P., 4300 m, *Miehe 529* (!); Babusar P. N, 3700 m, *Dickoré 12865* (!); Babusar P. NE, 4210 m, *Dickoré 12928* (!). – Ra: Raikot Valley, Nunatak, 4400 m, *Troll 7769*. — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19077* (Cat. Pak.).
3700-4400 m / subalp.-alp.: avalanche path, dwarf scrub, rock, scree, turf / Arctic Europe, Asia, S to W Himalaya / EURAS / he.

Minuartia kashmirica (Edgew.) Mattf. (*Arenaria kashmirica* Edgew. ex Edgew. & Hook. f., *M. lineata* (C. A. Mey.) Bornm.)

CHILAS: Go: Gor > NW, 2600 m, *Dickoré 12572* (!); Gor Gali, 2800 m, *Troll 7105*; Gor, Martal <, 2650 m, *Nüsser 1178* (B!). – Ra: Kosto Valley, 3800 m, *Nüsser 1452* (B!). – Bu: Muthat – Raikot Bridge, 2350 m, *Nüsser 1044* (B!). — ASTOR: Ru: Zaipur >, 3120 m, *Schickhoff 1058* (!). – Ka: Rattu >, 2740-2900 m, *R. R. Stewart 22793* (K!); Shankargarh 2930 m, *Giles 65* (K!).
2350-3800 m / submont.-subalp.: forest, scree / boulders, steppe-forest (*Abies*, *Picea*, *Pinus gerardiana*, *Quercus*) / W Himalaya: Afgh. – Nepal / W HIM / he.

Myosoton aquaticum (L.) Moench (*Cerastium aquaticum* L., *Malachium aquaticum* (L.) Fries, *Stellaria aquatica* (L.) Scop.) / Water Chickweed (e)

CHILAS: Babusar Village, *M. A. Siddiqi 2756* (Cat. Pak.).
Europe, Asia, S to W Himalaya (Swat – Nepal) / EURAS / ge.

Petrorhagia alpina (Habl.) P. W. Ball & Heywood

ASTOR: Ka: Shankargarh > 3050 m, *R. R. Stewart & E. Nasir 22764* (K!, Cat. Pak.). — ASTOR/KASHMIR: Lower Kamri P. (Cat. Pak.).
3050 m / mont.: gravelly banks / SW & C. Asia: Turkey – Afgh., Tian Shan, Pamir, W Himalaya (Swat – Kashmir) / IRAN / th.
Isolated outpost, probably more common in Kishenganga Valley.

Pseudostellaria himalaica (Franch.) Pax (*Krascheninnikowia heterantha* Maxim., *P. bulbosa* sensu Edgew. & Hook. f., non Wulfen, *P. cashmiriana* Schaeftlein, *Stellaria davidii* var. *himalaica* Franch.)

ASTOR/KASHMIR: Kamri (Cat. Pak.).

Himalaya: Chitral – Bhutan, SE Tibet, W China / HIMAL / ge.

N edge of distribution; record may be from Kamri S slope.

Sagina saginoides (L.) Karsten (*Spergula saginoides* L., *Sagina linnaei* C. Presl, *S. procumbens* auct.) / Alpine Pearlwort (e)

ASTOR: (Cat. Pak.). – Da: Doian – Khoijut, 3500 m, *Troll 7236*; Mushkin RH > SE, 2750 m, *Dickoré 12786* (!); 2800 m, *Dickoré 12801* (!). – Ru: Tarishing, 2800 m, *Troll 7391*. – Ka: Kalapani, 3260 m, *Schickhoff 1213* (!); Shankargarh, 3040 m, *R. R. & I. D. Stewart 18760* (RAW, Fl. Pak. 175).

2750-3500 m / mont.-subalp.: forest, moist, scree, turf (*Abies*, *Pinus wallichiana*) / Europe, Asia (S to Himalaya), N America, Mexico / CIRCPOLE / he.

Silene conoidea L. / Cone Catchfly (e)

ASTOR: *A. H. Khan 106* (PPFI-B, Fl. Pak. 175). – As: Gurikot, 2500 m, *Troll 7340*.

2500 m / submont.: cultivated field, ruderal / S Europe, Asia / IRAN / th.

Silene falconeri (Rohrb.) Bocquet (*Melandrium falconeri* Rohrb., non *S. falconeriana* Royle ex Benth., *S. indica* auct., non Roxb. ex Otth)

ASTOR: Da: Doian >, 3350-3650 m, 1892-08-14, *Duthie* (K!). – As: Rama, 3350 m, *E. Nasir & Webster 645* (K!). – Ru: Mazeno High Camp, ascent, 4650 m, *Nüsser 1505* (B!). — ASTOR/DEOSAI: Burzil Chowki, 3350 m, *R. R. Stewart 19758* (RAW, “*S. indica* var. *cashmeriana*”, Fl. Pak. 175); Deosai – Chillam, 3650 m, *E. Nasir & Webster 6400* (RAW, *S. indica* var. *cashmeriana*, Fl. Pak. 175).

3350-4650 m / mont.-subniv.: rock, scree / SW Karakorum, W Himalaya: Astor – Himachal Pradesh / W HIM / he.

A rather well-marked species of the *S. indica* complex, obviously misunderstood in Fl. Pak. 175.

Silene gonosperma subsp. ***himalayensis*** (Rohrb.) Bocquet (*Lychnis himalayensis* (Rohrb.) Edgew. & Hook. f., *Melandrium apetalum* auct., non (L.) Fenzl)

ASTOR: As: Gudai, 1892-07-21, *Duthie* (Bocquet 1969); Rama Valley, 3800 m, *Nüsser 168* (B!); 4570 m, *Lankester & Pearson 1477* (BM, Fl. Pak. 175). – Ru: Rupal Valley, Nagachakali, nunatak, 3890 m, *Nüsser 660* (B!); upper Rupal Valley, 3600 m, *Troll 7445* (cf., *Melandrium apetalum*). — ASTOR/DEOSAI: Burzil P., 4260 m, *R. R. Stewart 22052* (RAW, Fl. Pak. 175).

3600-4570 m / subalp.-subniv.: alluvial fan, moraine / C. Asia, Tibet, Himalaya (Afgh. – W China) / TIBET / he.

In Fl. Pak. 175, part of the material of *R. R. Stewart 22052* is reported as *S. bungei* Bocquet & Baehni; doubtful.

Silene kunawurensis Benth. (*S. afghanica* auct., non Rohrb.)

CHILAS: Go: Gor > NW, 2840 m, *Dickoré 12607* (!). — ASTOR: 1901-07-07, *Inayat 25530* (K!). – Da: Dashkin, 2000-2500 m, *Troll 7274*; Doian, 2430-2740 m, 1885-07-22, *Giles* (K!, “*S. affghanica*”, Cat. Pak.). – As: Chillam – Gudai, 2740 m, *E. Nasir & Webster 6414*

(RAW, Fl. Pak. 175); Gudai Valley, 3040-3350 m, 1892-07-23, *Duthie 12232* (K!); 3350-3650 m, 1892-07-22, *Duthie 12216* (K!). – Ru: Churit – Bulashbar, 2480 m, *Nüsser 804* (B!, cf.); Tarishing – Bayals, 3000 m, *Nüsser 790* (B!, cf.). – Ka: Kalapani, 3230 m, *Giles 670* (K!); Kamri Valley, 2740-3040 m, 1892-08-24, *Duthie*; Rattu, 2740 m, *R. R. Stewart 22790* (K!); 2740 m, *R. R. & I. D. Stewart 18830* (RAW, Fl. Pak. 175); Shankargarh (Cat. Pak.); upper Astor Valley, 2740-3040 m, *R. R. & I. D. Stewart 18742* (NY, RAW, Fl. Pak. 175).

2000-3650 m / submont.-mont.: dry open hillside / NW Himalaya (Swat – Kunawar) / W HIM / he.

Silene moorcroftiana Wall. ex Benth. (*S. persica* subsp. *moorcroftiana* (Wall. ex Rohrb.) Chowd.) / pusho (sh)

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12628* (!). — ASTOR: As: Sango Sar, 3040-3650 m, *Giles 545* (K!). – Ru: Latobo, Tap Gl., left lateral moraine, 3710 m, *Nüsser 44* (B!); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1543* (B!); Mazeno Gl., 4400 m, *Peer* (!); upper Mazeno BC, 4320 m, *Nüsser 1478* (B!). – Ka: Faqirkot, 2800 m, *Hansen 223* (!); Kalapani, 3200 m, *Giles 30* (K!); Rattu, 1901-07-08, *Inayat 25529* (K!); 2700 m, *Troll 7944*; 2740 m, *R. R. Stewart 18843* (RAW, Fl. Pak. 175). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19855* (KUH, Fl. Pak. 175).

2700-4400 m / mont.-alp.: scree, scrub, steppe-forest (*Juniperus excelsa*) / Karakorum, W Himalaya / W HIM / he.

Silene nepalensis Majumdar

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12936* (!). – Ra: Kosto Valley, 4300 m, *Nüsser 1424* (B!, cf.); Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser 1322* (B!, cf.). — ASTOR: Ka: Kalapani, 3260 m, *Schickhoff 1236* (!).

3260-4300 m / mont.-alp.: dwarf scrub, forest (*Abies*) / Himalaya: Swat, Hazara – Bhutan, SW China / HIMAL / he.

A critical species close to *S. gonosperma*, and possibly identical with W Himalayan populations of *S. bungei* sensu Bocquet (1969), also sometimes confused with *S. indica* var. *laxantha*.

Silene tenuis Willd.

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2803* (RAW, Fl. Pak. 175). – Ra: Raikot Gl., nunatak, BC, 4000 m, *Troll 7772*. — ASTOR: Da: Doian, 3040-3650 m, 1892-08-14, *Duthie* (K!). — ASTOR/KASHMIR: Kamri P., *R. R. Stewart 22624* (K!).

3040-4000 m / alp.: rock / ?W Himalaya: Chitral – Kunawar / W HIM / he.

Silene viscosa (L.) Pers. (*Cucubalus viscosus* L., *S. griffithii* Boiss., *S. multifida* Edgew.)

CHILAS: Babusar Village, *M. A. Siddiqi & Y. Nasir 2772* (RAW, Fl. Pak. 175).

mont.: rock / E Europe, Caucasus, Iran, Pakistan, India / IRAN / he.

Silene vulgaris (Moench) Garcke (*S. cucubalus* Wibel, *S. inflata* Sm., *S. latifolia* (Mill.) Britt. & Rendle, non Poir., *S. venosa* (Gilib.) Asch.) / gigio, gigio shah (sh) / Bladder Campion (e)

CHILAS: Babusar Village, *M. A. Siddiqi & Y. Nasir 2789* (RAW, Fl. Pak. 175). – Go: Gor, 3230 m, *Schickhoff 1534* (!). — ASTOR: As: Chongra, 2600 m, *Hansen 131* (!). – Ru: Rupal Valley, 3200 m, *Nüsser 122* (B!); Rupal Valley, Bayals, 3160 m, *Nüsser 584* (B!); village Lower Rupal, 3100 m, *Nüsser 1596* (B!); Zaipur >, 3140 m, *Schickhoff 1105* (!). – Ka: Faqirkot, 2980 m, *Schickhoff 1317* (!); Kalapani, *Giles 18* (K!). — ASTOR/KASHMIR: Kamri, *R. R. Stewart 18710* (Cat. Pak.). — ASTOR/DEOSAI: Burzil ascent, *R. R. Stewart 19041* (Cat. Pak.); Burzil top, *R. R. Stewart 19220* (Cat. Pak.).

2600-3230 m / submont.-mont.: forb, forest, scree, scrub (*Picea*, *Pinus wallichiana*) / NW Africa, Europe, Asia / EURAS / he.

Stellaria alsinoides Boiss. & Buhse

ASTOR: Da: Doian, 2500 m, *Troll 7241*.

2500 m / submont. / Iran, Afgh., Pamir, W Pakistan (Baluch., Chitral, Astor), ? NW India (Spiti) / IRAN / th.

Eastern edge of distribution area; a tiny spring annual which is easily overlooked.

Stellaria decumbens Edgew.

CHILAS: Ra: Kosto Valley, 4400 m, *Troll 7735*. — ASTOR: Ru: Tap, 3500 m, *Troll 7401*.

3500-4400 m / subalp.-alp.: gravel, scree / Altai, Tian Shan, Pamir, Tibet, Himalaya / C AS / ch.

Stellaria graminea L. (s.l.) / Lesser Stitchwort (e)

CHILAS: Go: Gor, Kahlimay <, 3490 m, *Nüsser 1122* (B!); Gor, Martal, 2970 m, *Nüsser 1131* (B!). – Ra: Raikot Valley, Bayal, 3600 m, *Nüsser 1276a* (B!). — ASTOR: As: Gurikot, 2500 m, *Troll 7341*. — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19090* (RAW, *S. montioides* Fl. Pak. 175); 3660 m, *R. R. Stewart 21991* (K!).

2500-3660 m / submont.-subalp.: meadow, scrub / Europe, W & C. Asia, Siberia, Pamir-Alai, S Karakorum, W Himalaya: Afgh. – Kashmir / EURAS / he.

An extremely difficult complex in C. & SW Asia, provisionally retained as an aggregate species here. If separable, *S. brachypetala* Bunge might be the correct name for the taxon, probably including several other subsequently described entities. The identification of the W Himalayan specimens as either *S. persica* Boiss. or *S. montioides* (Edgew. & Hook. f.) Ghazanfar, as employed in Fl. Pak. 175, does not seem to be correct. The latter name refers possibly to a species of the W Tibetan Plateau.

Stellaria irrigua Bunge (*S. subumbellata* Edgew. ex Edgew. & Hook. f., *Holosteum kobresietorum* Rech. f.)

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12893* (!). — ASTOR/KASHMIR: Kamri (Cat. Pak.); — ASTOR/DEOSAI: Burzil P., 3650-4870 m (Cat. Pak.).

3650-4870 m / subalp.-subniv.: flush, moist, turf / Siberia, Mongolia, Altai, Tian Shan, Pamir, Tibet, Himalaya / C AS / th.

[*Stellaria longipes* Goldie]

ASTOR: Da: Doian, 3000 m, *Troll 7562*.

3000 m / mont.

Identity unknown.

Stellaria media (L.) Cyr. (*Alsine media* L.) / Common Chickweed (e)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2810* (RAW, Fl. Pak. 175). — ASTOR: As: Astor Bazar, Hotel, 2440 m, *Nüsser 904* (B!).

2440-3960 m / submont.-alp.: ruderal / Cosmopolitan / COSMO / th.

Stellaria monosperma Buch.-Ham. ex D. Don (*S. crispata* Wall. ex D. Don)

CHILAS: Bu: Muthat, Chwar, 3000 m, *Troll 7834*. — ASTOR: Ka: Kalapani Valley, 3300 m, *Troll 8025*.

3000-3300 m / mont.: forest, rock, scrub / SE Iran, Afgh., SW Karakorum, Himalaya: Swat – Sikkim, W China, Indo-China / HIMAL / he.

[*Stellaria uliginosa* Murray (*S. alsine* Grimm)]

ASTOR: (Cat. Pak.).

Europe, W Asia, ?NW Himalaya / EURAS / he.

Records from the Himalayas are to be confirmed, and may refer to various other species.

Celastraceae***Euonymus fimbriatus*** Wall. (*E. grandiflorus* Wall., *E. lacerus* Wall.) / kallow, kumatsh (sh)

CHILAS: Pa: Jiliper Valley, 2800-3000 m, *Troll 7674*. – Ra: Bezar Gali – Fairy Meadows, 3140 m, *Nüsser 558* (B!). — ASTOR: Da: Harchu Valley, Karmi Haray, 2740 m, *Nüsser 824* (B!). – Ka: Faqirkot, 2700-2800 m, *Hansen 105* (!).

2700-3140 m / mont.: hay meadow / W Himalaya: Afgh. – Nepal, SW China / HIMAL / np.

Chenopodiaceae***Atriplex tatarica*** L. (*A. laciniata* L. p. p.)

CHILAS: Go: Gor, 2420 m, *Dickoré 12663* (!). — ASTOR: Da: Doian, 2130 m, *Giles 548* (K!, Cat. Pak.); Ramghat – Doian, 1580-1660 m (*Dickoré*).

1580-2420 m / coll.-submont. / S & C. Europe, Caucasus, SW & C. Asia, China / C AS / th.

Axyris prostrata L.

ASTOR: As: Gudai Valley, 2740-3050 m, *Duthie 12231* (K!, Cat. Pak.: as *A. hybrida*).

2740-3050 m / mont. / N & C. Asia, Himalaya / C AS / th.

Chenopodium album L. / em (u), Fat-hen (e)

CHILAS: Ra: Raikot Valley, Fary, 2700 m, *Nüsser 1017* (B, det. Freitag !). – Bu: Indus Valley, Shangri La, 1280 m, *Nüsser 1219* (B, det. Freitag !). — ASTOR: Da: Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 222* (B, det. Freitag !). – As: Astor, 2310 m (Kazmi & Siddiqui 1953). – Ru: Rattu – Rupal Valley, 2440 m, *R. R. Stewart 22820* (K!, Cat. Pak.: “*C. glaucum*”).

1280-2700 m / coll.-mont.: ruderal / Cosmopolitan / COSMO / th.

Medicinal. A record of *Ch. glaucum* L. was based on a misidentified specimen.

***Chenopodium atripliciforme* Murray**

CHILAS: Ra: Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 335* (B, det. Freitag !). 3300 m / mont.: forest, ruderal (*Pinus wallichiana*) / W Himalaya: E Afgh. – N India, SW Karakorum / W HIM / th.

***Chenopodium botrys* L. / kona, hamo shah (sh), Jerusalem Oak (e)**

CHILAS: Go: Gor, Hapareng, 1680 m, *Nüsser 1211* (B, det. Freitag !). – Ra: Raikot Valley, Pungadori, 3300 m, *Nüsser 354* (B, det. Freitag !); Tato – Fairy Meadows, 2670 m, *Nüsser 968* (B, det. Freitag !). — ASTOR: Da: Mushkin Forest, RH – Dashkin, 2600 m, *Nüsser 257* (B, det. Freitag !); Ramghat – Doian, 1580 m (*Dickoré*). – As: Astor Bazar, 2400 m, *Troll 7929*; Rampur (Kazmi & Siddiqui 1953); Zail, 2700 m, *Hansen 179* (!). – Ru: Tarishing, 3010 m (Kazmi & Siddiqui 1953).

1580-3300 m / coll.-mont.: forest, ruderal, steppe-forest (*Cedrus*) / N Africa, Europe, W & C. Asia, Karakorum, Himalaya / EURAS / th.

Medicinal.

***Chenopodium foliosum* (Moench) Asch. (*Blitum virgatum* L., *C. blitum* Hook. f., *Mono-carpus foliosum* Moench)**

ASTOR: (Cat. Pak.). – Ru: Churit >, 3500 m, *Nüsser 762* (B, det. Freitag !); Rupal Valley, 3800 m, *Peer* (!). – Ka: Kalapani, 3260 m, *Schickhoff 1247* (!); Rattu, 2700 m, *Troll 7947*.

2700-3800 m / mont.-subalp.: forest, rock fissure (*Abies*, *Cedrus*) / N Africa, Europe, W & C. Asia, Karakorum, Himalaya / EURAS / th.

***Chenopodium murale* L. / Nettle-leaved Goosefoot (e)**

ASTOR: Da: Mushkin Forest, RH – Dashkin, 2600 m, *Nüsser 261* (B!).

2600 m / submont. / N Africa, Europe, Asia; introduced Australia, N America / EURAS / th.

***Chenopodium rubrum* L. / Red Goosefoot (e)**

CHILAS: Pa: Pattaro Valley, 3300 m, *Troll 7708*.

3300 m / mont. / Europe, Asia, N America / CIRCPOL / th.

***Chenopodium vulvaria* L. / Stinking Goosefoot (e)**

CHILAS: Ra: Tato – Fairy Meadows, 2670 m, *Nüsser 969* (B, det. Freitag !).

2670 m / submont. / Europe, W & C. Asia / EURAS / th.

***Corispermum ladakhianum* Grey-Wilson & Wadhwa**

ASTOR: Da: Ramghat entrance, 1240 m, *Dickoré 12707* (!).

1240 m / coll. / Gilgit, Baltistan, Ladakh / ENDEM / th.

Doubful species, closely related to *Corispermum pamiricum* Iljin and possibly several other ill-defined taxa.

***Halogeton glomeratus* (M. Bieb.) C. A. Mey. (*Anabasis glomerata* M. Bieb., *H. tibeticus* Bunge, *H. falconeri* C. B. Clarke ined., *H. kashmirianus* Grey-Wilson & Wadhwa)**

CHILAS: Raikot Bridge – Gunar Farm, 1160-1240 m (*Dickoré*). – Go: Thelichi, 1260 m, *Dickoré 12526* (!). — ASTOR: Da: Lower Astor, 1650 m, *Schickhoff 1195* (!); Ramghat

camping ground, 1680 m, *Duthie 12308* (BM, K!, “*H. falconeri*, *H. kashmirianus*”, Cat. Pak., Grey-Wilson & Wadhwa 1987); Ramghat – Lower Doian, 1240-1580 m (*Dickoré*). 1160-1680 m / coll. / C. Asia, Tian Shan, Pamir, Karakorum, W Himalaya: Afgh. – Kashmir, Ladakh, China / C AS / th.

H. kashmirianus represents hardly more than a more densely woolly (though sometimes very conspicuously so) variant of *H. glomeratus*, and the original material also seems to contain *H. arachnoideus*.

Haloxylon thomsonii Bunge ex Boiss. (*Arthrophytum thomsonii* (Bunge) Ulbr., *Hammada thomsonii* (Bunge ex Boiss.) Iljin)

CHILAS: Chilas, 1000 m, *Miehe 950103* (!). – Go: Darang >, 1550 m, *Dickoré 12677* (!). — ASTOR: Astor Valley, 1520-1830 m, 1892-07-28, *Duthie 12288* (K!, Cat. Pak.). – Da: Ramghat – Doian, 1330-1880 m (*Dickoré*).

1000-1880 m / coll.: semi-desert (*Heliotropium dasycarpum*, *Stipagrostis plumosa*) / Gilgit, Baltistan, Ladakh / ENDEM / ch.

Kochia prostrata (L.) Schrad. (*Salsola prostrata* L.)

CHILAS: Go: Gor, 1930 m (*Dickoré*); 2420 m, *Dickoré 12664* (!). — ASTOR: Da: Dashkin, *Giles 193* (K!); 2300 m (*Dickoré*); Doian, 2290 m, *Giles 552* (K!, Cat. Pak.); 1580-1930 m (*Dickoré*). – As: Gudhai Valley, 3050-3350 m, *Duthie 12240* (K!); Gurikot, 2400 m, *Troll 7544*.

1580-3350 m / coll.-mont.: scrub (*Quercus*) / SE Europe, W & C. Asia, Mongolia, China / C AS / ch.

Krascheninnikovia ceratoides (L.) Guelden. (*Axyris ceratoides* L., *Eurotia ceratoides* (L.) C. A. Mey.) / buldr (sh)

ASTOR: Da: Dashkin, 2300 m (*Dickoré*); 2440 m, *Dickoré 12752* (!); Dashkin – Astor, 2090 m (*Dickoré*); Doian, 2130 m, *Giles 551* (K!, Cat. Pak.); 2500 m, *Troll 7892*; Doian – Turbaling, 2380-2600 m (*Dickoré*); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 225* (B!). – As: Astor – Rama, 2440-2740 m, *R. R. Stewart 22881* (K!); Gurikot, 2400 m, *Troll 7541*; Rama <, *R. R. Stewart 26413* (Cat. Pak.). – Ka: Faqirkot, 2700 m, *Hansen 136a* (!). 2090-2740 m / submont.-mont.: steppe (*Astragalus strobiliferus*, *Krascheninnikovia*) / NW Africa, SW (Spain) & SE Europe, SW & C. Asia, Mongolia, China / C AS / ch.

The rather localized plant of Nanga Parbat matches the type exactly. A different taxon (*K. pungens* (Pazij) Podlech) occurs at higher altitudes in the Karakorum.

Salsola collina Pallas

CHILAS: Go: Darang >, 1450 m, *Dickoré 12698* (!, det. S. Rilke).

1450 m / coll.: desert / Siberia, C. Asia, Afgh., SW Karakorum, NW Himalaya / C AS / th.

Salsola tragus L. subsp. *tragus*

ASTOR: Da: Ramghat, 1500-1900 m, *Troll 7201* (“*Salsola*”); Ramghat entrance, 1240 m, *Dickoré 12706* (!, det. S. Rilke); Ramghat Pul, 1200 m, *Troll 7071* (“*S. kali*”).

1200-1900 m / coll.: desert, road-side, sand / S Europe, SW & C. Asia / EURAS / th.

Troll's records are tentatively included here, though these may refer to *S. collina* Pallas or *S. jacquemontii* Moq., which appear to be sympatric in adjacent areas.

Compositae (Asteraceae)

***Achillea millefolium* L. (*A. cuspidata* Wall.)** / kakatch, katsh (sh), chopandiga, momadnu (u), Yarrow (e)

ASTOR: (Cat. Pak.). – As: Chillam (Kazmi & Siddiqui 1953); Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit* 6375 (“*A. cuspidata*”, Klatt 1880); environs of Naugaum, 1856-09-15/30, *Schlagintweit* 6925 (“*A. cuspidata*”, Klatt 1880); Gue [Gurikot] – Pattere Brok, 1856-09-13, *Schlagintweit* 6214 (“*A. cuspidata*”, Klatt 1880); Kushnat, Gudai nr., 2120 m, 1977-08-04, *Azim & Shaheed* (RAW!). – Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit* 6867 (“*A. cuspidata*”, Klatt 1880); Rupal Valley, 3140 m, *Nüsser* 130 (B!); 3300 m, *Nüsser* 110 (B!); Rupal Valley, Bayals, 3160 m, *Nüsser* 586 (B!); Tap to Masenno [Mazeno] Gl. (Lolio Duru) and Ashursbott, 1856-09-17/19, *Schlagintweit* 7254 (“*A. cuspidata*”, Klatt 1880); Tarishing, 2910 m, *Nüsser* 756 (B!); 2910 m, *Nüsser* 575 (B!); Tarishing – Churit, 2830 m, *Nüsser* 147 (B!); Tashing [Tarishing], 1856-09-15/22, *Schlagintweit* 7427 (“*A. cuspidata*”, Klatt 1880); village Lower Rupal, 3100 m, *Nüsser* 1600 (B!). – Ka: Faqirkot, 2800 m, *Hansen* 48 (!); Kalapani (Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil P. (Kazmi & Siddiqui 1953).

2120-3300 m / submont.-mont.: meadow / Europe, SW & W Asia, W Himalaya / EURAS / he. Medicinal.

***Anaphalis cuneifolia* Hook. f.** / tchuky (sh)

CHILAS: Go: Gor, 3230 m, *Schickhoff* 1519 (!); 3520 m, *Schickhoff* 1492 (!). – Ra: Raikot Gl., left lateral moraine, 3820 m, *Nüsser* 1308 (B!). – Bu: Buldar Valley, 2700 m, *Troll* 7593 (cf., “*A. nubigena*”). — ASTOR: As: Sango Sar, 3040-3650 m, *Giles* 628 (K!). – Ru: Latobo, Tap Gl., 3950 m, *Nüsser* 52 (B!); Rupal Valley, Nagachakali, nunatak, 3620 m, *Nüsser* 644 (B!); 3870 m, *Nüsser* 625 (B!); Zaipur >, 3120 m, *Schickhoff* 1061 (!, cf.).

2700-3950 m / mont.-alp.: moraine, forest, scrub, turf (*Abies*, *Picea*, *Pinus wallichiana*) / SW Karakorum, W Himalaya: Hazara – W Nepal / W HIM / he.

Usually larger than *A. nubigena*, with several heads and at lower altitudes, but circumscription uncertain.

[*Anaphalis mucronata* DC.]

ASTOR: As: Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit* 6376 (Klatt 1880); Sangu Sar [Sango Sar], on the right side of the Tsinger Gl. [Sachen Gl.], 1856-09-12, *Schlagintweit* 6593 (Klatt 1880). – Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit* 6857 (Klatt 1880); N foot of the Dorikon P. (slopes towards Tashing), 1856-10-01, *Schlagintweit* 6836 (Klatt 1880); Pattere or Nahake P., Gue [Gurikot] – Pattere, 1856-09-14, *Schlagintweit* 6756 (Klatt 1880); Tap to Masenno [Mazeno] Gl. (Lolio Duru) and Ashursbott, 1856-09-17/19, *Schlagintweit* 7237 (Klatt 1880); 1856-09-17/19, *Schlagintweit* 7262 (Klatt 1880). — ASTOR/SKARDU: Kinnibari, 1856-09-27, *Schlagintweit* 6814 (Klatt 1880).

The records probably refer to either *A. cuneifolia* or *A. nubigena*.

Anaphalis nubigena Hook. f.

CHILAS: Pa: Pattaro Valley, 4000 m, *Troll 7729*; Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser 1375a* (B!); – Ra: Kosto Valley, 4300 m, *Nüsser 1421* (B!); Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser 1442* (B!); Raikot Gl., nunatak, 4200 m, *Nüsser 382* (B!); Raikot Gl., nunatak, BC, 3990 m, *Nüsser 465* (B!); 4100 m, *Nüsser 480* (B!); 4300 m, *Nüsser 490* (B!); Raikot Valley, Kilo Sagar, 3700-4200 m, *Troll 7791*. — ASTOR: Ru: Latobo, 3600 m, *Troll 7404*; Mazeno Gl., 4300 m, *Peer* (!).
3600-4490 m / subalp.-alp. / SW Karakorum, Himalaya: Afgh. – SE Tibet, SW China / HIMAL / he.

[*Anaphalis royleana* DC.]

ASTOR: As: Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit 6419* (Klatt 1880); Environs of Naugaum, 1856-09-15/30, *Schlagintweit 6919* (Klatt 1880); Gue [Gurikot] – Pattere Brok, 1856-09-13, *Schlagintweit 6221* (Klatt 1880). – Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit 6845* (Klatt 1880); 1856-09-16/24, *Schlagintweit 6844* (Klatt 1880); Tap to Masenno [Mazeno] Gl. (Lolio Duru) and Ashursbott, 1856-09-17/19, *Schlagintweit 7245* (Klatt 1880); Tashing [Tarishing], 1856-09-15/22, *Schlagintweit 7419* (Klatt 1880).

Himalaya: Chitral – SE Tibet / HIMAL.

Usually restricted to the Outer Himalaya, the records possibly refer to *A. virgata*.

Anaphalis virgata Thomson ex C. B. Clarke (? *A. aurora* Rech. f. & Edelb., ? *A. contorta* var. *roseo-alba* (Krasch.) Kitam., ? *A. roseo-alba* Krasch., *A. stoliczkae* C. B. Clarke) / chiki (sh)

CHILAS: Ra: Tato – Fairy Meadows, 2600 m, *Troll 7814*. — ASTOR: Da: Dashkin, 2280 m, *Giles 555* (K!, “*A. contorta*”); Mushkin Forest, RH – Dashkin, 2660 m, *Nüsser 266* (B!); Ramghat, 1370 m (*Dickoré*). – As: Gurikot, 2400 m, *Troll 7555*; Gurikot – Das Kirim, 2430-2740 m, *R. R. Stewart 22927* (K!). – Ru: Chugam, 2430 m, *Giles 631* (K!); 2520 m, *Giles 78* (K!, “*A. contorta*”). – Ka: Faqirkot, 2800 m, *Hansen 49* (!).

1370-2800 m / submont.-mont. / SW Karakorum, W Himalaya: E Afgh. – Lahul (? – Nepal, Bhutan) / W HIM / ch.

Closely related to *A. contorta*, which appears to be restricted to the Outer Himalaya.

Anthemis cotula L. / Stinking Chamomile (e)

ASTOR: As: Astor Bazar, Hotel, 2440 m, *Dickoré 12808* (!).

2440 m / submont.: ruderal / Europe, SW & W Asia (introduced Australia, N America) / EURAS / th.

Arctium lappa L. / Greater Burdock (e)

ASTOR: As: Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit 6415* (Klatt 1880). – Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit 6886* (Klatt 1880).

Europe, Asia / EURAS / th.

Artemisia brevifolia Wall. ex DC. (*A. maritima* auct., non L.) / zunne (sh), rund (u)

CHILAS: Go: Gor, 2420 m, *Dickoré 12665* (!); 2690 m, *Schickhoff 1583* (!); Gor, Martal,

2970 m, *Nüsser 1143* (B!); Gor, Martal <, 2810 m, *Nüsser 1162* (B!). – Ra: Bezar Gali – Fairy Meadows, 3410 m, *Nüsser 554* (B!); Raikot Valley, Fary, 2700 m, *Nüsser 1016* (B!); Raikot Valley, right slope above Fary, 3300 m, *Nüsser 1023* (B!); Tato – Fairy Meadows, 2480 m, *Nüsser 963* (B!); 2930 m, *Nüsser 977* (B!). — ASTOR: (Cat. Pak.). – Da: Doian – Ramghat, *Conway 326* (K!, cf., veg.); Harchu Valley, Baro Nirril >, 3160 m, *Nüsser 855* (B!); Harchu Valley, Lathang >, 3480 m, *Nüsser 860* (B!); Mushkin, 2130 m (Kazmi & Siddiqui 1953); Mushkin Forest, 2580 m, *Schickhoff 1117* (!); Mushkin RH <, 2580 m, *Dickoré 12716* (!). – As: Astor, 2310 m (Kazmi & Siddiqui 1953); Chongra – Bakh, 2900 m, *Hansen 182* (!); Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit 6386* (Klatt 1880); 1856-09-08/20, *Schlagintweit 6416* (Klatt 1880); 1856-09-08/20, *Schlagintweit 6380* (Klatt 1880); environs of Naugaum, 1856-09-15/30, *Schlagintweit 6921* (Klatt 1880); 1856-09-15/30, *Schlagintweit 6913* (Klatt 1880); Gue [Gurikot] – Pattere Brok, 1856-09-13, *Schlagintweit 6212* (Klatt 1880); Gurikot (Kazmi & Siddiqui 1953); Rampur (Kazmi & Siddiqui 1953). – Ru: Churit (Kazmi & Siddiqui 1953); environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit 6852* (Klatt 1880); Latobo, Tap Gl., left lateral moraine, 3750 m, *Nüsser 32* (B!); Rupal Valley, 3010 m (Kazmi & Siddiqui 1953); Rupal Valley, 3600 m, *Peer* (!); Tap Gl. right lateral moraine, 3590 m, *Nüsser 734* (B!); Tap to Masenno [Mazeno] Gl. (Lolio Duru) and Ashursbott, 1856-09-17/19, *Schlagintweit 7271* (Klatt 1880); Tarishing, 3010 m (Kazmi & Siddiqui 1953); Tashing [Tarishing], 1856-09-15/22, *Schlagintweit 7422* (Klatt 1880). – Ka: Faqirkot, 2800 m, *Hansen 109* (!); Rattu, 2740 m (Kazmi & Siddiqui 1953); Rattu – Chamroot (Kazmi & Siddiqui 1953); Shankargarh (Kazmi & Siddiqui 1953).
2130-3750 m / submont.-subalp.: forest, meadow, ruderal, scrub, steppe-forest (*Pinus gerardiana*, *Pinus wallichiana*, *Quercus*, *Salix wallichiana*) / W Himalaya: Afgh. – Himachal Pradesh / W HIM / ch.
Medicinal, formerly collected for its santonin content.

Artemisia capillaris Thunb. (*A. swatensis* Podlech)

CHILAS: Gunar Farm, 1160 m (*Dickoré*). – Go: Thelichi, 1260 m, *Dickoré 12523* (!); watershed Gilgit Valley, 1460-1820 m, *Giles 240* (K!). – Bu: Indus Valley, terrace, 1200 m, *Nüsser 702* (B!, cf.). — ASTOR: Da: Ramghat, 1240-1270 m (*Dickoré*).
Doubtful identification. The specimens differ from *A. scoparia* in being perennial with stout woody stock, inflorescence very glandular.

Artemisia desertorum Spreng. (*A. foetida* Jacq., *A. Jacquemontiana* Besser)

CHILAS: Pa: Pattaro Valley, Zangal, 2600 m, *Troll 7671*. — ASTOR: As: Das Kirim Valley, Chilim, 3250 m, *Miehe 950804* (!); Das Kirim – Sardar Kothi, 2740 m, *R. R. Stewart 22036* (K!, Cat. Pak.); Gudai – Chillam, 2740 m, *E. Nasir & Webster 6516* (RAW!); Gudai, 5 miles >, 2890 m, *E. Nasir & Webster 6516* (K!); Gurikot, 1901-07-06, *Inayat 25656b* (K!); Gurikot – Bulashbar, 2400 m, *Troll 7365*; Gurikot – Kirim, *R. R. Stewart & E. Nasir 22962* (RAW!). – Ru: Rattu – Rupal, *R. R. Stewart & E. Nasir 22811* (RAW!); Rupal Valley, 2740 m, *R. R. & I. D. Stewart 18872* (RAW!). – Ka: Kalapani Valley, 3200 m, *Troll 8005*; Rattu, 2740 m, *R. R. Stewart 18814* (RAW!).
2400-3250 m / submont.-mont.: scrub, semi-desert / W Himalaya: Astor, Ladakh, Zanskar – W Nepal / W HIM / ch.

[*Artemisia dracunculus* L.]

ASTOR: As: Chillam (Kazmi & Siddiqui 1953); Rampur (Kazmi & Siddiqui 1953). – Ka: Kalapani (Kazmi & Siddiqui 1953).

Europe, Asia, N America / CIRCIPOL / ch.

Medicinal. Possibly misidentified for *A. desertorum* (several specimens seen !). *A. dracunculus* occurs with certainty in Gilgit proper.

Artemisia fragrans Willd. (*A. kurramensis* Qazilbash) / zunne (sh)

CHILAS: Babusar Valley, 1350 m, *Schickhoff 1724* (!); 1900 m, *Schickhoff 1728* (!); Raikot Bridge – Gunar Farm, 1240 m (*Dickoré*). – Go: Gor, 1160 m, *Schickhoff 1453* (!); 1400-1930 m (*Dickoré*); Gor, Hapareng, 1680 m, *Nüsser 1212* (B!); 1950 m, *Nüsser 1203* (B!, *A. fragrans* × *brevifolia* ?); Gor, Martal <, 2540 m, *Nüsser 1182* (B!, *A. fragrans* × *brevifolia* ?). – Bu: Indus Valley, Shangri La, 1280 m, *Nüsser 1215* (B!). — ASTOR: R. R. Stewart 23640 (K!). – Ru: Rupal – Gurikot, 2430-2590 m, R. R. Stewart 18910 (RAW!).

1160-2590 m / coll.-submont.: river terrace, semi-desert, steppe (*Artemisia fragrans*) / SW Asia: Caucasus, Iran, Pamir, SW Karakorum, W Himalaya / IRAN / ch.

Taxonomy uncertain. At relatively low altitudes and altitudinally vicarious with *A. brevifolia*, intermediates in lower mont. *Pinus gerardiana* forests. R. R. Stewart 23640 is annotated “Large quantities are gathered for the extraction of santonin in Kashmir proper” (referring to *A. brevifolia* ?).

Artemisia japonica Thunb. (*A. parviflora* Roxb., *A. japonica* var. *parviflora* (Roxb.) Pamp.) / jau (sh), chitta jawan (u)

CHILAS: Go: Gor, 2420 m, *Dickoré 12658* (!); Gor > NW, 2770 m, *Dickoré 12591* (!). – Ra: Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 333* (B!). – Bu: Muthat, 2800 m, *Troll 7842*. — ASTOR: Da: Mushkin RH – Turbaling, 2620 m, *Dickoré 12740* (!); 2620 m, *Dickoré 12741* (!). – As: Astor Bazar, 2400 m, *Troll 7933*. – Ru: Rupal Valley (Cat. Pak.). – Ka: Faqirkot, 2800 m, *Hansen 102* (!); Kalapani, 3050 m, *Schickhoff 1258* (!); Rattu (Cat. Pak.).

2400-3300 m / submont.-mont.: dwarf scrub, forest, moist, ruderal, scrub, steppe-forest (*Artemisia santolinifolia*, *Cedrus*, *Pinus gerardiana*, *Pinus wallichiana*, *Quercus*, *Salix wallichiana*) / Himalaya: Afgh. – SE Tibet, E Asia / HIMAL / he.

Artemisia santolinifolia Turcz. ex Krasch. (*A. gmelinii* auct., non Web. ex Stech., *A. sacrorum* auct., non Ledeb.) / zunne (sh)

CHILAS: Pa: Diamir Valley, 2970 m, *Schickhoff 2420* (!). – Ra: Bezar Gali – Fairy Meadows, 3410 m, *Nüsser 553* (B!). — ASTOR: Da: Dashkin, 2500 m, *Troll 7883*; Mushkin Forest, 2580 m, *Schickhoff 1135* (!); Mushkin RH <, 2580 m, *Dickoré 12724* (!). – As: Chongra, 3000 m, *Hansen 209* (!); environs of Naugaum, 1856-09-15/30, *Schlagintweit 6310* (“*A. messerschmidiana*”, Klatt 1880); Gue [Gurikot] – Pattere Brok, 1856-09-13, *Schlagintweit 6200* (“*A. macrantha*”, Klatt 1880). – Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit 6855* (“*A. macrantha*”, Klatt 1880); Latobo, Tap Gl., left lateral moraine, 3620 m, *Nüsser 31* (B!); Rupal Valley, 2590 m, R. R. & I. D. Stewart 18882 (RAW!); Rupal Valley, Shaigiri – Latobo, 3600 m, *Nüsser 1574* (B!); Tap Gl. right lateral moraine, 3580 m, *Nüsser 729* (B!); Tap Gl., terminal moraine, 3600 m, *Nüsser 14* (B!); Tashing [Tarishing], 1856-09-15/22, *Schlagintweit 7431* (“*A. macrantha*”, Klatt 1880);

1856-09-15/22, *Schlagintweit 7426* (“*A. messerschmidiana*”, Klatt 1880). – Ka: Kalapani, 3050 m, *Schickhoff 1252* (!); 3260 m, *Schickhoff 1232* (!); Rattu in Astor & Rupal Nullah, *R. R. Stewart 18882* (Cat. Pak.).

2500-3620 m / submont.-subalp.: dwarf scrub, forest (*Abies*, *Artemisia santolinifolia*, *Pinus wallichiana*, *Salix wallichiana*) / E Europe, Siberia, C. Asia, W Himalaya / EURAS / ch.

Artemisia scoparia Waldst. & Kit. (*A. capillaris* var. *scoparia* (Waldst. & Kit.) Pamp., *A. trichophylla* Wall. ex DC.) / zunne (sh)

CHILAS: Go: Gor, Ranote, 2120 m, *Nüsser 1199* (B!). – Ra: Raikot Valley, village Fary, 2680 m, *Nüsser 1015* (B!). — ASTOR: Da: Astor – Bunji, 1210-2130 m, 1954-05-28, *F. Schmid* (RAW!); Harchu, 2100 m, *Troll 7917*; Ramghat, 1850 m (*Dickoré*). – As: Astor Bazar, 2400 m, *Troll 7934*; Das via Goltère or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit 6383* (Klatt 1880); environs of Naugaum, 1856-09-15/30, *Schlagintweit 6922* (Klatt 1880). – Ru: Rupal Valley, *R. R. Stewart 22856* (Cat. Pak.); Tashing [Tarishing], 1856-09-15/22, *Schlagintweit 7421* (Klatt 1880).

1210-2680 m / coll.-submont.: house roof, steppe / Europe, Asia / EURAS / ch.

Artemisia siversiana Ehrh. ex Willd. (*A. pallens* Wall.) / kakuz, kakets (sh), atantin (u)

CHILAS: Babusar nr., 1977-08-26, *Azim & Shaheed* (RAW!); Babusar Valley, 2750 m, *Schickhoff 1752* (!). – Go: Gor, Ranote, 2120 m, *Nüsser 1198* (B!). – Ra: Raikot Valley, Fary, 2700 m, *Nüsser 1021* (B!). — ASTOR: *Hansen 174* (!). – Da: Doian, 2110 m (*Dickoré*); 2450 m, *Troll 7882*; Mushkin Forest, RH – Dashkin, 2600 m, *Nüsser 260* (B!); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 223* (B!); Mushkin RH – Turbaling, 2620 m, *Dickoré 12739* (!). – As: Zail, 2700 m, *Hansen 141* (!). – Ru: Churit, 2740 m, *R. R. Stewart 22830* (RAW!).

2110-2750 m / submont.-mont.: forest, ruderal, steppe (*Cedrus*, *Pinus wallichiana*, *Salix wallichiana*) / E Europe, Asia / EURAS / th.

Artemisia tournefortiana Reichenb. (*A. biennis* auct., non Willd.) / Lesser Mugwort (e)

ASTOR: Da: Dashkin, 2300 m (*Dickoré*); Mushkin RH – Turbaling, 2620 m, *Dickoré 12737* (!). – As: Astor Bazar, Hotel, 2440 m, *Nüsser 906* (B!).

2300-2620 m / submont.: forest, moist, ruderal (*Pinus wallichiana*, *Salix wallichiana*) / SW & Middle Asia, Afgh., NW Pakistan / IRAN / th.

[*Artemisia vestita* Wall. ex DC.]

ASTOR: As: Chillam, *R. R. Stewart* (Cat. Pak.). – Ka: Rattu, *R. R. Stewart* (Cat. Pak.).

Records probably refer to *A. santolinifolia*. *A. vestita* seems to be confined to the Outer Himalaya.

Aster falconeri (C. B. Clarke) Hutch. (*A. diplostephioides* var. *falconeri* C. B. Clarke, *Erigeron falconeri* (C. B. Clarke) Botsch.)

ASTOR: As: Burzil P. N, 3960 m, *R. R. Stewart 22094* (K!). — ASTOR/KASHMIR: Kamri P., 3350-3960 m, *Giles 683* (K!); 4000 m, *Troll 8054*.

3350-4000 m / mont.-alp. / W Himalaya: Kashmir – Kumaon, ?Nepal / W HIM / he.
NW-most extension of range, also on Deosai Plains.

Aster flaccidus Bunge subsp. ***flaccidus*** (*A. heterochaeta* C. B. Clarke, *A. tibeticus* Hook. f.)
 CHILAS: Babusar P., 4300 m, *Miehe 516* (!); *Miehe 560* (!); Babusar P. NE, 4210 m, *Dickoré 12933* (!). – Pa: Pattaro Valley, Guttum Sagar – Kosto Gali, 4830 m, *Nüsser 1405* (B!). – Ra: Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser 1429* (B!); Raikot Gl., nunatak, 4250 m, *Nüsser 384* (B!); Raikot Gl., nunatak, BC, 3850 m, *Nüsser 1306* (B!); 4000 m, *Troll 7751*. — ASTOR: Ru: Chungphare Valley, Sharsingi, 4300 m, *Troll 7519*; Tap – Latobo, 3500-3600 m, *Troll 7438*. — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 22093 p.p.* (K!, with *Erigeron multiradiatus*).

3500-4830 m / subalp.-subniv.: boulder slope, dwarf scrub, rock, scree, turf / Siberia, C. Asia, Tibet, Himalaya / C AS / he.

[*Bidens bipinnata* L. (*B. pilosa* var. *bipinnata* (L.) Hook. f.)]

ASTOR: Da: Ramghat Camping Ground, *Duthie* (Cat. Pak.).

Africa, S & E Asia / SUBTROP / th.

Uncertain, no specimen seen, but common in the Outer Himalaya. Herbarium material has been mixed up with the not closely related *B. tripartita*.

Bidens tripartita L. / Trifid Bur-marigold (e)

CHILAS: Go: Darang >, 1450 m, *Dickoré 12686* (!).

1450 m / coll.: wet / N Africa, Europe, Asia, Australia, N America / CIRC POL / th.

Brachyactis pubescens (DC.) Aitch. (*B. robusta* Benth., *Conyza pubescens* DC.)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1749* (!, cf.). – Go: Gor, 3230 m, *Schickhoff 1551* (!). – Ra: Fary, 3200 m, *Troll 7815*; Raikot Gl. – Ganalo Gl. confluence, 3890 m, *Nüsser 297* (B!, cf.); Raikot Gl., nunatak, 3880 m, *Nüsser 438* (B!); Raikot Valley, 3220 m, *Schickhoff 1683* (!); Raikot Valley, Pungadori, 3290 m, *Nüsser 340* (B!, cf.); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 319* (B!, cf.); 3300 m, *Nüsser 317* (B!). — ASTOR: Da: Mushkin Forest, 2430-2740 m, 1892-08-15, *Duthie 12480* (K!); Mushkin RH – Turbaling, 2620 m, *Dickoré 12738* (!); Mushkin RH > SE, 2680 m, *Dickoré 12754* (!).

2430-3890 m / submont.-subalp.: forest, scrub (*Cedrus*, *Picea*, *Pinus wallichiana*, *Salix wallichiana*) / W Himalaya: Afgh. – Nepal / W HIM / th.

Brachyactis roylei (DC.) Wendelbo (*B. umbrosa* (Kar. & Kir.) Benth., *Conyza roylei* DC.)

CHILAS: Go: Gor > NW, 2600 m, *Dickoré 12571* (!). – Ra: Raikot Valley, Pungadori, 3300 m, *Nüsser 353* (B!). — ASTOR: (Cat. Pak.). – Da: Mushkin Forest, 2580 m, *Schickhoff 1119* (!). – Ru: Rupal Valley, Shaigiri – Latobo, 3600 m, *Nüsser 1575* (B!).

2580-3600 m / submont.-subalp.: forest, steppe-forest (*Pinus gerardiana*, *Pinus wallichiana*, *Quercus*) / Karakorum, W Himalaya: Afgh. – Nepal / W HIM / th.

Carduus edelbergii Rech. f. (*C. acanthoides* sensu Aitch., non L., *C. nutans* sensu Hook. f., non L., *C. nutans* var. *lucidus* DC.) / gulebadaward (u)

ASTOR: (Cat. Pak.). – Ka: Kalapani (Kazmi & Siddiqui 1953); Kalapani Valley, 3200 m, *Troll 8001* (“*C. acanthoides*”). — ASTOR/KASHMIR: Kamri (Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil (Kazmi & Siddiqui 1953).

3200 m / mont. / Himalaya: E Afgh. – SE Tibet, SW China / HIMAL / th.
Medicinal.

Carduus kumaonensis (J. Arenes) Kazmi (*C. crispus* subsp. *kumaonensis* J. Arenes)
CHILAS: Babusar 3960 m, A. G. Khan 2 (K!). — ASTOR: Ka: Kalapani 3230 m, *Giles 668* (K!, Cat. Pak.).
3230-3960 m / subalp. / NW Himalaya: Swat – Uttar Pradesh / W HIM / th.

Chondrilla graminea M. Bieb. (*C. setulosa* C. B. Clarke)
ASTOR: *Duthie* (Cat. Pak.). – As: Gurikot, 2430 m, 1899-08-23, *R. R. & I. D. Stewart 18900* (RAW!); 2430 m, *R. R. Stewart 18990* (RAW!). – Ru: Boleshtan Valley [Bulashbar], 2130-2430 m, 1892-08-01, *Duthie* (K!); Chugam, 2430 m, *Giles 633* (K!); Rupal – Gurikot, *R. R. Stewart 22863* (Cat. Pak.); Rupal Valley, 2590 m, *R. R. Stewart 18855* (RAW!, Cat. Pak.).
2130-2590 m / submont. / SW Karakorum, W Himalaya / IRAN / ch.
Ch. setulosa seems to be a minor variant only.

Cichorium intybus L. / kasni (u), Chicory (e)
CHILAS: Go: Gor, 2160 m (*Dickoré*). — ASTOR: As: Astor, 2310 m (Kazmi & Siddiqui 1953). – Ru: Churit E, 2450 m, *Nüsser 1606* (B!); Tarishing, Chungphar Gl. moraine, 2910 m, *Nüsser 664* (B!).
2160-2910 m / submont.-mont. / N Africa, Europe, Asia / EURAS / he.

Cirsium argyranthum DC. (*Cnicus argyranthus* (DC.) C. Clarke, *Cirsium wallichii* DC.)
ASTOR: Da: Dashkin, 2440 m, *Dickoré 12753* (!); Harchu, 2000 m, *Troll 7922*; Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 228* (B!, cf.). – As: Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit 6388* (Klatt 1880); environs of Naugaum, 1856-09-15/30, *Schlagintweit 6923* (Klatt 1880); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1042* (!, veg.). – Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit 6873* (Klatt 1880); Tap to Masenno [Mazeno] Gl. (Lolio Duru) and Ashursbott, 1856-09-17/19, *Schlagintweit 7267* (Klatt 1880).
2000-3080 m / submont.-mont.: flush, forest, moist, ruderal, steppe (*Astragalus strobiliferus*, *Krascheninnikovia*) / Himalaya: Afgh. – SW China / HIMAL / he.

Conyza canadensis (L.) Cronquist (*Erigeron canadensis* L.) / Canadian Fleabane (e)
CHILAS: Gunar Farm, 1160 m (*Dickoré*). – Go: Gor, 2000 m (*Dickoré*); Gor, Ranote, 2120 m, *Nüsser 1196* (B!, cf.). — ASTOR: (Cat. Pak.). – Da: Mushkin Forest, RH – Dashkin, 2600 m, *Nüsser 258* (B!, cf.).
1160-2600 m / coll.-submont.: roadside, ruderal / N America (introduced cosmopolitan) / COSMO / th.

● ***Cosmos bipinnatus*** Cav. / Mexican Aster (e)
ASTOR: Da: Turbaling – Doian, 2570 m (*Dickoré*).
2570 m / th.
Cultivated in garden near village.

Cousinia thomsonii C. B. Clarke

CHILAS: Go: Gor, 3520 m, *Schickhoff 1507* (!). – Ra: Tato – Fairy Meadows, 3200 m, *Troll 7811*. — ASTOR: As: Das Kirim Valley, Chilim, 3250 m, *Miehe 950801* (!); Gudai Valley, 3650-3960 m, 1892-07-21, *Duthie 12161* (K!); Gue [Gurikot] – Pattere Brok, 1856-09-13, *Schlagintweit 6219* (“*C. multiloba*”, Klatt 1880); Gurikot Valley, 3500 m, *Troll 7527*; Rama, R. R. & I. D. Stewart & E. Nasir 21899 (RAW!); Sagar, 3040 m, 1957-07-16, M. B. Zaman (RAW!). – Ru: Chichi Valley, 3050 m, *Nüsser 139* (B!); lower Rupal Valley, R. R. Stewart 18860 (Cat. Pak.); Pattere or Nahake P., Gue [Gurikot] – Pattere, 1856-09-14, *Schlagintweit 6743* (“*C. multiloba*”, Klatt 1880); 1856-09-14, *Schlagintweit 6754* (“*C. multiloba*”, Klatt 1880); Rupal Valley, 2740 m, R. R. Stewart 22827 (K!). 2740-3960 m / mont.-alp.: scrub, semi-desert, steppe / SW Karakorum, W Himalaya: Chitral – Lahul, Garhwal, Kumaon / W HIM / he.

Cremanthodium decaisnei C. B. Clarke

CHILAS: Pa: Pattaro Valley, 4500 m, *Troll 7731*; Pattaro Valley, Guttum Sagar – Kosto Gali, 4750 m, *Nüsser 1397* (B!); 4750 m, *Nüsser 1398* (B!). – Ra: Kosto P., 4800 m, *Peer 45* (!). – Bu: Lichar Ridge, 4600 m, *Troll 7870*. — ASTOR: R. R. Stewart (“f. *clarkei*”, Cat. Pak.). — ASTOR/KASHMIR: Kamri (“f. *clarkei*”, Cat. Pak.). — ASTOR/DEOSAI: Burzil P. (“f. *clarkei*”, Cat. Pak.). 4500-4800 m / subniv.: flush, scree, turf / SW Karakorum, Himalaya: Kashmir – Bhutan, SE Tibet, W China / W HIM / he.

Crepis flexuosa (DC.) Benth. & Hook. f. (*Barkhausia flexuosa* DC., *C. glauca* sensu Hook. f., non Benth., *Youngia glauca* Edgew.)

CHILAS: Ra: Raikot Gl. – Ganalo Gl. confluence, 3890 m, *Nüsser 292* (B!). — ASTOR: (Cat. Pak.). – As: Rama, 2740-3040 m, R. R. Stewart 22917 (K!, RAW!). – Ru: Latobo, Tap Gl., 4000 m, *Nüsser 63* (B!); Mazeno Gl., 4400 m, *Peer* (!); Rupal Valley, 2740 m, R. R. Stewart 18867 (RAW!); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1539* (B!); Tarishing, 2900 m, *Troll 7497*. 2740-4400 m / mont.-alp.: gravel, moraine, scree / C. Asia, Karakorum, Himalaya / C AS / he.

Crepis kashmirica Babc. (*C. blattarioides* Hook. f., non Vill.)

ASTOR/KASHMIR: Kamri P., R. R. Stewart 18679 (Cat. Pak.); R. R. & I. D. Stewart 18735 (RAW!). W Himalaya: Kashmir / ENDEM / he.

Crepis multicaulis Ledeb. / kino (sh)

CHILAS: Babusar P. N, 3550 m, *Dickoré 12842* (!); Babusar Village >, 2850 m, *Dickoré 12834* (!). – Pa: Pattaro Valley, 2900 m, *Troll 7707*; 3200 m, *Troll 7706*. – Ra: Raikot Gl., nunatak, 3900 m, *Nüsser 422* (B!, “subsp. *congesta*”); Raikot Valley, Bayal, 3600 m, *Nüsser 1273* (B!, “subsp. *congesta*”). — ASTOR: Ru: Bazhin Lake, 3530 m, *Nüsser 9* (B!, “subsp. *congesta*”); Mazeno terminal moraine, 4400 m, *Peer 33* (!); Rupal Valley, lower Mazeno BC moraine, 4050 m, *Nüsser 1535* (B!, “subsp. *congesta*”); Rupal Valley, Nagachakali, nunatak, 3440 m, *Nüsser 604* (B!, cf., “subsp. *congesta*”); Zairpur >, 3120 m, *Schickhoff 1062* (!); 3120 m, *Schickhoff 1080* (!).

2850-4400 m / mont.-alp.: dwarf scrub, forest, steppe-forest, turf (*Abies*, *Bistorta affinis*, *Juniperus communis*, *Juniperus excelsa*, *Picea*) / N Europe, N, W & C. Asia, W Himalaya / EURAS / he.

Possibly all specimens are referable to subsp. *congesta* (Regel) Babç. (*C. stoliczkae* Kurz ex C. B. Clarke), which, however, may represent only a form of high altitudes.

***Crepis sancta* (L.) Babç.**

ASTOR: ("subsp. *bifida*", Cat. Pak.). – As: Gurikot, 2500 m, *Troll* 7338. – Ru: Rupal Valley, 3300 m, *Nüsser* 114 (B!).

2500-3300 m / submont.-mont. / E Europe, SW Asia, W Himalaya: Afgh. – Nepal / IRAN / he. Includes subsp. *bifida* (Vis.) Thell. ex Babç.

***Dolomiaea macrocephala* Royle** (*Jurinea dolomiaea* Boiss., *J. macrocephala* (Royle) C. B. Clarke, non DC., *J. himalaica* R. R. Stewart) / guguldup (sh), dhup (u)

ASTOR: As: Sardar Kothi – Burzil P. (Kazmi & Siddiqui 1953). – Ka: Kalapani – Kamri P. (Kazmi & Siddiqui 1953); Kalapani, Rattak, 3800 m, *Hansen* 85 (!). — ASTOR/KASHMIR: Kamri P. (Cat. Pak.). — ASTOR/DEOSAI: Burzil P., 3650 m, *R. R. Stewart* 22084 (K!); Chillam – Sochar P., 3350-3650 m, *E. Nasir & Webster* 6519 (RAW!).

3350-3800 m / mont.-subalp.: rock, scree / Karakorum, Himalaya: Pakistan – Nepal / W HIM / he.

Medicinal.

***Doronicum falconeri* C. B. Clarke**

CHILAS: Ra: Raikot Gl., nunatak, BC, 4000 m, *Troll* 7757. — ASTOR: Ru: Latobo S, 4270 m, *Nüsser* 85 (B!); 4270 m, *Nüsser* 82 (B!). — ASTOR/DEOSAI: Burzil Peak, *Koelz* 9429 (Cat. Pak.). — Astor/Skardu: Alampi P., 4260 m, *Duthie* 12164 (K!).

4000-4270 m / alp.: boulder slope, rock, scree / SW Karakorum, W Himalaya / W HIM / he.

***Doronicum roylei* DC.**

ASTOR/KASHMIR: Kamri (Kazmi & Siddiqui 1953); Kamri P., 3350-3960 m, *Giles* 705 (K!, unusually large heads).

3350-3960 m / mont.-alp. / Himalaya: Kashmir – Bhutan / HIMAL / he.

Medicinal. NW limit of distribution. Common in the outer W Himalaya.

***Echinops cornigerus* DC.** (*E. coriarius* C. B. Clarke, *E. tibeticus* Bunge)

CHILAS: Ra: Raikot Bridge, 1300 m, *Troll* 7183. – Bu: Muthat – Raikot Bridge, 1580 m, *Nüsser* 1066 (B!). — ASTOR: Da: Indus Valley, KKH – Old Bunji Bridge, 1380 m, *Nüsser* 704 (B!). – As: Environs of Naugaum, 1856-09-15/30, *Schlagintweit* 6906 (Klatt 1880); Harchu – Astor, 2150 m (*Dickoré*). – Ru: Boleshtan Valley [Bulashbar], 2130-2430 m, *Duthie* 12489 (K!); environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit* 6871 ("E. *echinatus*", Klatt 1880); lower Rupal Valley, *R. R. Stewart* 18876 (Cat. Pak.).

1300-2430 m / coll.-submont.: desert, semi-desert / Pamir, SW Karakorum, NW Himalaya, Ladakh / PAMIR / he.

Echinops prionolepis Bornm. & Mattfeld / garno kanalo (sh)

CHILAS: Babusar Valley, 1350 m, *Schickhoff 1722* (!, cf.); Chilas, 1000 m, *Miehe 950103* (!); Chilas – Babusar, 1140 m (*Dickoré*). – Go: Gor – Darang, 1880 m, *Dickoré 12672* (!). – Ra: Tato – Raikot Bridge, left slope, 2050 m, *Nüsser 569* (B!). — ASTOR: Da: Ramghat, 1200-1900 m, *Troll 7909* (B, type destroyed); 1240-1330 m (*Dickoré*).

1000-2050 m / coll.-submont.: semi-desert, steppe (*Artemisia fragrans*) / Gilgit, Chilas / ENDEM / he.

Apparently endemic to the Indus gorge adjacent to Nanga Parbat, but with affinities to Pamiran taxa. Differs by its grey-tomentose leaves from the widespread and not closely related *E. cornigerus*.

Erigeron acer L. / Blue Fleabane (e)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1760* (!). – Go: Gor, 2690 m, *Schickhoff 1573* (!); 3230 m, *Schickhoff 1548* (!). – Ra: Raikot Gl. – Ganalo Gl. confluence, 3900 m, *Nüsser 290* (B, det. Wagenitz !). — ASTOR: Da: Doian, *Duthie 12456* (“cf. *E. altissimus* ined.”, Cat. Pak.); Mushkin Forest, 2580 m, *Schickhoff 1121* (!). – As: Rama, 3040 m, *E. Nasir & Webster 6461* (RAW!, “subsp. *angulosus*”); Sango Sar, 3040-3650 m, *Giles 588* (K!, “*E. alpinus* var. *multicaulis*”). – Ru: Rupal Valley, 2430 m, *E. Nasir & Webster 6499* (RAW!). – Ka: Rattu >, 2740 m, *R. R. Stewart* (RAW!, “subsp. *angulosus*”).

2430-3900 m / submont.-alp.: forest, steppe-forest (*Cedrus*, *Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / Europe, Asia, N America / CIRCPOL / he.

Erigeron anisophyllus Rech. f.

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12640* (!). — ASTOR: Da: Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 252* (B, det. Wagenitz !, cf.).

2700-2950 m / mont.: forest, moist (*Picea*, *Pinus wallichiana*) / E Afgh., W Himalaya: Swat, Astor / ENDEM / he.

Similar in habit to *E. acer*, but without filiform female flowers.

[*Erigeron bellidioides* (D. Don) Benth. & Hook. f.]

CHILAS: Ra: Raikot Valley, Kilo Sagar, 3700 m, *Troll 7787*. — ASTOR: As: Gurikot E, 3000 m, *Troll 7535*.

3000-3700 m / mont.-subalp.

Record may refer to *E. acris*.

Erigeron cyanactis Rech. f.

ASTOR: Da: Mushkin Forest, 2900 m, *Schickhoff 1392* (!); 2900 m, *Schickhoff 1403* (!, cf.); 3000 m, *Schickhoff 1420* (!); Mushkin RH <, 2580 m, *Dickoré 12725* (!). – As: Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1039* (!). – Ru: Village Lower Rupal, 3100 m, *Nüsser 1586* (B, det. Wagenitz !, cf.).

2580-3100 m / submont.-mont.: forest, moist (*Abies*, *Pinus wallichiana*, *Salix wallichiana*) / W Himalaya: E Afgh., Chitral, Astor / ENDEM / he.

A segregate of *E. acer*.

[*Erigeron himalayensis* Vierhapper]ASTOR: As: Gurikot, 2500 m, *Troll* 7536.

2500 m / submont.

Identity unknown.

[*Erigeron kumaunensis* (Vierh.) Wendelbo]CHILAS: Pa: Jiliper Valley, 3400 m, *Troll* 7658. – Ra: Fary, 3200 m, *Troll* 7816.

3200-3400 m / mont.-subalp.

Identity unknown.

[*Erigeron kunawarensis* (? ined.)]CHILAS: Bu: Buldar Valley, Mamocha Peak <, 4000 m, *Troll* 7847. — ASTOR: Ka: Kalapani Valley, 3200 m, *Troll* 8047.

3200-4000 m / mont.-alp.

Identity unknown.

[*Erigeron multiflorus* (? ined.)]CHILAS: Ra: Raikot Gl., nunatak, BC, 4000 m, *Troll* 7745.

4000 m / alp.

Identity unknown.

***Erigeron multiradiatus* Benth. & Hook. f.**

CHILAS: Go: Gor, 3230 m, *Schickhoff* 1554 (!); 3520 m, *Schickhoff* 1479 (!). – Ra: Raikot Gl., nunatak, BC, 3910 m, *Nüsser* 1287 (B, det. Wagenitz !); Raikot Valley, 3220 m, *Schickhoff* 1666 (!). — ASTOR: As: Sango Sar, 3040-3650 m, *Giles* (K!). – Ru: Latobo, Tap Gl., 4000 m, *Nüsser* 56 (B, det. Wagenitz !); Mazeno Gl., 4300 m, *Peer* (!); upper Mazeno BC, 4320 m, *Nüsser* 1469 (B, det. Wagenitz !); Zaipur >, 3120 m, *Schickhoff* 1082 (!, cf.); 3140 m, *Schickhoff* 1090 (!). – Ka: Faqirkot, 2980 m, *Schickhoff* 1312 (!). — ASTOR/DEOSAI: Burzil Chowki, 3200 m, *R. R. Stewart* 19783 (RAW!); Burzil P., *R. R. Stewart* 19878 a (RAW!); *R. R. Stewart* 22093 p.p. (K!, with *Aster flaccidus*).

2980-4320 m / mont.-alp.: forest, scree, scrub, turf (*Abies*, *Picea*, *Pinus wallichiana*) / W Himalaya: E Afgh. – Nepal / W HIM / he.

A tentative name for the species common in SW Karakorum and Inner W Himalaya. The type of *E. multiradiatus* may, however, be identical to *E. semibarbatus*; thus this taxon may require a new name.

***Erigeron semibarbatus* DC. (*E. ellisii* Hook. f., *E. roylei* DC., *E. cedretorum* Rech. f.)**

CHILAS: Go: Gor > NW, 2950 m, *Dickoré* 12634 (!). — ASTOR: As: Chillam, *R. R. Stewart* 18992 (“*E. roylei*”, Cat. Pak.); Gudai, 2640 m, 1957-08-12, *M. B. Zaman* (RAW!). — ASTOR/DEOSAI: Burzil Chowki, 3040-3350 m, *R. R. Stewart* 19821 (RAW!); 3040-3350 m, *R. R. Stewart* 19760 (RAW!); Burzil P., *R. R. & I. D. Stewart* 22043 (RAW!); Burzil P. ascent, 3650 m, *R. R. & I. D. Stewart* 19040 (RAW!); Chillam – Sochar P., 3200 m, *E. Nasir & Webster* 6523 (RAW!); Mir Panzil P., Burzil Chowki >, 1940-07-28, *R. R. Stewart* (RAW!). 2640-3650 m / submont.-subalp. / W Himalaya: E Afgh. – Nepal / W HIM / he.

***Erigeron uniflorus* L.** (*E. alpinus* var. *uniflorus* (L.) Hook. f., *E. alpinus* auct., non L., *E. wightii* DC., *E. patentisquama* J. F. Jeffrey)

CHILAS: Pa: Pattaro Valley, Guttum Sagar >, 4450 m, *Nüsser 1335* (B, det. Wagenitz !). – Ra: Bezar Gali, 3900 m, *Troll 7661*; Kosto Valley, 4300 m, *Nüsser 1418* (B!); Raikot Valley, Nunatak, 4300 m, *Troll 7767*. – Bu: Buldar Valley, Mamocha Peak <, 4200 m, *Troll 7848*. — ASTOR: As: Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit 6418* (“*E. wightii*”, Klatt 1880); Rama, R. R. & I. D. Stewart 21909 (RAW!); Rama >, 3040 m, *E. Nasir & Webster 6452* (RAW!); Sangu Sar [Sango Sar], on the right side of the Tsinger Gl. [Sachen Gl.], 1856-09-12, *Schlagintweit 6595* (“*E. wightii*”, Klatt 1880). – Ru: Latobo S, 4410 m, *Nüsser 75* (B!); Mazeno High Camp, ascent, 4600 m, *Nüsser 1501* (B!); Pattere or Nahake P., Gue [Gurikot] – Pattere, 1856-09-14, *Schlagintweit 6762* (“*E. alpinum*”, Klatt 1880); Toshain Valley, moraine, 4700 m, *Nüsser 1525* (B!). 3040-4700 m / mont.-subniv. / Europe, Asia, N America / CIRC POL / he.

***Filago arvensis* L.** (*Gnaphalium arvense* (L.) Scop.) / Field Cudweed (e)

ASTOR: As: Rama, 3040 m, R. R. Stewart 22946 (K!, RAW!, Cat. Pak.). 3040 m / mont. / N Africa, Europe, W & C. Asia / EURAS / th.

Most of the W Himalayan material has been assigned to the closely related *F. paradoxa*. *F. arvensis* s.str. is common in Chitral and W Gilgit, the Nanga Parbat specimen apparently representing one of the SE-most records.

***Filago hurdwarica* (DC.) Wagenitz** (*Gnaphalium hurdwaricum* Wall. ex DC., *F. bornmulleri* Hausskn. ex Bornm., *F. spatulata* auct., non C. Presl)

ASTOR: Da: Ramghat, 1200-1800 m, *Troll 7080* (“*F. spatulata*”).

1200-1800 m / coll.: sand, semi-desert / Iran, Afgh., W Himalaya: Chitral – Nepal / IRAN / th. Extends from the foothills along the Indus to Gilgit and Skardu.

***Filago paradoxa* Wagenitz** (*F. arvensis* auct., non L.)

CHILAS: Go: Gor, 2400 m, *Dickoré 12530* (!); Gor > NW, 2840 m, *Dickoré 12615* (!). — ASTOR: Da: Astor – Bunji, 1210-2130 m, *F. Schmid 1790* (RAW!). – As: Gurikot, 2380 m, *Nüsser 817* (B!, cf.). – Ru: Rupal Valley, Nagachakali, nunatak, 3500 m, *Nüsser 634* (B!, cf.); Zaipur >, 3120 m, *Schickhoff 1081* (! det. Wagenitz).

1210-3500 m / coll.-subalp.: steppe-forest, moist, turf (*Pinus gerardiana*, *Quercus*) / E Iran, Pamir, NE Afgh., W Himalaya / PAMIR / th.

***Galinsoga parviflora* Cav.** / Gallants-soldier (e)

ASTOR: As: Astor Bazar, Hotel, 2440 m, *Dickoré 12807* (!).

2440 m / submont.: moist, ruderal / trop. America (introduced cosmopolitan) / COSMO / th.

***Gnaphalium stewartii* C. B. Clarke** (*G. afghanicum* Rech. f.)

CHILAS: Babusar P., 4050-4100 m, *Miehe 467* (!); Babusar P. N, 3550 m, *Dickoré 12839* (!); Babusar P. NE, 4210 m, *Dickoré 12907* (!). – Ra: Raikot Gl., nunatak, BC, 4100 m, *Nüsser 481* (B!). — ASTOR: (Cat. Pak.). – As: Rama Lake nr., 3350 m, *E. Nasir & Webster 6453* (K!, RAW!). — ASTOR/DEOSAI: Burzil P. descent, 3960 m, R. R. & I. D. Stewart 19072 (RAW!).

3350-4210 m / mont.-alp.: dwarf scrub, rock, scree, turf (*Bistorta affinis*, *Juniperus communis*) / Turkey, Caucasus; SW Karakorum, W Himalaya / IRAN / he.

● *Helianthus annuus* L. / Sunflower (e)

ASTOR: Da: Turbaling – Doian, 2570 m (*Dickoré*).

2570 m / th.

Cultivated near village.

Heteropappus altaicus (Willd.) Novopokr. (*Aster altaicus* Willd., *A. spartioides* C. B. Clarke, *Calimeris canescens* Nees, *Galatella juncea* Lindl. ex Royle, *H. canescens* (Nees) Novopokr.)

CHILAS: Go: Gor, 2420 m, *Dickoré* 12656 (!); 2650 m (*Dickoré*). – Ra: Pungadori – Tato, 3120 m, *Nüsser* 559 (B!, “var. *canescens*”); Tato, 2400 m, *Troll* 7822. – Bu: Buldar Valley, 2700 m, *Troll* 7594. — ASTOR: Da: Dashkin, 1800-2100 m, *Miehe* 950201 (!); Doian, 2130 m, *Giles* 543 (K!); Mushkin Forest, 2580 m, *Schickhoff* 1118 (!); Mushkin Forest, RH – Dashkin, 2600 m, *Nüsser* 259 (B!, “var. *canescens*”); 2660 m, *Nüsser* 272 (B!, “var. *canescens*”); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser* 229 (B!, “var. *canescens*”); Ramghat, 1200-1800 m, *Troll* 7063; 1500 m (*Dickoré*). – As: Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit* 6400 (Klatt 1880); environs of Naugaum, 1856-09-15/30, *Schlagintweit* 6909 (Klatt 1880); Gudai, 2720 m, 1971-08-23, *Azim & Shaheed* (RAW!); Gue [Gurikot] – Pattere Brok, 1856-09-13, *Schlagintweit* 6213 (Klatt 1880); Sangu Sar [Sango Sar], on the right side of the Tsinger Gl; [Sachen Gl.], 1856-09-12, *Schlagintweit* 6596 (Klatt 1880). – Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit* 6881 (Klatt 1880). – Ka: Rattu, *R. R. Stewart* 18814 (Cat. Pak.); 2740 m, *R. R. Stewart* 18815 (RAW!).

1200-3120 m / coll.-mont.: forest, scrub, steppe, steppe-forest (*Cedrus*, *Juniperus excelsa*, *Picea*, *Pinus wallichiana*, *Quercus*) / Siberia, C. Asia, Iran, Afgh., Karakorum, Himalaya / C AS / he.

The majority of or all specimens may belong to var. *canescens* (Nees) Serg.

[*Hieracium korshinskyi* Zahn]

CHILAS: Ra: Fary, 3300 m, *Troll* 7821 (“subsp. *trollianum*”); Tato – Muthat, 3200 m, *Troll* 7835 (“subsp. *trollianum*”).

3200-3300 m / mont. / he.

Hieracium robustum subsp. *kashmiriense* Zahn (*H. crocatum* auct., non Fries)

ASTOR: As: Rama > 3050 m, *R. R. Stewart* 22910 (K!). — ASTOR/DEOSAI: Deosai – Chillam, *E. Nasir & Webster* 6391 (RAW!).

3050 m / mont. / NW Himalaya / W HIM / he.

Apparently intermediate between *H. umbellatum* and *H. virosum*.

[*Hieracium tschamkorijense* Zahn]

ASTOR: Ru: Rupal Valley, 3300 m, *Nüsser* 113 (B, det. Gottschlich!).

3300 m / mont. / he.

***Hieracium umbellatum* L.**

CHILAS: Ra: Tato – Muthat, 3200 m, *Troll 7835a*. — ASTOR: As: Rama, *R. R. Stewart 22910* (Cat. Pak.). — Ka: Kalapani Valley, 3300 m, *Troll 8030*; Shankargarh, *Giles 641* (Cat. Pak.). 3200-3300 m / mont. / Europe, Asia / EURAS / he.
H. umbellatum (s.str.) appears to be rare in Kashmir, records may (partly?) refer to *H. robustum*.

***Hieracium virosum* Pallas (*H. corymbosum* Baker, non Fries)**

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1740* (!). — Pa: Diamir Valley, 3150 m, *Schickhoff 2454* (!); Jiliper Valley, 2500-3000 m, *Troll 7679* (“subsp. *virosum*”). — Ra: Fary, 3200 m, *Troll 7823*. — ASTOR: Da: Harchu Valley, Karmi Haray, 2740 m, *Nüsser 829* (B, det. Gottschlich !, cf.); Mushkin Forest, 2700 m, *Troll 7890*; Mushkin Forest, RH – Dashkin, 2660 m, *Nüsser 268* (B!); Mushkin RH <, 2580 m, *Dickoré 12719* (!); Mushkin RH > SE, 2700 m, *Dickoré 12765* (!). — As: Burzil P. N, Sardar Kothi <, *R. R. Stewart 22009* (RAW!). — Ka: Faqirkot, 3220 m, *Schickhoff 1346* (!, cf.); Rattu >, *R. R. Stewart 18800* (Cat. Pak.). 2500-3220 m / submont.-mont.: forest, hay meadow (*Abies*, *Cedrus*, *Pinus wallichiana*, *Salix wallichiana*) / SE Europe, Asia / EURAS / he.

***Hieracium vulgatum* Fries (*H. levicaule* sensu Zahn, non Jordan, *H. murorum* auct., non L.)**

CHILAS: Babusar Valley, 3200 m, *Schickhoff 1697* (!). — Ra: Raikot Valley, 3220 m, *Schickhoff 1669* (!). — ASTOR: (Cat. Pak.). — As: Rama, 3040 m, *E. Nasir & Webster 6439* (RAW!); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1027* (!, cf.); 3220 m, *Schickhoff 973* (!); 3380 m, *Schickhoff 982* (!). — Ru: Gageh, 3070 m, *Nüsser 768* (B, det. Gottschlich !, cf.); Rupal Valley, Nagachakali, nunatak, 3890 m, *Nüsser 657* (B!); Zairpur >, 3120 m, *Schickhoff 1060* (!). — Ka: Faqirkot, 2980 m, *Schickhoff 1323* (!). 2980-3890 m / mont.-subalp.: forest, moraine, scrub (*Abies*, *Betula*, *Picea*, *Pinus wallichiana*) / Europe, Asia / EURAS / he.

***Inula clarkei* (Hook. f.) R. R. Stewart (*I. obtusifolia* var. *clarkei* Hook. f.)**

ASTOR: Da: Dashkin, 2430 m, *Giles 196* (K!, Cat. Pak.); Harchu, 2000 m, *Troll 7920*. 2000-2430 m / submont. / SW Karakorum, NW Himalaya / ENDEM / he.
 Differs from *I. obtusifolia* in being densely white-villous (*I. obtusifolia* is glandular pubescent) and possessing larger heads (Darwar & Qaiser 1997); status and delimitation of the taxon, as well as its possibly identity with the Pamiran *I. gombczewskyi* C. Winkler need further study.

***Inula obtusifolia* Kerner**

CHILAS: Go: Gor > NW, 2770 m, *Dickoré 12592* (!); 2950 m, *Dickoré 12631* (!). — ASTOR: Da: Doian, *Giles 554* (Cat. Pak.). — As: Gurikot (Cat. Pak.). — Ru: Rupal Valley, *R. R. Stewart* (Cat. Pak.). — Ka: Rattu (Cat. Pak.). 2770-2950 m / mont.: forest, rock, steppe-forest (*Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / Pamir, W Himalaya: Afgh. – ?Nepal / W HIM / he.

***Inula racemosa* Hook. f. (*I. royleana* C. B. Clarke, non DC.) / fantutsel (sh), poshkar (u)**
 ASTOR: *Duthie 12569* (“*I. royleana*”, Cat. Pak.). — As: Astor >, *R. R. Stewart* (Cat. Pak.);

Gurikot > (“*I. royleana*”, Cat. Pak.). – Ka: Kalapani Valley, 3200-3400 m, *Troll 8050* (“*I. royleana*”); Kamri Valley (Cat. Pak.).

3200-3400 m / mont.-subalp. / W Himalaya: Afgh. – Nepal / W HIM / he.

Medicinal. Cultivated at Chongra, 2700 m, usually at higher levels (H. Hansen, pers. comm.).

Inula rhizocephala Schrenk

CHILAS: Go: Gor, Martal, 2970 m, *Nüsser 1150* (B!). – Ra: Fairy Meadows, 3310 m, *Nüsser 361* (B!, cf., veg.). — ASTOR: As: Rama, *E. Nasir & Webster 6445* (“var. *rhizocephaloides*”, Cat. Pak.). – Ru: Rupal Valley, *R. R. Stewart 18859* (“var. *rhizocephaloides*”, Cat. Pak.). 2970-3310 m / mont.: dwarf scrub, scree, turf / N Iran, Afgh., Tian Shan, Pamir, SW Karakorum, W Himalaya / PAMIR / he.

E of Chitral the species is apparently rare and rather local. It has its E limit on Nanga Parbat, in Dras, Ladakh and Zaskar.

Koelpinia linearis Pallas

ASTOR: (Cat. Pak.). – Da: Mushkin, 1900 m, *Troll 7251*.

1900 m / coll. / N Africa, SW & C. Asia, W Himalaya / IRAN / th.

Lactuca crambifolia (Bunge) Boiss. (*Steptorhamphus crambifolia* Bunge)

ASTOR: Da: Doian, 2400-2700 m, *Troll 7214*.

2400-2700 m / submont.-mont. / Tian Shan, Pamir, Afgh., W Himalaya: Chitral, Astor, Baltistan / PAMIR / he.

Rare, also collected near Skardu (*Nasir & Webster 5835*, RAW!).

Lactuca dissecta D. Don

CHILAS: Babusar Village >, 2850 m, *Dickoré 12835* (!); Babusar Valley, 2750 m, *Schickhoff 1753* (!). – Go: Gor, Terimal, 2400-2700 m, *Troll 7129*. – Bu: Muthat – Raikot Bridge, 2330 m, *Nüsser 1048* (B!). — ASTOR: Da: Doian – Mushkin, 2000-2500 m, *Troll 7240*; Doian <, 1680 m, *Nüsser 715* (B!); Mushkin RH > SE, 2770 m, *Dickoré 12795* (!). – Ru: Churit – Bulashbar, 2480 m, *Nüsser 810* (B!).

1680-2850 m / coll.-mont.: forest, scree, steppe-forest (*Cedrus*, *Juniperus excelsa*, *Pinus wallichiana*) / Tian Shan, Pamir, Afgh., SW Karakorum, Himalaya / PAMIR / he.

Lactuca dolichophylla Kitam. (*L. longifolia* DC., non Michx., *Mulgedium sagittatum* Royle, *L. wallichiana* Tuisl)

ASTOR: Ka: Faqirkot, 2980 m, *Schickhoff 1319* (!); 2980 m, *Schickhoff 1331* (!); Kalapani, *R. R. Stewart* (Cat. Pak.).

2980 m / mont.: forest (*Pinus wallichiana*) / Himalaya: E Afgh. – Assam, China / HIMAL / he.

[*Lactuca hispida* DC.]

ASTOR: As: Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit 6384* (Klatt 1880).

Identity unknown.

Lactuca lessertiana (DC.) C. B. Clarke (*Mulgedium lessertianum* DC.)

CHILAS: Babusar P. N, 3700 m, *Dickoré 12868* (!). — ASTOR: As: Rama Valley, 3520 m, *Nüsser 157* (B!); Sango Sar, 3040-3650 m, *Giles 609* (K!). — ASTOR/KASHMIR: Kamri P., 3350-3960 m, *Giles* (K!).

3040-3960 m / mont.-alp.: alluvial fan, avalanche path, scree, turf / Himalaya: Pakistan – SE Tibet / HIMAL / he.

Lactuca orientalis (Boiss.) Boiss. (*Scariola orientalis* (Boiss.) Soják)

ASTOR: (Cat. Pak.). – Da: Astor – Harchu, 2100 m, *Troll 7916*; Dashkin – Astor, 2220 m (*Dickoré*); Doian – Ramghat, 1500-1930 m (*Dickoré*); Ramghat, 1300 m, *Troll 7052*. – As: Gurikot – Das Kirim, 2430 m, *R. R. Stewart 22960* (K!).

1300-2430 m / coll.-submont.: semi-desert, steppe / SW Asia: Syria – Afgh., SW Karakorum, W Himalaya / IRAN / ch.

[Lactuca ramosissima Benth. & Hook. f.]

ASTOR: As: Sangu Sar [Sango Sar], on the right side of the Tsinger Gl. [Sachen Gl.], 1856-09-12, *Schlagintweit 6591* (Klatt 1880). – Ru: Tap to Masenno [Mazeno] Gl. (Lolio Duru) and Ashursbott, 1856-09-17/19, *Schlagintweit 7259* (Klatt 1880); Tashing [Tarishing], 1856-09-15/22, *Schlagintweit 7402* (Klatt 1880).

Identity unknown.

Lactuca rapunculoides (DC.) C. B. Clarke (*Mulgedium rapunculoides* DC., *Cicerbita rapunculoides* (DC.) Beauv., *L. decipiens* C. B. Clarke, *Prenanthes callosa* Klatt)

ASTOR: (“*L. decipiens*”, Cat. Pak.). – Da: Mushkin RH – Turbaling, 2620 m, *Dickoré 12743* (!). – As: Astor Bazar, 2400 m, *Troll 7928* (“*L. decipiens*”); Burzil P. N, 3040-3350 m, *R. R. Stewart 22001* (K!); Chillam, *R. R. Stewart* (Cat. Pak.); Chillam – Gurikot Rd., 3040 m, *M. A. Siddiqi & al. 4199* (K!, “*L. decipiens*”); Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit 6390* (“*Prenanthes callosa*”, Klatt 1880); Gue [Gurikot] – Pattere Brok, 1856-09-13, *Schlagintweit 6220* (“*Prenanthes callosa*”, Klatt 1880). – Ru: Latobo, Tap Gl., left lateral moraine, 3660 m, *Nüsser 40* (B!, “*L. decipiens*”); Tarishing, 2910 m, *Nüsser 753* (B!, cf.); Tashing [Tarishing], 1856-09-15/22, *Schlagintweit 7405* (“*Prenanthes callosa*”, Klatt 1880); village Lower Rupal, 3100 m, *Nüsser 1598* (B!, “*L. decipiens*”); Zaipur >, 3120 m, *Schickhoff 1076* (!). – Ka: Faqirkot, 3220 m, *Schickhoff 1366* (!); 3220 m, *Schickhoff 1344* (!); Kalapani Valley, 2700-3300 m, *Troll 7999* (“var. *multifida*”); Shankargarh nr., 3040 m, *R. R. & I. D. Stewart 18755* (RAW!). — ASTOR/KASHMIR: Kamri Camp (Cat. Pak.). — ASTOR/DEOSAI: Burzil, 3200 m, 1876-07-26, *C. B. Clarke 29609* (K!, “*L. decipiens*”); Burzil Chowki – Deosai, 3650 m, *R. R. Stewart 19983* (RAW!); Burzil P., 3350 m, *R. R. Stewart 19011* (RAW!, Cat. Pak.); Chillam – Sochar, 3200 m, *E. Nasir & Webster 6522* (RAW!, Cat. Pak.).

2400-3660 m / submont.-subalp.: forest, moist (*Abies*, *Picea*, *Pinus wallichiana*, *Salix wallichiana*) / W Himalaya: Afgh. – Nepal / W HIM / he.

Lactuca serriola L. (*L. scariola* L.) / kahu (u), Prickly Lettuce (e)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1737* (!, cf.). – Go: Gor, 2420 m, *Dickoré 12657* (!). – Ra: Tato, 2400 m, *Troll 7832*. — ASTOR: As: Rampur (Kazmi & Siddiqui 1953).

2400-2750 m / submont.-mont.: forest, ruderal, scrub (*Cedrus*, *Quercus*) / Europe, Asia / EURAS / he.

Medicinal.

[*Launaea microcephala* Hook. f.]

ASTOR: Da: Doian, 2400-2800 m, *Troll* 7239.

2400-2800 m / submont.-mont.

Doubtful record. Apparently known only from the syntypes (Skardu 9000', *C. B. Clarke* 29984; 30009 (K!)), which do not belong to *Launaea*, but to *Crepis* or *Ixeris*.

Launaea oligocephala (Hausskn. & Bornm.) Bornm. (*Zollikoferia oligocephala* Hausskn. & Bornm., *Chondrilla scoparia* Rech. f. & al.)

CHILAS: Chilas, 1000 m, *Miehe* 950102 (!); Indus Valley, *Troll* (Cat. Pak.). – Go: Thelichi, 1260 m, *Dickoré* 12521 (!). — ASTOR: Da: Ramghat, 1200-1800 m, *Troll* 7053.

1000-1800 m / coll.: semi-desert / Iran, Afgh., Pakistan: Baluch., Astor, Gilgit / IRAN / ch. NE limit of area.

Leontopodium campestre (Ledeb.) Handel-Mazz. (*L. brachyactis* Gandoger)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi* & *Y. Nasir* (RAW!). – Pa: Bunar Valley, Loiba 3900 m, *Peer* (!); Diamir Valley, 3150 m, *Schickhoff* 2447 (!). – Ra: Raikot Valley, 3220 m, *Schickhoff* 1675 (!); Raikot Valley, Bayal, 3600 m, *Nüsser* 1279 (B!); Raikot Valley, Jut, 3310 m, *Nüsser* 944 (B!, cf.); Raikot Valley, Kilo Sagar, 3900 m, *Troll* 7797; Raikot Valley, Pungadori Lake, 3300 m, *Nüsser* 313 (B!); upper Rakhiot [Raikot] Valley, Buldar ridge, 3900 m, 1937-07-10, *Troll* (W!, "*L. brachyactis*" det. Handel-Mazzetti). — ASTOR: Da: Harchu Valley, Baro Nirril >, 3230 m, *Nüsser* 880 (B!, cf.). – As: Gurikot, 2900 m, *Troll* 7352; Rama Valley, left slope, 3620 m, *Nüsser* 210 (B!, cf.). – Ru: Zaipur >, 3120 m, *Schickhoff* 1066 (!); 3140 m, *Schickhoff* 1099 (!). – Ka: Faqirkot, 3450 m, *Hansen* 65 (!).

2900-3960 m / mont.-alp.: forest, meadow, scree (*Abies*, *Picea*, *Pinus wallichiana*) / Altai, Tian Shan, Pamir, SW Karakorum, W Himalaya / C AS / he.

Apparently the most common subalpine *Leontopodium* in Pamir, Hindukush, NW Himalaya and SW Karakorum.

[*Leontopodium himalayanum* DC.]

ASTOR: Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit* 6880 (Klatt 1880); Pattere or Nahake P., Gue [Gurikot] – Pattere, 1856-09-14, *Schlagintweit* 6752 (Klatt 1880); Tap to Masenno [Mazeno] Gl. (Lolio Duru) and Ashursbott, 1856-09-17/19, *Schlagintweit* 7244 (Klatt 1880); Tashing [Tarishing], 1856-09-15/22, *Schlagintweit* 7428 (Klatt 1880).

Himalaya, S & E Tibet / HIMAL / he.

May have been *L. leontopodium*. The western edge of distribution of *L. himalayanum* seems to be poorly understood. Some specimens from the Outer Himalaya may belong to here, but these are usually not typical or possibly transitional to *L. leontopodium*.

Leontopodium leontopodium (DC.) Handel-Mazz. (*Antennaria leontopodina* DC., *L. ochroleucum* Beauv.) / chukie (sh)

CHILAS: Babusar P., 4300 m, *Miehe 477* (!); *Miehe 536* (!); Babusar P. N, 3700 m, *Dickoré 12867* (!); Babusar P. NE, 4210 m, *Dickoré 12917* (!); 4210 m, *Dickoré 12935* (!). – Go: Gor, 3520 m, *Schickhoff 1493* (!). – Pa: Pattaro Valley, 3900 m, *Troll 7695*; Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser 1375b* (B!); Pattaro Valley, Guttum Sagar – Kosto Gali, 4830 m, *Nüsser 1406* (B!); Pattaro Valley, Guttum Sagar >, 4450 m, *Nüsser 1336* (B!). – Ra: Bezar Gali S, Fulu, 4180 m, *Nüsser 542* (B!); Raikot Gl., left lateral moraine, 3820 m, *Nüsser 1309* (B!); Raikot Gl., nunatak, 4120 m, *Nüsser 375* (B!); Raikot Gl., nunatak, BC, 4430 m, *Nüsser 504* (B!); Raikot Valley, Nunatak, 4400 m, *Troll 7758*. — ASTOR: As: Bulan Ridge, 4100 m, *Nüsser 177* (B!); Rama Ridge, 4000 m, *Nüsser 214* (B!); Sango Sar, 3040-3650 m, *Giles 605* (K!). – Ru: Bunar Valley, Loiba, 3900 m, *Peer 39* (!); 3900 m, *Peer 38* (!); Tarishing, 3000 m, *Troll 7501*.

3000-4830 m / mont.-subniv.: avalanche path, dwarf scrub, rock, scree, scrub, turf (*Juniperus*, *Rhododendron anthopogon*, *Salix karelinii*) / Tian Shan, Pamir, Karakorum, W Himalaya / PAMIR / he.

***Ligularia amplexicaulis* DC.**

ASTOR: Ka: Kalapani – Kamri P., 3500-4000 m, *Troll 8056* (“*L. jacquemontiana*”).
3500-4000 m / subalp.-alp. / Himalaya: Kashmir – Bhutan / HIMAL / he.

***Ligularia thomsonii* (C. B. Clarke) Kitam. (*Senecio thomsonii* C. B. Clarke) / motta kэш (sh)**

ASTOR: Ka: Kalapani, 3500 m, *Hansen 101* (!, cf.); Kalapani Valley, 3200 m, *Troll 8000*.
3200-3500 m / mont.-subalp. / SW Karakorum, W Himalaya: E Afgh., Kashmir – Nepal / W HIM / he.

***Phagnalon acuminatum* Boiss.**

ASTOR: Da: Astor – Bunji, 1300-2300 m, *F. Schmid 1814* (RAW!, Cat. Pak.); Ramghat, 1500 m, *Troll 7196* (“*P. niveum*”).
1300-2300 m / coll.-submont. / SW Karakorum, W Himalaya: E Afgh., Chitral, Gilgit, Kashmir / W HIM / ch.

The Troll specimen is doubtfully assigned here, rare. *P. niveum* Edgew. appears to be restricted to the Outer W Himalaya, but specific delimitation tentative.

***Picris nuristanica* Bornm. (*P. hieracioides* auct., non L.) / kantas (sh)**

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir* (RAW!). – Ra: Tato, 2600 m, *Troll 7824* (“*P. hieracioides*”). — ASTOR: (“*P. hieracioides*”, Cat. Pak.). – As: Astor Bazar, 2400 m, *Troll 7932* (“*P. hieracioides*”). – Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit 6862* (“*P. hieracioides*”, Klatt 1880); Rupal Valley, Bayals, 3160 m, *Nüsser 593* (B!); Tap to Masenno [Mazeno] Gl. (Lolio Duru) and Ashursbott, 1856-09-17/19, *Schlagintweit 7260* (“*P. hieracioides*”, Klatt 1880); Tashing [Tarishing], 1856-09-15/22, *Schlagintweit 7408* (“*P. hieracioides*”, Klatt 1880). – Ka: Kalapani, 3050 m, *Schickhoff 1271* (!); Rattu, 2700 m, *Troll 7970* (“*P. hieracioides*”).
2400-3960 m / submont.-alp.: dwarf scrub, ruderal, scree (*Artemisia santolinifolia*) / Tian Shan, Afgh., SW Karakorum, W Himalaya / PAMIR / he.

Pseudognaphalium luteo-album (L.) Hilliard & B. L. Burt (*Gnaphalium luteo-album* L.) / Jersey Cudweed (e)

CHILAS: Go: Thelichi, 1260 m, *Dickoré 12515* (!). — ASTOR: *Duthie 12298* (“var. *pallidum*”, Cat. Pak.). — Da: Ramghat (“var. *pallidum*”, Cat. Pak.).

1260 m / coll.: moist, sand, semi-desert / Africa, Europe, Asia, Australia / EURAS / th.

Psychrogeton andryaloides (DC.) Novopokr. ex Krasch. / sath ashin (sh)

CHILAS: Ra: Raikot Gl. tongue, 3230 m, *Nüsser 1007* (B!). — ASTOR: Da: Harchu Valley, Baro Nirril >, 3220 m, *Nüsser 868* (B!). — As: Chongra, 3000 m, *Hansen 204* (!). — Ru: Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1536* (B!); Tarishing, *Duthie 12504* (“var. *andryaloides*”, Cat. Pak.); 3000 m, *Troll 7399*.

3000-3950 m / mont.-alp.: gravel below glacier tongue, scree / N Iran, Afgh., Pamir, SW Karakorum, W Himalaya / PAMIR / he.

Pterachaenia stewartii (Hook. f.) R. R. Stewart (*Scorzonera stewartii* Hook. f.)

ASTOR: Da: Ramghat, 1200-1800 m, *Troll 7053a*.

1200-1800 m / coll. / E Afgh., NW Pakistan / W HIM / he.

Pulicaria salviaefolia Bunge

ASTOR: Da: Astor – Bunji, 1210-2130 m, 1954-05-28, *F. Schmid* (RAW!); Ramghat Camping Ground, 1520-1820 m, 1892-07-28, *Duthie 12284* (K!, Cat. Pak.).

1210-2130 m / coll.-submont.: rock, scree, semi-desert, steppe / Tian Shan, Pamir, N Iran, Afgh., Chitral, Gilgit / PAMIR / ch.

Also rare in Gilgit, E limit of distribution.

Saussurea atkinsonii C. B. Clarke

ASTOR/KASHMIR: Kamri P., *Duthie 12577* (Cat. Pak.); 3650-3960 m, 1892-08-26, *Duthie* (BM!). — ASTOR/DEOSAI: Burzil P., 3960 m, 1893-09-14, *Duthie 14044* (BM!); 4260 m, *R. R. Stewart 19047* (RAW!).

3650-4260 m / subalp.-alp.: meadow, scree, turf / W Himalaya / W HIM / he.

NW limit of distribution.

Saussurea candolleana (Wall. ex DC.) C. B. Clarke (*Aplotaxis candolleana* DC., *S. pterocaulon* Decne.)

ASTOR: As: Chongra Valley, 3350 m, *Lankester & Pearson 1510* (BM!). — Ru: Rupal Valley, *R. R. Stewart* (Cat. Pak.). — Ka: Kalapani, 3350-3650 m, 1892-08-25, *Duthie* (RAW!); Kalapani Valley, 3200 m, *Troll 8006*; Rattu Valley, *Duthie 12506* (Cat. Pak.). — ASTOR/DEOSAI: Burzil Chowki, 3350 m, 1940-07-26, *R. R. Stewart* (RAW!).

3200-3650 m / mont.-subalp.: dwarf scrub, scree / SW Karakorum, Himalaya: Swat – Bhu-tan / W HIM / he.

Saussurea ceratocarpa Decne. (*Jurinea ceratocarpa* (Decne.) Benth. & Hook. f.)

CHILAS: Go: Gor, 2940 m (*Dickoré*); Gor > NW, 2900 m, *Dickoré 12617* (!). — ASTOR: Ka: Kalapani Valley, 3400 m, *Troll 8037*. — ASTOR/DEOSAI: Burzil P., 2810 m, *C.B. Clarke 29589* (BM!).

2810-3400 m / mont.-subalp.: forest, rock, steppe-forest (*Picea*, *Pinus wallichiana*) / S Karakorum, W Himalaya: Swat – Himachal Pradesh / W HIM / th.

Saussurea chenopodiifolia Klatt (*S. albescens* auct., non (DC.) Sch. Bip., *S. decurrens* Hemsley, non C. Winkler)

CHILAS: Bu: Muthat, 2900 m, *Troll* 7839. — ASTOR: Da: Dashkin, 2280 m, *Giles* 565 (K!, “var. *incisifolia*”, Cat. Pak.); Harchu Valley, Karmi Haray, 2740 m, *Nüsser* 828 (B!, cf.); Mushkin RH – Turbaling, 2620 m, *Dickoré* 12742 (!). — As: Das via Goltere or Naugaum to Hasora or Astor, 2160-3320 m, 1856-09-08/20, *Schlagintweit* 6410 (Klatt 1880); Gudai, 2430 m, *R. R. & I. D. Stewart* 18949 (RAW!, Cat. Pak.); 2640 m, 1957-08-12, *Bot. Survey Med.* (RAW!); Gurikot – Gudai, 2430 m, *E. Nasir & Webster* 6505 (BM!, RAW!); Gurikot, 5 miles E, 2590-2740 m, *E. Nasir & Webster* 6505 (K!). — Ru: Chugam, 2600 m, *Troll* 7946 (“*S. albescens*”); environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit* 6847 (BM!, type of *Saussurea chenopodiifolia* Klatt; Klatt 1880); Rehmanpur, 2600 m, *Troll* 7945; Rupal Valley, *R. R. Stewart* 22857a (Cat. Pak.); Tashing [Tarishing], 1856-09-15/22, *Schlagintweit* 7411 (BM!, Klatt 1880).

2160-3320 m / submont.-mont.: forb, forest, hay meadow, roadside (*Pinus wallichiana*, *Salix wallichiana*) / SW Karakorum (Gilgit, Hunza, Baltistan), NW Himalaya (Astor, Dras) / ENDEM / he.

Close to *S. albescens*, but possibly forming a distinct population of relatively glabrous plants in the inner ranges.

Saussurea costus (Falconer) Lipschitz (*S. lappa* (Decne.) Sch. Bip.) / kut (sh)

ASTOR: As: Gudai (Kazmi & Siddiqui 1953). — Ru: Mir Malik (Kazmi & Siddiqui 1953). — Ka: Chittinadi (Kazmi & Siddiqui 1953); Kalapani (Kazmi & Siddiqui 1953); Kalapani Valley, 3300 m, *Troll* 8027; Rattu (Cat. Pak.); Steanmarg (Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil, 3440 m, 1876-07-28, *C. B. Clarke* 29729 (BM!, K!).

3300-3440 m / mont.-subalp. / W Himalaya: Astor, Kashmir / ENDEM / he.

Medicinal, formerly an important item of trade and smuggle, endangered. Cultivated for Aga Khan Rural Support Programme in Chongra (H. Hansen, pers. comm.).

Saussurea falconeri Hook. f. (*S. crassicaulis* C. B. Clarke ex Pamp.)

CHILAS: Babusar P. (Cat. Pak.); 4050 m, *Miehe* 447 (!); Babusar P. NE, 4210 m, *Dickoré* 12872 (!). — Pa: Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser* 1379 (B!). — Ra: Raikot Gl., nunatak, 3960 m, *Nüsser* 417 (B!); Raikot Valley, Nunatak, 3900 m, *Troll* 7796. — ASTOR: Da: Doian Ridge, 4000 m, *Troll* 7879. — As: Bulan Ridge, 4180 m, *Nüsser* 181 (B!); Rama Valley, 3960 m, *Lankester & Pearson* 1385 (BM!). — Ru: Mazeno terminal moraine, 4300 m, *Peer* 20 (!); Rupal Valley, Nagachakali, nunatak, 3870 m, *Nüsser* 624 (B!); upper Mazeno BC, 4320 m, *Nüsser* 1483 (B!). — Ka: Kalapani – Kamri P., 3800 m, *Troll* 8060. — ASTOR/KASHMIR: Kamri P., *R. R. Stewart* 18627 (RAW!). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart* 19901 (RAW!); Chillam – Sochar P., 3350-3650 m, *E. Nasir & Webster* 6518 (RAW!).

3350-4490 m / mont.-alp.: dwarf scrub, rock, scree, scrub, turf (*Rhododendron anthopogon*, *Salix karelinii*) / S Karakorum, W Himalaya: Astor, Kashmir, Zankar / W HIM / he.

A dwarf vicariant of *S. roylei* on the inner ranges of W Himalaya and S Karakorum.

Saussurea gnaphalodes (Royle) Sch. Bip. (*Aplotaxis gnaphalodes* Royle, *S. sorocephala* Schrenk)

CHILAS: Babusar P., 4300 m, *Miehe 558* (!); Babusar P. NE, 4210 m, *Dickoré 12894* (!, cf.). — ASTOR: As: Chongra Valley, 4260 m, *Lankester & Pearson 1523* (BM!). — Ru: Toshain Valley, ascent to Mazeno Gali, 5300 m, *Nüsser 1514* (B!).
4210-5300 m / alp.-subniv.: dwarf scrub, rock, scree / C. Asia, Pamir, Karakorum, Tibet, Himalaya / TIBET / he.
Medicinal.

Saussurea heteromalla (D. Don) Handel-Mazz. (*Carduus heteromalla* D. Don, *Aplotaxis candicans* DC., *S. brahuica* Boiss., *S. candicans* (DC.) C. B. Clarke, *S. brassicifolia* (Bornm.) Rech. f.)

CHILAS: Bu: Muthat – Raikot Bridge, 2280 m, *Nüsser 1053* (B!). — ASTOR: Da: Ramghat, 1500-1900 m, *Troll 7195*.
1500-2280 m / coll.-submont.: rock, steppe / Himalaya: Afgh. – Bhutan / HIMAL / he.

Saussurea jacea (Klotzsch) C. B. Clarke (*Aplotaxis jacea* Klotzsch) / luzumo (sh)

CHILAS: Ra: Bezar Gali – Fairy Meadows, 3510 m, *Nüsser 551* (B!); Tato – Fairy Meadows, 2800 m, *Nüsser 973* (B!, cf., veg.). — Bu: Muthat – Chwar, 2800 m, *Troll 7840*.
2800-3510 m / mont.-subalp.: forb, scree / ?Pamir, NE Afgh., SW Karakorum, W Himalaya / W HIM / he.

Saussurea roylei (DC.) Sch. Bip. (*Aplotaxis roylei* DC.)

ASTOR/KASHMIR: Kamri P., 3350-3650 m, *Giles 689* (K!); Kamri P. top, 4260 m, *R. R. Stewart & E. Nasir 22675* (BM!). — ASTOR/DEOSAI: Burzil P. (Cat. Pak.).
3350-4260 m / mont.-alp. / W Himalaya: Kashmir – Nepal / W HIM / he.
More robust than *S. falconeri* but difficult to distinguish in area of contact, vicarious in the Outer Kashmir-Himalaya.

[*Scorzonera purpurea* L.]

ASTOR/DEOSAI: Burzil P., *C. B. Clarke 29619a & c* (Cat. Pak.).
EURAS / Probably related to *S. virgata*, the flowers often change to red on drying.

Scorzonera virgata DC. (*S. divaricata* sensu Hook. f., non Turcz., *S. hondae* Kitam.) / dundely, maicher (sh)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1763* (!); 3200 m, *Schickhoff 1718* (!). — Go: Gor, 2900 m (*Dickoré*). — Pa: Diamir Valley, 2970 m, *Schickhoff 2416* (!). — Ra: Raikot Valley, 3220 m, *Schickhoff 1685* (!). — Bu: Muthat, 2700 m, *Troll 7595* ("*S. divaricata*"). — ASTOR: Da: Doian, 2380 m (*Dickoré*); 2430-2740 m, *Giles 213* (K!); Mushkin Forest, 2900 m, *Schickhoff 1385* (!); 3000 m (*Schickhoff 1419*). — As: Das Kirim Valley, Chilim >, 3100 m, *Miehe 950702* (!); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1029* (!). — Ru: Rupal Valley, 3300 m, *Nüsser 119* (B!); Mazeno Gl., 4200 m, *Peer* (!); Tap to Masenno [Mazeno] Gl. (Lolio Duru) and Ashursbott, 1856-09-17/19, *Schlagintweit 7261* ("*S. divaricata*", Klatt 1880); Zaipur >, 3120 m, *Schickhoff 1055* (!); 3140 m, *Schickhoff 1089* (!). —

Ka: Faqirkot, 2800 m, *Hansen 61* (!); 2980 m, *Schickhoff 1307* (!); 3220 m, *Schickhoff 1364* (!); upper Astor Valley, *M. A. Siddiqi* (Cat. Pak.). — ASTOR/DEOSAI: Burzil, 3200 m, 1876-07-26, *C. B. Clarke 29619* (K!); Burzil Chowki, 3350-3650 m, *R. R. & I. D. Stewart 19127* (RAW!); Chillam Chowki, 3040 m, *M. A. Siddiqi 4206* (K!).

2380-4200 m / submont.-subalp.: forest, steppe-forest (*Abies*, *Cedrus*, *Picea*, *Pinus wallichiana*) / S Karakorum, W Himalaya: E Afgh. – Kashmir / W HIM / he.

[*Senecio analogus* DC. (*S. chrysanthemoides* DC., non Schrank, *S. sisymbriiformis* DC., *S. laetus* Edgew.)]

ASTOR: (Cat. Pak.). – As: Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit 6423* (Klatt 1880); environs of Naugaum, 1856-09-15/30, *Schlagintweit 6908* (Klatt 1880); Sangu Sar [Sango Sar], on the right side of the Tsinger Gl. [Sachen Gl.], 1856-09-12, *Schlagintweit 6581* (Klatt 1880). – Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit 6868* (Klatt 1880); 1856-09-16/24, *Schlagintweit 6892* (Klatt 1880); N foot of the Dorikon P. (slopes towards Tashing), 1856-10-01, *Schlagintweit 6827* (Klatt 1880); Pattere or Nahake P., Gue [Gurikot] – Pattere, 1856-09-14, *Schlagintweit 6750* (Klatt 1880); Tap to Masenno [Mazeno] Gl. (Lolio Duru) and Ashursbott, 1856-09-17/19, *Schlagintweit 7253* (Klatt 1880). – Ka: Kalapani Valley, 2800-3300 m, *Troll 8009*.

2800-3300 m / mont. / Himalaya: E Afgh. – SE Tibet, SW China / HIMAL / he.

Klatt's records (as *S. sisymbriiformis*) may refer to *S. korshinskyi* or *S. tibeticus*, though *S. analogus* s.str. may be expected near the Kashmir border.

Senecio glaucus L. (*S. coronopifolius* Desf., non Burm. f., *S. subdentatus* Ledeb., *S. desfontainei* Druce)

CHILAS: Go: Gor Gali, 2700 m, *Troll 7111*. — ASTOR: (Cat. Pak.). – Da: Astor – Bunji, 1210-2130 m, *F. Schmid* (RAW!); Doian <, 1680 m, *Nüsser 716* (B!); Ramghat, 1200-1800 m, *Troll 7064*. – As: Rattu – Gurikot, 2500-2800 m, *F. Schmid 1773* (RAW!). 1200-2800 m / coll.-mont.: ruderal, sand, semi-desert / Canaries, Medit., S Europe, S, W & C. Asia / MEDIT / th.

Senecio korshinskyi Krasch.

ASTOR: As: Gudai, 2740 m, *R. R. & I. D. Stewart 18948* (RAW!). – Ru: Rupal Valley, 3300 m, *Nüsser 112* (B!); Tarishing, Chungphar Gl. moraine, 2910 m, *Nüsser 665* (B!); village Lower Rupal, 3100 m, *Nüsser 1594* (B!). – Ka: Faqirkot, 3220 m, *Schickhoff 1351* (!, cf.); 3220 m, *Schickhoff 1347* (!, cf.); Kalapani, 3050 m, *Schickhoff 1256* (!); 3260 m, *Schickhoff 1211* (!). — ASTOR/DEOSAI: Burzil Chowki <, 3040-3350 m, *R. R. Stewart* (RAW!).

2740-3350 m / mont.: dwarf scrub, forest (*Abies*, *Artemisia santolinifolia*, *Pinus wallichiana*) / Pamir, SW Karakorum, W Himalaya: E Afgh. – Kashmir / PAMIR / he.

Senecio krascheninnikovii Schischk. / dundely (sh)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1739* (!). – Go: Gor, 2900 m (*Dickoré*). – Pa: Pattaro Valley, Zangal, 2600 m, *Troll 7707a* ("*S. pedunculatus*"); 2700 m, *Troll 7701* ("*S. pedunculatus*"). – Ra: Tato – Fairy Meadows, 2670 m, *Nüsser 967* (B!, cf.). — ASTOR: (Cat. Pak.). – Ru: Rupal Valley, Bayals, 3160 m, *Nüsser 596* (B!). – Ka: Shankargarh, 3040 m, *R.*

R. & I. D. Stewart 18749 (RAW!).

2600-3160 m / submont.-mont.: forest, steppe, steppe-forest (*Cedrus, Juniperus excelsa*) / Tian Shan, Pamir, Karakorum, W Himalaya / PAMIR / th.

A tiny montane vicariant of *S. glaucus*.

[*Senecio nudicaulis* Ham. ex D. Don (*S. pallens* Wall. ex C. B. Clarke)]

ASTOR: *R. R. Stewart* (Cat. Pak.).

Himalaya: E Afgh. – SW China / HIMAL / he.

The record probably refers to *S. korshinskyi*, though the species is common in the Outer Himalaya and may be expected along the Indus.

Senecio tibeticus Hook. f.

CHILAS: Bu: Buldar Valley, Mamocha Peak <, 4000-4200 m, *Troll 7866*; Lichar Valley, 3000-3500 m, *Troll 7575*. — ASTOR: Da: Mushkin Forest, 3000 m, *Schickhoff 1450* (!). — As: Das Kirim – Sardar Kothi, *R. R. Stewart 22033* (RAW!); Gurikot, 2400 m, *Troll 7556*; Sango Sar, 3040-3350 m, *Giles 587* (K!, Cat. Pak.). — Ru: Mazeno Gl., 4200 m, *Peer* (!); Rupal Valley, lower Mazeno BC moraine, 4050 m, *Nüsser 1528* (B!). — Ka: Rattu, 2800 m, *Troll 7967*; Shankargarh, *Giles 9* (Cat. Pak.). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19008* (Cat. Pak.).

2400-4200 m / submont.-alp.: forest (*Pinus wallichiana*) / W Himalaya: Chitral, Astor, Deosai, Ladakh / ENDEM / he.

Usually distinctive, but apparently not always clearly defined against *S. korshinskyi*.

Solidago virgaurea L. / Goldenrod (e)

CHILAS: Ra: Fary, 3100 m, *Troll 7831a*; Raikot Valley, 3230 m, *Schickhoff 1615* (!); 3560 m, *Schickhoff 1649* (!); Raikot Valley, Bezar, 3500 m, *Troll 7646*. — ASTOR: (Cat. Pak.). — As: Chillam, 2740 m, *E. Nasir & Webster 6410* (RAW!); Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit* (Klatt 1880); Rama, 3040 m, *E. Nasir & Webster 6435* (RAW!); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1034* (!); 3220 m, *Schickhoff 974* (!); 3380 m, *Schickhoff 985* (!). — Ka: Faqirkot, 2980 m, *Schickhoff 1325* (!); 3220 m, *Schickhoff 1350* (!).

2740-3560 m / mont.-subalp.: forest (*Abies, Betula, Pinus wallichiana*) / Europe, Asia, S to C. Himalaya / EURAS / he.

Medicinal. Plants with relatively few and large heads, but apparently not clearly separable from small-headed populations in the W Himalaya.

Sonchus wightianus DC (*S. arvensis* auct., non L.) / Perennial Sow-thistle (e)

CHILAS: Go: Gor, Ranote, 2120 m, *Nüsser 1201* (B!, cf.). — ASTOR: Da: Ramghat, 1300 m, *Troll 7912*.

1300-2120 m / coll.-submont.: ruderal / Afgh., Pakistan – China, SE Asia / HIMAL / he.

Soroseri deasyi (S. Moore) Stebbins (*Lactuca deasyi* S. Moore)

ASTOR/DEOSAI: Burzil P., 4260 m, *R. R. & I. D. Stewart & E. Nasir 22038* (K!, RAW!, Cat. Pak.); Chota Deosai P., 4260 m, *R. R. Stewart 19927* (RAW!).

4260 m / alp.: gravel slide / W Himalaya: Astor, Deosai, Kashmir – Nepal / W HIM / th.
The species may be included in *S. glomerata* Decne.

Tanacetum artemisioides Sch. Bip. ex Hook. f. (*Chrysanthemum artemisioides* (Less.) Kitam., *C. karakoramense* Kitam.)

CHILAS: Babusar Valley, 1900 m, *Schickhoff 1727* (!). – Go: Gor, 2420 m, *Dickoré 12662* (!). – Pa: Jiliper Valley, 2900-3500 m, *Troll 7664*. – Ra: Bezar Gali – Fairy Meadows, 3390 m, *Nüsser 557* (B!). — ASTOR: Da: Mushkin Forest, 2740-3040 m, 1892-07-27, *Duthie* (K!); Mushkin Forest, RH – Dashkin, 2690 m, *Nüsser 277* (B!).

1900-3500 m / coll.-subalp.: roadside, scrub, steppe (*Artemisia fragrans*, *Quercus*) / SW Karakorum, W Himalaya / W HIM / ch.

Closely related to *T. fruticulosum* (*T. sect. Ajanina*).

Tanacetum dolichophyllum (Kitam.) Kitam. (*Chrysanthemum dolichophyllum* Kitam., *Hippolytia dolichophylla* (Kitam.) K. Bremer & C. J. Humphries, *C. longifolium* (Wall. ex DC.) Rech. f., *H. longifolia* (Wall. ex DC.) Poljak., *T. longifolium* Wall. ex DC., non Thunb.)

CHILAS: Bu: Buldar Valley, Mamocha Peak <, 4200 m, *Troll 7853*; Lichar Valley, 3200 m, *Troll 7587*. — ASTOR: R. R. Stewart 19088 (Cat. Pak.). – As: Bulan Ridge, 4100 m, *Nüsser 174* (B!); Sango Sar, 3050-3650 m, *Giles 608* (K!). – Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit 6876* (Klatt 1880). – Ka: Kalapani, Rattak, 3800 m, *Hansen 87* (!). — ASTOR/DEOSAI: Burzil, 3540 m, 1876-07-28, *C. B. Clarke 29689* (K!, Cat. Pak.).

3050-4200 m / mont.-alp.: dwarf scrub (*Rhododendron anthopogon*, *Salix karelinii*) / Himalaya: Swat, Kashmir – Nepal, W China / HIMAL / he.

Tanacetum griffithii (C. B. Clarke) Muradyan (*Chrysanthemum griffithii* C. B. Clarke, *Spathipappus griffithii* (C. B. Clarke) Tzvelev, *C. stoliczkae* auct., non C. B. Clarke)

ASTOR: As: Gurikot E, 2800 m, *Troll 7356* (“*C. stoliczkae*”). – Ka: Shankargarh, 2740 m, *Giles 638* (K!).

2740-2800 m / mont. / SW Karakorum, W Himalaya: E Afgh., Chitral, Dras, Ladakh / W HIM / ch.

The nomenclatural situation is extremely complex (see also *T. pyrethroides*). It seems that *T. stoliczkae* (C. B. Clarke) R. Khan originally refers to a different, more shrubby plant, which later became known as *C. tibeticum* C. B. Clarke, *T. baltistanicum* Podlech, or *T. gilgiti* R. Khan.

Tanacetum pyrethroides (Kar. & Kir.) Sch. Bip. (*Richteria pyrethroides* Kar. & Kir.) / katsh (sh)

ASTOR: (Cat. Pak.). – Da: Dashkin – Luskum, 2300 m, *Troll 7280*. – Ru: Latobo, Tap Gl., 3920 m, *Nüsser 51* (B!); Rupal Valley, lower Mazeno BC moraine, 4050 m, *Nüsser 1530* (B!). – Ka: Faqirkot, 2800 m, *Hansen 56* (!); Rattu, 2740 m, *R. R. Stewart 18823* (RAW!); Rattu, Kamri Valley, 1901-07-08, *Inayat 25662* (K!).

2300-4050 m / submont.-alp. / C. Asia, NE Afgh., Karakorum, W Himalaya / C AS / he.

The degree of pubescence is extremely variable. May have been mixed up in part with *T. griffithii* (at lower altitudes?).

Tanacetum senecionis (Jacquem. ex Besser) DC. (*Artemisia senecionis* Jacquem. ex Besser, *T. tomentosum* DC., *Hippolytia tomentosa* (DC.) Tzvelev, *H. senecionis* (Jacquem. ex Besser) K. Bremer & C. J. Humphries) / piyalo (sh)

CHILAS: Babusar P., 4050 m, *Miehe 453* (!); 4300 m, *Miehe 492* (!). – Go: Gor, 3520 m, *Schickhoff 1476* (!); Gor, Kahlimay, 3610 m, *Nüsser 1086* (B!). – Pa: Diamir Valley, 3150 m, *Schickhoff 2452* (!); Pattaro Valley, Guttum Sagar >, 4450 m, *Nüsser 1342* (B!). – Ra: Bezar Gali, 3800 m, *Troll 7662*; Bezar Gali E, Sagar, 3750 m, *Nüsser 536* (B!); Raikot Gl., nunatak, 4210 m, *Nüsser 406* (B!); Raikot Gl., nunatak, BC, 3970 m, *Nüsser 448* (B!). — ASTOR: As: Bulan Ridge, 4100 m, *Nüsser 175* (B!); 4180 m, *Nüsser 180* (B!); Chillam, R. R. Stewart 18997 (“*T. falconeri*”, Cat. Pak.); Chongra, 3700 m, *Hansen 193* (!); Rama Valley, Sachen Gl. <, 3380 m, *Schickhoff 997* (!). – Ru: Latobo S, 4120 m, *Nüsser 65* (B!); upper Mazeno BC, 4320 m, *Nüsser 1466* (B!); Rupal Valley, 3800 m, *Peer* (!); Zaipur >, 3120 m, *Schickhoff 1053* (!). – Ka: Faqirkot, 3220 m, *Schickhoff 1363* (!); Faqirkot – Chuno, 3800 m, *Hansen 173* (!). — ASTOR/DEOSAI: Burzil, 3200 m, 1876-07-26, C. B. Clarke 29611 (K!); 3350 m, *Coventry 1528* (K!, “*T. falconeri*”, Cat. Pak.).

3120-4450 m / mont.-alp.: dwarf scrub, forest, meadow, scrub (*Abies*, *Betula*, *Picea*, *Pinus wallichiana*, *Rhododendron anthopogon*, *Salix karelinii*) / W Himalaya: NE Afgh., Chitral – Kashmir, SW Karakorum / W HIM / he.

Taraxacum bessarabicum (Hornem.) Handel-Mazz.

ASTOR: Ru: Tashing [Tarishing], *Schlagintweit 12758* (Cat. Pak.); *Schlagintweit 7418* (Cat. Pak.). SE Europe, Asia / EURAS / he.
Belongs to *T.* sect. *Leptocephala*.

[*Taraxacum bhutanicum* v. Soest]

ASTOR: As: Rama Valley, left slope, 3620 m, *Nüsser 211* (B, det. Doll !, cf.). 3620 m / subalp. / he.

Taraxacum dissectum (Ledeb.) Ledeb.

CHILAS: Ra: Bezar Gali E, Sagar, 3750 m, *Nüsser 533* (B, det. Doll !). 3750 m / subalp. / C. Asia, Karakorum, W Himalaya / C AS / he.
Belongs to *T.* sect. *Dissecta*.

Taraxacum eriopodum (D. Don) DC. (*Leontodon eriopodum* D. Don)

CHILAS: Ra: Raikot Valley, 3220 m, *Schickhoff 1667* (det. Doll !). — ASTOR: As: Rama Ridge, 4000 m, *Nüsser 213* (B, det. Doll !). 3220-4000 m / mont.-alp.: rocky slope / Himalaya, Tibet, W China / HIMAL / he.
Belongs to *T.* sect. *Tibetana*.

[*Taraxacum heteroloma* Handel-Mazz.]

ASTOR/KASHMIR: Kamri P., R. R. Stewart 18711 (? also under *T. stenolepium*, Cat. Pak.).

Taraxacum himalaicum v. Soest

CHILAS: Ra: Fairy Meadows, 3310 m, *Nüsser 367* (B, det. Doll !); 3310 m, *Nüsser 363* (B, det.

Doll !); Raikot Valley, Batharet, 3410 m, *Nüsser 996* (B, det. Doll !). — ASTOR: Da: Harchu Valley, Karmi Haray, 2740 m, *Nüsser 826* (B, det. Doll !). — As: Rama Valley, near Sango Sar, 3500 m, *Nüsser 154* (B, det. Doll !). — Ru: Upper Mazeno BC, 4320 m, *Nüsser 1459* (B, det. Doll!). 2740-4320 m / mont.-alp.: hay meadow, moist / W Himalaya: Afgh. — Nepal / W HIM / he. Belongs to *T. sect. Sinensia*.

Taraxacum kashmirens v. Soest

ASTOR/DEOSAI: Burzil P., *R. R. Stewart 27068* (Cat. Pak.).

mont.-alp. / Astor, Kashmir / ENDEM / he.

The record “Kamri Valley, 3300-4300 m, *Duthie*” (Cat. Pak.) apparently refers to a specimen of *T. stenolepium*.

[*Taraxacum lahulense* v. Soest]

CHILAS: Ra: Raikot Valley, Pungadori, 3240 m, *Nüsser 912* (B, det. Doll !, cf.).

3240 m / mont.: meadow / he.

[*Taraxacum melleum* v. Soest]

CHILAS: Ra: Raikot Valley, Bayal, 3600 m, *Nüsser 1268* (B, det. Doll !, cf.).

3600 m / subalp.: meadow / he.

Belongs to *T. sect. Orientalia*.

Taraxacum nasiri v. Soest

ASTOR: Ru: Bazhin Lake, 3520 m, *Nüsser 4* (B, det. Doll !, cf.). — ASTOR/KASHMIR: Kamri P., 3300 m, *Nasir & R. R. Stewart 22665* (type of *T. nasiri* v. Soest, Cat. Pak.).

3300-3520 m / mont.-subalp. / W Himalaya: Swat – Kashmir / W HIM / he.

Belongs to *T. sect. Tibetana*.

Taraxacum pseudo-stevenii v. Soest

CHILAS: Ra: Kosto Valley, 4300 m, *Nüsser 1417* (B, det. Doll !).

4300 m / alp. / NW Himalaya / ENDEM / he.

Belongs to *T. sect. Tibetana*.

Taraxacum pubens v. Soest

ASTOR: Ru: Rupal Valley, Nagachakali, nunatak, 3440 m, *Nüsser 599 a* (B, det. Doll !).

3440 m / subalp.: turf / Iran, Afgh., SW Karakorum, W Himalaya / IRAN / he.

Belongs to *T. sect. Orientalia*.

Taraxacum staticifolium v. Soest

ASTOR/DEOSAI: Burzil Chowki, 3300 m, *R. R. Stewart 19770* (RAW!, Cat. Pak.).

3300 m / mont. / W Himalaya / W HIM / he.

Similar to *T. stenolepium*.

Taraxacum stenolepium Handel-Mazz.

ASTOR: Ka: Kalapani, 3040-3350 m, 1892-08-25, *Duthie* (K!, “*T. kashmirens*”). —

ASTOR/KASHMIR: Kamri P., 3650 m, *R. R. Stewart 18711* (RAW!, Cat. Pak.).
3040-3650 m / mont.-subalp. / SW Karakorum, W Himalaya: Afgh. – Kashmir / W HIM / he.
Belongs to *T.* sect. *Orientalia*. One of the more distinctive species, with very narrow arrow-like leaves.

Taraxacum stereodiforme v. Soest

CHILAS: Ra: Raikot Valley, Pungadori, 3290 m, *Nüsser 337* (B, det. Doll !, cf.).
3290 m / mont. / NW Himalaya / ENDEM / he.
Belongs to *T.* sect. *Kashmirana*.

Tragopogon gracilis D. Don (*T. collinus* DC. s. l.)

ASTOR: Da: Doian, 2000-2700 m, *Troll 7213*.
2000-2700 m / submont.-mont. / Pamir, Afgh., W Himalaya: Afgh. – Nepal / W HIM / ge.

Tragopogon pratensis L. / Goat's-beard (e)

ASTOR: Ka: Kalapani Valley, 3400 m, *Troll 8049*.
3400 m / subalp. / Europe, Asia / EURAS / he.
The record may refer to *T. dubius* Scop. (incl. ? *T. afghanicus* Rech. f. & Koeie, ? *T. vvedenskyi* M. Popov ex Pavlov).

Tricholepis tibetica Hook. f. & Thomson

CHILAS: Bu: Muthat – Raikot Bridge, 2280 m, *Nüsser 1055* (B!). — ASTOR: Da: Doian, 2130 m, *Giles 550* (K!, Cat. Pak.); Ramghat, 1200-1800 m, *Troll 7908*; 1500-1900 m, *Troll 7200*.
1200-2280 m / coll.-submont.: rock, semi-desert / SW Karakorum (Gilgit, Baltistan), W Himalaya (Astor) / ENDEM / ch.

Tussilago farfara L. / weypa-tey (sh), watpana (u), Colt's-foot (e)

CHILAS: Ra: Tato – Fairy Meadows, 2670 m, *Nüsser 966* (B!). — ASTOR: Da: Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 249* (B!). – As: Astor, 2310 m (Kazmi & Siddiqui 1953). – Ru: Gageh, 3080 m, *Nüsser 766* (B!).
2310-3080 m / submont.-mont.: hay-meadow, moist, ruderal, scree / N Africa, Europe, Asia (introduced N America) / EURAS / ge.
Medicinal.

Waldheimia nivea (Hook. f. & Thomson) Regel (*Allardia nivea* C. B. Clarke)

CHILAS: Pa: Bunar – Mazeno, 4400 m, *Peer 35* (!). – Ra: Raikot Gl. – Ganalo Gl. confluence, 3890 m, *Nüsser 294* (B!); Raikot Valley, Kilo Sagar, 4000 m, *Troll 7782*. — ASTOR: Ru: Bunar-Mazeno terminal moraine, 4400 m, *Peer 35* (!); Latobo, Tap Gl., 4000 m, *Nüsser 61* (B!).
3890-4400 m / subalp.-alp.: scree / Karakorum, W Himalaya: NE Afgh., Kashmir – Nepal / W HIM / he.

Waldheimia tomentosa (Decne.) Regel (*Allardia tomentosa* Decne.)

CHILAS: Ra: Kosto Valley, 4300 m, *Nüsser 1414* (B!); Raikot Gl., 3700-4000 m, *Troll 7619*; Raikot Gl. – Ganalo Gl. confluence, 3900 m, *Nüsser 288* (B!); Raikot Gl., nunatak, 4200 m,

Nüsser 381 (B!). — ASTOR: Ru: Mazeno High Camp, ascent, 4550 m, *Nüsser 1492* (B!); 4650 m, *Nüsser 1507* (B!); 4770 m, *Nüsser 1512* (B!).
3700-4770 m / subalp.-subniv.: rock, scree / Tian Shan, Pamir, Karakorum, W Himalaya: Kashmir – Nepal / PAMIR / he.

Waldheimia tridactylites Kar. & Kir. (*Allardia tridactylites* (Kar. & Kir.) Sch. Bip., *Allardia glabra* Decne.)

CHILAS: Babusar P., 4050 m, *Miehe 450* (!); 4300 m, *Miehe 526* (!); Babusar P. NE, 4210 m, *Dickoré 12934* (!). – Ra: Raikot Gl., nunatak, 4180 m, *Nüsser 379* (B!). – Bu: Buldar Valley, Mamocha Peak <, 4200 m, *Troll 7865*. — ASTOR: As: Rama Valley, 3700 m, *Nüsser 163* (B!). – Ru: Latobo, Tap Gl., 4000 m, *Nüsser 62* (B!); Mazeno terminal moraine, 4400 m, *Peer 32* (!). — ASTOR/DEOSAI: Burzil P., 3960-4260 m, *R. R. & I. D. Stewart 19010* (RAW!); 4650 m, 1977-08-20, *Azim & Shaheed* (RAW!).

3700-4650 m / subalp.-subniv.: alluvial fan, dwarf scrub, turf, scree, rock / Pamir, Karakorum, Tibet, Himalaya / TIBET / ch.

The indumentum is highly variable, and apparently cannot serve to distinguish *W. tridactylites* and *W. glabra* even at subspecific level; the latter should be the more hairy plant.

Xanthium strumarium L. / Rough Cocklebur (e)

ASTOR: (Cat. Pak.).

coll.: ruderal / Europe, Asia / EURAS / th.

Convolvulaceae

Convolvulus arvensis L. / harioli (sh) / Field Bindweed (e)

CHILAS: Babusar Village, *M. Qaiser & A. Ali 5954* (KUH, Fl. Pak. 126). — ASTOR: Da: Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 226* (B!). – Ru: Churit E, 2450 m, *Nüsser 1608* (B!); Tarishing, 2910 m, *Nüsser 666* (B!). – Ka: Faqirkot, 2800 m, *Hansen 125* (!).
2450-2910 m / submont.-mont.: cultivated field (wheat), ruderal / Almost cosmopolitan, except Australia / COSMO / he.

Cuscuta campestris Yuncker / Yellow Dodder (e)

CHILAS: Go: Darang >, 1550 m, *Dickoré 12676* (!, on *Rumex hastatus*).

1550 m / coll.: semi-desert, parasite on various herbs (*Heliotropium dasycarpum*, *Stipagrostis plumosa*) / N America (introduced cosmopolitan) / COSMO / th.

May become a noxious weed and a danger to leguminous crops, apparently confined to rather low altitudes; also in Gilgit proper.

[*Cuscuta capitata* Roxb.]

ASTOR: Ka: Rattu, *R. R. Stewart 22794a* (NY, Fl. Pak. 189).

Probably belongs to *C. planiflora*.

Cuscuta planiflora Tenore (*C. approximata* Babington, *C. europaea* auct., non L.)

CHILAS: Babusar Village 2 miles – Gilgit, *M. Qaiser & A. Ghafoor 5403* (KUH, “*C. europaea*”, Fl. Pak. 189). — ASTOR: (“var. *urceolata*”, Cat. Pak.). – As: Gudai Valley,

Duthie (“*C. europaea*”, Cat. Pak.); 1892-07-23, *Duthie* (K, “*C. europaea*”, Fl. Pak. 189); Gurikot, 2400 m, *Troll 7545* (“*C. europaea*”); Rama – Gurikot, R. R. *Stewart & E. Nasir 9476* (RAW, “*C. europaea*”, Fl. Pak. 189). – Ru: Lower Rupal Valley, R. R. & I. D. *Stewart 18861* (NY, “*C. europaea*”, Fl. Pak. 189); Rattu – Rupal Valley, R. R. *Stewart & E. Nasir 22866a* (RAW, “*C. europaea*”, Fl. Pak. 189). – Ka: Faqirkot, 2980 m, *Schickhoff 1330* (!); Rattu (“*C. europaea* var. *indica*”, Cat. Pak.); 2800 m, *Troll 7968* (“*C. europaea*”); Rattu >, Astor Valley, R. R. & I. D. *Stewart 18778* (NY, “*C. europaea*”, Fl. Pak. 189). — ASTOR/DEOSAI: Burzil P., R. R. *Stewart 19217* (NY, “*C. europaea*”, Fl. Pak. 189). 2400-2980 m / submont.-mont.: forest, meadow, scrub; parasitic on a variety of herbs and dwarf scrubs (*Pinus wallichiana*) / *Medit.*, S Europe, SW Asia / *MEDIT* / th. Specimens cited under *C. europaea* are tentatively included here (*C. europaea* var. *indica* Engelm.?). The European species does not occur in the area.

***Cuscuta reflexa* Roxb.**

CHILAS: Babusar 3 miles – Gilgit, S. *Abedin & M. Qaiser 957* (KUH, Fl. Pak. 189). — ASTOR: Ka: Kalapani (Cat. Pak.).
Himalaya: Afgh. – SW China, SE Asia / *HIMAL* / th.

Crassulaceae

Crassula alata* (Viv.) Berger subsp. *alata

CHILAS: Go: Gor, 2400 m, *Dickoré 12536* (!).
2400 m / submont.: moist, steppe-forest (*Quercus*) / NE Africa, *Medit.*, SW Asia, NW Himalaya, Himalaya: Afgh. – Nepal (subsp. *pharnaceoides* (Fisch. & Mey.) Wickens & Bywater in C. Africa) / *MEDIT* / th.

***Hylotelephium ewersii* (Ledeb.) H. Ohba (*Sedum ewersii* Ledeb.)**

CHILAS: Babusar P., 4000-4200 m, *Miehe 575* (!). – Go: Gor, 3230 m, *Schickhoff 1553* (!). – Pa: Diamir Valley, 3150 m, *Schickhoff 2450* (!). – Ra: Raikot Gl. – Ganalo Gl. confluence, 3890 m, *Nüsser 295* (B!); Raikot Gl., nunatak, BC, 4000 m, *Troll 7775*. — ASTOR: As: Sango Sar, 3050-3660 m, *Giles 615* (K!). – Ru: Mazeno terminal moraine, 4400 m, *Peer 51* (!); Rupal Valley, Nagachakali, nunatak, 3890 m, *Nüsser 656* (B!).
3050-4400 m / mont.-alp.: forest, moraine, scree, turf (*Picea*, *Pinus wallichiana*) / Altai, Tian Shan, Pamir, Afgh., S Karakorum, W Himalaya / *PAMIR* / he.

***Pseudosedum lievenii* (Ledeb.) Berger (*Cotyledon lievenii* Ledeb., *Sedum lievenii* (Ledeb.) Hamet)**

CHILAS: Go: Gor Gali, 2800 m, *Troll 7117*. – Bu: Buldar Valley, Fary, 2790 m, *Nüsser 1032* (B!). — ASTOR: Da: Doian, 2440-2740 m, *Giles 205* (K!); Harchu Valley, Baro Nirril >, 3230 m, *Nüsser 877* (B!). – As: Gurikot – Rattu, *F. Schmid 1761* (Cat. Pak.).
2440-3230 m / mont.: rock, steppe / C. Asia, Pamir, SW Karakorum, NW Himalaya / *PAMIR* / ch.

***Rhodiola fastigiata* (Hook. f. & Thomson) Fu (*Sedum fastigiatum* Hook. f. & Thomson)**

CHILAS: Pa: Pattaro Valley, 3900 m, *Troll 7699*; Pattaro Valley, Guttum Sagar, 4490 m,

Nüsser 1371 (B!); Pattaro Valley, Guttum Sagar, moraine, 4490 m, *Nüsser 1391* (B!). – Ra: Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser 1323* (B!); Raikot Gl., nunatak, BC, 4300 m, *Nüsser 495* (B!); 4400 m, *Nüsser 500* (B!); 4430 m, *Nüsser 508* (B!); Raikot Valley, right slope, 3870 m, *Nüsser 986* (B!). — ASTOR: As: Sango Sar, 3050-3660 m, *Giles 629* (K!). – Ru: Latobo, Tap Gl., 3950 m, *Nüsser 54* (B!); Rupal Valley, Nagachakali, nunatak, 3810 m, *Nüsser 653* (B!); Tap Gl. right lateral moraine, 3590 m, *Nüsser 738* (B!); upper Mazeno BC, 4320 m, *Nüsser 1470* (B!); upper Rupal Valley, 3800-4000 m, *Troll 7434* (“*Sedum quadrifidum* var. *tibeticum*”).

3050-4490 m / mont.-alp.: dwarf scrub, moraine, scree, turf / Pamir, Karakorum, Himalaya: Afgh. – SE Tibet, SW China / TIBET / ch.

Rhodiola heterodonta (Hook. f. & Thomson) Fu (*Sedum heterodontum* Hook. f. & Thomson)

CHILAS: Ra: Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser 1324* (B!); Raikot Gl., nunatak, BC, 3910 m, *Nüsser 1293* (B!). — ASTOR: Ru: Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1550* (B!); Tap – Latobo, 3500-3600 m, *Troll 7413*. – Ka: Shankargarh, 2930 m, *Giles 181* (K!, Cat. Pak.). — ASTOR/KASHMIR: Kamri P. 3350-3960 m, *Giles 684* (K!); *713* (K!).

2930-4200 m / mont.-alp.: rock, scree / Karakorum, Himalaya: Chitral – S Tibet / HIMAL / ch.

Rhodiola pachyclados (Aitch. & Hemsley) H. Ohba (*Sedum pachyclados* Aitch. & Hemsley, *S. trollii* Werderm.)

CHILAS: Bu: Doian Ridge, Lichar Valley, 3200 m, *Troll 7583* (B, type of *S. trollii*, destroyed). 3200 m / mont.: forest, rock (*Picea*, *Pinus wallichiana*) / E Afgh. (Kurram), SW Karakorum, NW Himalaya: Chilas, Gilgit, Hunza / ENDEM / ch.

S. trollii Werderm. is tentatively included here, since according to the description it differs in a few- or one-flowered inflorescence only; specimens from SW Karakorum referable to the description of *S. trollii* have also been seen.

Rhodiola quadrifida Fisch. & Mey.

CHILAS: Babusar P. N, 3700 m, *Dickoré 12854* (!). — ASTOR/KASHMIR: Kamri P. top, 4270 m, *R. R. Stewart 22682* (K!)

3700-4270 m / subalp.-alp.: avalanche path, scree / N & C. Asia, Tibet, Himalaya / C AS / ch.

Rhodiola sinuata (Royle ex Edgew.) Fu (*Sedum linearifolium* Royle)

Astor/Skardu: Alampi P., 4270 m, 1892-07-21, *Duthie 12180* (K!, Cat. Pak.).

4270 m / alp.: on rocks amongst wet moss / Himalaya: Astor, Kashmir – SE Tibet / HIMAL / ch. NW outpost of area.

Rhodiola wallichiana (Hook.) Fu (*Sedum crassipes* Hook. f. & Thomson)

CHILAS: Babusar P., 4300 m, *Miehe 565* (!). – Pa: Pattaro Valley, Guttum Sagar – Kosto Gali, 4720 m, *Nüsser 1393* (B!). – Ra: Raikot Gl., nunatak, 4250 m, *Nüsser 389* (B!); 4270 m, *Nüsser 393* (B!); 4550 m, *Nüsser 399* (B!); Raikot Gl., nunatak, BC, 3990 m, *Nüsser 459* (B!); 4100 m, *Nüsser 478* (B!). — ASTOR: (Cat. Pak.). – As: Waylari, 1847-07-12, *Winterbottom 772* (K!). – Ru: Latobo S, 4320 m, *Nüsser 77* (B!); Mazeno Gl.,

4400 m, *Peer* (!); Toshain Valley, moraine, 4700 m, *Nüsser 1526* (B!).

3990-4720 m / alp.-subniv.: boulder slope, scree, turf / Karakorum, W Himalaya: Afgh. – Sikkim / W HIM / ch.

Rosularia adenotricha (Wall. ex Edgew.) Jansson

subsp. ***adenotricha***

CHILAS: Go: Thelichi – Gor Gali, 2200-2800 m, *Troll 7101*. — ASTOR: Ka: Kalapani (Cat. Pak.). 2200-2800 m / submont.-mont. / W Himalaya: E Afgh. – Nepal / W HIM / ch.

subsp. ***viguieri*** (Raymond-Hamet) Jansson (*Sedum talichiense* Werderm.)

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12624* (!); Thelichi – Gor Gali, 2200-2800 m, *Troll 7101a* (B, type of *Sedum talichiense* Werderm., destroyed). – Pa: Pattaro Valley, Zangal, 2600 m, *Troll 7691* (“*Sedum viguieri*”). 2200-2950 m / submont.-mont. / Pamir, Hindulush, W Himalaya / PAMIR / ch.

Rosularia alpestris (Kar. & Kir.) A. Boriss. (*Sedum sciaphiophyllum* Werderm.)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1746* (!). – Go: Thelichi – Gor Gali, 2000 m, *Troll 7100* (“*S. sciaphiophyllum*”). – Ra: Tato – Fairy Meadows, 2930 m, *Nüsser 976* (B!). — ASTOR: Da: Astor – Doian, *Conway 217* (K!); Doian >, 3050-3350 m, 1892-08-14, *Duthie* (K!); Mushkin, 1900 m, *Troll 7259* (B, type of *S. sciaphiophyllum* Werderm., destroyed); Ramghat, 1500 m, *Troll 7069* (“*S. sciaphiophyllum*”). – As: Los >, 2800 m, *Troll 7331*. Rama (Cat. Pak.); Ting – Waylari, 1847-07-12, *Winterbottom* (K!). – Ka: Kalapani, 3230 m, *Giles 669* (K!); Rattu, R. R. Stewart (Cat. Pak.). 1500-3350 m / coll.-mont.: forest, rock, steppe (*Cedrus*, *Juniperus excelsa*) / Altai, Tian Shan, Pamir, Hindukush, W Himalaya / C AS / ch.

Rosularia rosulata (Edgew.) H. Ohba

CHILAS: Go: Gor, 2690 m, *Schickhoff 1581* (!, cf.); Gor > NW, 2600 m, *Dickoré 12568* (!). 2600-2690 m / submont.: steppe-forest (*Pinus gerardiana*, *Quercus*) / W Himalaya: Chitral – Sikkim / W HIM / ch.

Cruciferae (*Brassicaceae*)

Alliaria petiolata (M. Bieb.) Cavara & Grande (*A. officinalis* Andr.) / Garlic Mustard (e)

ASTOR: As: Los, 2300 m, *Troll 7323*.

2300 m / submont. / N Africa, Europe, W Asia, Himalaya: Kashmir – Nepal / EURAS / he.

Alyssum desertorum Stapf (*A. minimum* sensu Willd., non L.) / Dwarf Alyssum (e)

ASTOR: (Cat. Pak.). – As: Gurikot, 2400 m, *Troll 7542*. – Ru: Rupal Valley, Nahake, 2950 m, *Nüsser 777* (B!).

2400-2950 m / submont.-mont. / N Africa, SE Europe, SW & C. Asia, SW Karakorum, W Himalaya / EURAS / th.

Aphragmus obscurus (Dunn) O. E. Schulz (*Draba obscura* Dunn, *Lignariella obscura* (Dunn) Jafri, *A. himalaicus* O. E. Schulz)

ASTOR/DEOSAI: Burzil P., *R. R. Stewart 18871* (Cat. Pak.); 3960-4260 m, *R. R. Stewart 19871* (RAW!).
3960-4260 m / alp. / Kashmir / ENDEM / he.

Aphragmus oxycarpus (Hook. f. & Thomson) Jafri (*Braya oxycarpa* Hook. f. & Thomson)
CHILAS: Pa: Pattaro Valley, 4500 m, *Troll 7740*; Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser 1378* (B!). — ASTOR/DEOSAI: Mir Panzil P., Burzil Chowki >, 4260 m, 1940-07-28, *R. R. Stewart* (RAW!).
4260-4500 m / alp.-subniv. / Pamir, Karakorum, Tibet, Himalaya / TIBET / he.

Arabidopsis himalaica (Edgew.) O. E. Schulz (*Arabis himalaica* Edgew., *Sisymbrium himalaicum* (Edgew.) Hook. f. & Thomson)
CHILAS: Babusar P. N, 3700 m, *Dickoré 12847* (!). — ASTOR: Ka: Kalapani, 3050 m, *Schickhoff 1273* (!); 3260 m, *Schickhoff 1233* (!); 3260 m, *Schickhoff 1212* (!).
3050-3700 m / mont.-subalp.: avalanche path, dwarf scrub, forest, scree (*Abies*, *Artemisia santolinifolia*) / Himalaya: Afgh. – Bhutan, SE Tibet / HIMAL / th.
Delimitation against *A. mollissima* not quite certain, *A. himalaica* appears to be generally a species of the Outer Himalaya.

Arabidopsis mollissima (C. A. Mey.) N. Busch (*Sisymbrium mollissimum* C. A. Mey.)
CHILAS: Babusar Valley, 2750 m, *Schickhoff 1745* (!). — Go: Gor, 2690 m, *Schickhoff 1593* (!); 3230 m, *Schickhoff 1529* (!); 3520 m, *Schickhoff 1466* (!). — Ra: Raikot Gl., nunatak, 3900 m, *Nüsser 423* (B!); Raikot Valley, 3220 m, *Schickhoff 1682* (!); Raikot Valley, Bayal, 3600 m, *Nüsser 1282* (B!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 321* (B!). — ASTOR: (Cat. Pak.). — Da: Mushkin Forest, 3000 m (*Schickhoff 1449*). — As: Das Kirim, 1847-07-01, *Winterbottom 756* (K!, Fl. Pak. 55); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1020* (!); Teing [Ting], 1847-07-11, *Winterbottom 756* (K!). — Ru: Latobo, Tap Gl., left lateral moraine, 3660 m, *Nüsser 37* (B!); Rupal Valley, Nahake – Gageh, 3000 m, *Nüsser 772* (B!); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1547* (B!); 3950 m, *Nüsser 1541* (B!).
2690-3950 m / submont.-alp.: forest, meadow, scrub, steppe-forest, turf (*Abies*, *Cedrus*, *Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / C. Asia, Karakorum, W Himalaya / C AS / th.

Arabidopsis thaliana (L.) Heynh. (*Arabis thaliana* L., *Sisymbrium thalianum* (L.) J. Gay & Monn.) / Thale Cress (e)
ASTOR: (Cat. Pak.). — Da: Mushkin RH > SE, 2750 m, *Dickoré 12778* (!). — As: Ting in Hasora, 1847-07-11, *Winterbottom 757* (K!, Fl. Pak. 55). — Ka: Steanmarg (Kazmi & Siddiqui 1953).
2750 m / mont.: forest (*Pinus wallichiana*) / Africa, Europe, Asia / EURAS / th.
Medicinal.

Arabis glabra (L.) Bernh. (*Turritis glabra* L., *A. perfoliata* Lam.) / Tower Mustard (e)
CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2785* (RAW!). — Ra: Tato – Fairy Meadows, 2670 m, *Nüsser 971* (B!). — ASTOR: (Cat. Pak.). — As: Suti Suce – Das

Kirim, 1847-07-01, *Winterbottom 311* (K!, Fl. Pak. 55). – Ka: Kalapani, 3050 m, *Schickhoff 1265* (!).

2670-3960 m / submont.-alp.: dwarf scrub (*Artemisia santolinifolia*) / Europe, Asia / EURAS / he.

Arabis pterosperma Edgew. (*A. alpina* Hook. f. & Thomson)

ASTOR: Ka: Kalapani, *Giles 124* (Cat. Pak.). — ASTOR/DEOSAI: Burzil >, 1847-06-28, *Winterbottom 59* (K!).

Himalaya: Kashmir – Bhutan / HIMAL / he.

Arabis saxicola Edgew. (*A. scaposa* O. E. Schulz)

ASTOR: Ka: Kalapani, 3040-3350 m, 1892-08-25, *Duthie* (K!).

3040-3350 m / mont.: rock / SW Karakorum, W Himalaya / ENDEM / he.

[*Arabis taraxacifolia* T. Anders.]

ASTOR: Ru: Tarishing, 3000 m, *Troll 7499*.

3000 m / mont. / E Afgh., W Himalaya / W HIM / he.

Possibly a misidentification of *A. tibetica*.

Arabis tenuirostris O. E. Schulz (*A. clarkei* O. E. Schulz, ? *Microsymbrium angustifolium* Jafri)

ASTOR: (Cat. Pak.). – As: Rama, 3040 m, *E. Nasir & Webster 6463* (RAW!, “*Microsymbrium angustifolium*”). – Ka: Kamri P. N, 3040 m, *R. R. Stewart 22772a* (K!, Cat. Pak., Fl. Pak. 55).

3040 m / mont.: forest (*Cedrus*) / W Himalaya: Astor, Baltistan, Kashmir / ENDEM / he. Close to *A. tibetica* and possibly not distinct.

Arabis tibetica Hook. f. & Thomson (*Arabis thomsonii* Hook. f. & Thomson, *Arabidopsis multicaulis* Pamp., *Arabis quinqueloba* O. E. Schulz)

ASTOR: As: Suti Suce – Das Kurrum, 1847-07-01, *Winterbottom 531* (K!). – Ru: Upper Rupal Valley, 3600 m, *Troll 7415*. — ASTOR/KASHMIR: Kamri P., Naigund, 1901-07-11, *Inayat 25512* (K!); P. to Gurais from Kashmir, 1847-06-22, *Winterbottom 531* (K!, Fl. Pak. 55). — ASTOR/DEOSAI: Burzil, 3200 m, 1876-07-26, *C. B. Clarke 29624* (K!); Burzil >, 1847-06-28, *Winterbottom 59* (K!, Fl. Pak. 55); Burzil P. top, 4260 m, *R. R. Stewart 22064* (K!).

3200-4260 m / mont.-alp. / C. Asia, Karakorum, W Himalaya / C AS / he.

Barbarea intermedia Boreau (*B. plantaginea* DC., *B. vulgaris* var. *sicula* (Presl) Hook. f. & Thomson) / Medium-flowered Winter-ress (e)

ASTOR/KASHMIR: Kamri P., 3350-3650 m, *R. R. & I. D. Stewart 18691* (RAW!); Kamri P., Gilgit Rd., *R. R. Stewart 18716* (RAW!, “*B. plantaginea*”); Rasparin P., *Winterbottom 226* (K, Fl. Pak. 55). — ASTOR/DEOSAI: Burzil Chowki, 3350 m, *R. R. & I. D. Stewart 19116* (RAW!).

3350-3650 m / mont.-subalp. / N Africa, Europe, Asia / EURAS / th.

Barbarea vulgaris R. Br. / sanzarri (sh), Winter-cess (e)

ASTOR: (Cat. Pak.). – As: Bulashbar Bridge, 2420 m, *Nüsser 811* (B!); Gurikot Valley, 3400 m, *Troll 7524*. – Ka: Kalapani, 3050 m, *Schickhoff 1272* (!); 3260 m, *Schickhoff 1220* (!); 3500 m, *Hansen 94* (!); Shankargarh, *R. R. & I. D. Stewart 21760* (RAW!). — ASTOR/KASHMIR: Kamri P., *R. R. & I. D. Stewart 18716* (RAW!); *R. R. & I. D. Stewart 18693* (RAW!).
2420-3500 m / submont.-subalp.: dwarf scrub, forest (*Abies*, *Artemisia santolinifolia*, *Cedrus*) / Europe, Asia / EURAS / he.

● ***Brassica napus*** L. / Rape (e)

CHILAS: Ra: Tato, 2400 m, *Troll 7805*.
2400 m / submont. / cultivated / th.

Buchingera axillaris Boiss. & Hohen.

ASTOR: Da: Doian – Mushkin, 2000-2500 m, *Troll 7245* (“var. *major*”).
2000-2500 m / submont.: scree, steppe-forest (*Fraxinus*) / C. & SW Asia, Iran – NW Pakistan / IRAN / th.
Rare, on the SE edge of its distribution; also in Gilgit (Kar Gah and Naltar Valley).

Camelina sativa (L.) Crantz / Gold-of-pleasure (e)

ASTOR: Ru: Tarshing <, *R. R. Stewart & E. Nasir 22845* (RAW!).
Europe, SW & C. Asia / EURAS / th.

Capsella bursa-pastoris (L.) Medicus / Shepherd’s-purse (e)

ASTOR: As: Astor Bazar, Hotel, 2440 m, *Nüsser 902* (B!).
2440 m / submont.: forest, hay-meadow, ruderal / Cosmopolitan / COSMO / th.

Cardamine impatiens L. / Narrow-leaved Bitter-cess (e)

ASTOR: Astor Valley (Kazmi & Siddiqui 1953). – Ka: Kalapani, 3260 m, *Schickhoff 1205* (!).
3260 m / mont.: forest (*Abies*) / Europe, Asia / EURAS / th.
Medicinal.

Cardamine loxostemonoides O. E. Schulz (*C. pratensis* sensu Hook. f. & Anders., non L.) / punar (sh)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1735* (!). – Ra: Bezar Gali, 3800-4000 m, *Troll 7660*; Kosto Valley, 4300 m, *Nüsser 1410* (B!); Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser 1330* (B!); Raikot Valley, 3300 m, *Troll 7618*; Raikot Valley, Bayal, 3580 m, *Nüsser 931* (B!). — ASTOR: *F. Schmid* (RAW, Fl. Pak. 55). – Da: Mushkin RH > SE, 2750 m, *Dickoré 12785* (!). – As: Rama > lake nr., 3350 m, *E. Nasir & Webster 6450* (RAW!, Fl. Pak. 55); Rama Valley, 3550 m, *Nüsser 158* (B!); Rattu – Gurikot, *F. Schmid* (Cat. Pak.); Sango Sar, 3040-3650 m, *Giles 547* (K!, Fl. Pak. 55); Waylari in Hasora, 1847-07-12, *Winterbottom 773* (K!, Fl. Pak. 55). – Ru: Latobo S, 4320 m, *Nüsser 79* (B!); 4320 m, *Nüsser 78* (B!).
2750-4320 m / mont.-alp.: alluvial fan, among boulders, forest, scree (*Abies*, *Cedrus*, *Pinus wallichiana*) / Himalaya: Kashmir – Bhutan, SE Tibet / HIMAL / ge.
NW edge of distribution.

[*Chorispora macropoda* Trautv.]

ASTOR: *Tanner 101a* (Cat. Pak.).

C. Asia, Afgh., NW Pakistan (Chitral) / he.

Doubtful, record may refer to *Ch. sibirica*. *Ch. macropoda* is common in Chitral, but apparently not known with certainty eastwards.

Chorispora sabulosa Camb. (*Ch. elegans* Camb.)

CHILAS: Babusar P., 4300 m, *Miehe 525* (!); Babusar P. N, 3700 m, *Dickoré 12848* (!). – Go: Gor Gali, 2800 m, *Troll 7102* (“*C. elegans*”); Gor, Kahlimay >, 4050 m, *Nüsser 1096* (B!); 4050 m, *Nüsser 1095* (B!). – Pa: Pattaro Valley, 4400-4500 m, *Troll 7725*; Pattaro Valley, Guttum Sagar – Kosto Gali, 4750 m, *Nüsser 1399* (B!). – Ra: Raikot Gl., nunatak, 4550 m, *Nüsser 398* (B!); Raikot Valley, Bayal, 3580 m, *Nüsser 929* (B!). — ASTOR: Da: Doian, 3000-3500 m, *Troll 7221*; Harchu Valley, 3500 m, *Nüsser 844* (B!); 3540 m, *Nüsser 836* (B!); Harchu Valley, Baro Nirril, 3100-3200 m, *Troll 7282*. – As: Rama, *E. Nasir & Webster 6448* (RAW!); Rama Valley, Sachen Gl., left ablation valley, 3530 m, *Nüsser 199* (B!). – Ru: Chichi Valley, 3200 m, *Troll 7486*; Mazeno High Camp, ascent, 4600 m, *Nüsser 1500* (B!); Rupal Valley, Tap, 3490 m, *Nüsser 725* (B!); Toshain Valley, moraine, 4700 m, *Nüsser 1524* (B!). – Ka: Gurys P. N, 1847-06-22, *Winterbottom 532* (K!); Kamri Valley, *Duthie* (BM, E, Fl. Pak. 55). — ASTOR/KASHMIR: Kamri P., 3350-3960 m, *Giles 706* (K!, Fl. Pak. 55); 3960 m, *R. R. & I. D. Stewart 18672* (RAW!). — ASTOR/DEOSAI: Burzil, 3650 m, *Koelz 9444* (RAW!); Burzil P., 4260 m, *R. R. Stewart 22065* (K!, RAW!). — ASTOR/SKARDU: Alampi P., 4260 m, 1892-07-21, *Duthie 12171* (K!, Fl. Pak. 55). 2800-4750 m / mont.-subniv.: alluvial plain, avalanche path, damp gravel slide, meadow, scree, turf / Pamir, Tian Shan, Karakorum, W Himalaya / PAMIR / he.

Chorispora sibirica (L.) DC.

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir* (RAW!). – Go: Gor, Kahlimay, 3610 m, *Nüsser 1115* (B!); Gor, Martal, 2930 m, *Nüsser 1080* (B!). – Ra: Raikot Valley, Fary, 2700 m, *Nüsser 1018* (B!); Raikot Valley, Pungadori, 3300 m, *Nüsser 355* (B!); Raikot Valley, village Fary, 2680 m, *Nüsser 1013* (B!); Tato – Fairy Meadows, 2760 m, *Nüsser 972* (B!). — ASTOR: 1901-07-07, *Inayat 25507* (K!, Fl. Pak. 55); *Conway* (Cat. Pak.); *Duthie* (E, Fl. Pak. 55). – Da: Astor – Doian, *Conway 307* (K!, Fl. Pak. 55). – As: Gudai – Chillam, 2430-3650 m, *R. R. Stewart 18966* (Cat. Pak.); 2740 m, *R. R. & I. D. Stewart 18967* (RAW!); Gurikot, 2380 m, *Nüsser 816* (B!); Naugam in Hasora, 1847-07-03, *Winterbottom 704* (K!, Fl. Pak. 55). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19036* (Cat. Pak.); 3650 m, *R. R. & I. D. Stewart 19036* (RAW!). 2380-3960 m / submont.-alp.: house roof, ruderal, steppe, steppe-forest (*Juniperus excelsa*) / C. Asia, SW Karakorum, W Himalaya / C AS / th.

Christolea himalayensis (Camb.) Jafri

ASTOR: Ru: Mazeno High Camp, ascent, 4770 m, *Nüsser 1511* (B!); Toshain Valley, Mazeno High Camp, 4900 m, *Nüsser 1521* (B!). 4770-4900 m / subniv.: moraine, scree / Karakorum, Himalaya: Kashmir – Sikkim / W HIM / he.

[*Cochlearia conwayi* Hemsley]

ASTOR: Da: Doyan – Ramghat, *Conway 305* (K, type, Fl. Pak. 55).

Probably no *Cochlearia*; type presently not traceable.

Conringia planisiliqua Fisch. & C. A. Mey.

ASTOR: Da: Doian, 2430-2740 m, 1885-07-22, *Giles 203* (K!, Cat. Pak., Fl. Pak. 55);

Turbaling – Doian, 2700 m, *Troll 7900*.

2430-2740 m / submont.-mont.: cultivated field, ruderal / SW Asia: Turkey – Afgh., SW Karakorum, W Himalaya / IRAN / th.

Descurainia sophia (L.) Webb & Berth. / Flixweed (e)

CHILAS: Go: Gor, Martal <, 2650 m, *Nüsser 1177* (B!). – Ra: Raikot Valley, Fary, 2700 m,

Nüsser 1022 (B!); Raikot Valley, Pungadori, 3300 m, *Nüsser 356* (B!). — ASTOR: Da:

Turbaling – Doian, 2700 m, *Troll 7899*. – As: Astor Bazar, Hotel, 2440 m, *Dickoré 12810*

(!); Gurikot, 2500 m, *Troll 7339*; Rattu – Gurikot, 2430 m, 1954-05-25, *F. Schmid* (RAW!).

– Ru: Rupal Valley, 2430 m, *E. Nasir & Webster 6496* (RAW!, Fl. Pak. 55); Rupal Valley, Nahake, 2950 m, *Nüsser 776* (B!).

2430-3300 m / submont.-mont.: meadow, ruderal, scrub / Africa, Europe, Asia / EURAS / th.

Draba altaica (C. A. Mey.) Bunge (*D. fladnitzensis* var. *homotricha* Hook. f. & Anders., *D. rupestris* var. *altaica* C. A. Mey.)

CHILAS: Babusar P., 4300 m, *Miehe 486a* (!); *Miehe 513* (!); *Miehe 521* (!); *Miehe 566* (!);

4320 m, *Miehe 544* (!); Babusar P. NE, 4210 m, *Dickoré 12891* (!). – Pa: Pattaro Valley,

3900 m, *Troll 7713*; 4600 m, *Troll 7739*. — ASTOR: Ru: Mazeno High Camp, ascent,

4500 m, *Nüsser 1486* (B!); Toshain Valley, ascent to Mazeno Gali, 5300 m, *Nüsser 1515*

(B!); upper Rupal Valley, 3500-3600 m, *Troll 7451*.

3500-5300 m / subalp.-subniv.: dwarf scrub, rock, scree, turf / C. Asia, Tibet, Himalaya / TIBET / th.

Draba cachemirica Gandoger

ASTOR/DEOSAI: Stakpi P., 3350 m, 1847-06-28, *Winterbottom 617* (K!).

3350 m / mont. / NW Inner Himalaya: Deosai, Dras, Zanskar, Lahul / ENDEM / ch.

A doubtful species with close affinities to *D. setosa* and *D. trinervis*.

Draba lanceolata Royle (*D. incana* Hook. f. & Thomson, non L.)

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12889* (!); 4210 m, *Dickoré 12892* (!); Babusar

Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2805* (RAW!). – Go: Gor, 3520 m, *Schickhoff*

1490 (!). – Pa: Pattaro Valley, 3900 m, *Troll 7710*. — ASTOR: Ru: Upper Mazeno BC,

4320 m, *Nüsser 1484* (B!). — ASTOR/KASHMIR: Kamri P., 3960 m, *R. R. Stewart 18657*

(RAW!). — ASTOR/DEOSAI: Burzil P., 3960-4260 m, *R. R. Stewart 19896* (RAW!); Stakpi

P. [border of Deosai Plains nr. Burzil P.], 3200 m, *Winterbottom* (K!). — Astor/Skardu:

Harpurkund P. to Rondu, 3040 m, 1847-07-13, *Winterbottom* (K!).

3040-4320 m / mont.-alp.: dwarf scrub, rock, scree, scrub, turf / Tian Shan, Pamir, SW Karakorum, W Himalaya / PAMIR / he.

Draba oreades Schrenk & C. A. Mey. (*D. algida* Kar. & Kir., *D. alpina* sensu Hook. f., non L., *D. glacialis* sensu Duthie, non Adams)

CHILAS: Pa: Pattaro Valley, 4300–4700 m, *Troll 7738*; Pattaro Valley, Guttum Sagar, moraine, 4490 m, *Nüsser 1392* (B!). – Ra: Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser 1329* (B!). — Astor/Skardu: Alampi P., 4260 m, 1892-07-21, *Duthie 12172* (K!, Fl. Pak. 55). 4200–4700 m / alp.-subniv. / C. Asia, Tibet, Himalaya / TIBET / he.

Possibly intergrading and partly mixed up with *D. setosa*.

Draba setosa Royle (*D. glacialis* Hook. & Anders.)

CHILAS: Babusar P., 3960–4260 m, *Metz 198* (RAW!); 4300 m, *Miehe 520* (!); *Miehe 530* (!); Babusar P. N, 3700 m, *Dickoré 12849* (!); Babusar P. NE, 4210 m, *Dickoré 12890* (!). — ASTOR: Ru: Mazeno High Camp, ascent, 4600 m, *Nüsser 1493* (B!). — ASTOR/KASHMIR: Kamri P., 3960–4260 m, *R. R. Stewart 18674* (RAW!). — ASTOR/DEOSAI: Burzil P. top, 4260 m, *R. R. & I. D. Stewart 19099* (RAW!); Stakpi P. nr. Burzil on Skardu Rd., 3130 m, 1847-06-29, *Winterbottom* (K!).

3130–4600 m / mont.-subniv.: avalanche path, dwarf scrub, rock, scree, turf / SW Karakorum, W Himalaya: Swat – Kunawar / W HIM / ch.

Draba stenocarpa Hook. f. & Thomson (*D. linearis* Hook. & Anders., non Boiss.)

CHILAS: Ra: Raikot Valley, Batharet, 3400 m, *Nüsser 1002* (B!); Raikot Valley, Pungadori, 3300 m, *Nüsser 918* (B!); Raikot Valley, right slope, 3660 m, *Nüsser 994* (B!); Tato – Fairy Meadows, 3060 m, *Nüsser 982* (B!). — ASTOR: Da: Astor – Doian, *Conway 304* (K!); Doian, 2800–3500 m, *Troll 7223*; Harchu Valley, Baro Nirril >, 3230 m, *Nüsser 884* (B!). – As: Das Kirim, *Winterbottom 679* (K, type, Cat. Pak., Fl. Pak. 55). – Ru: Chichi Valley, 3000 m, *Troll 7474*; Latobo, 3600 m, *Troll 7416*; Zaipur >, 3120 m, *Schickhoff 1056* (!). 2800–3660 m / mont.-subalp.: forest (*Abies*, *Picea*) / C. Asia, Karakorum, W Himalaya / C AS / th.

Draba tibetica Hook. f. & Thomson (*D. thomsonii* Pohle, *D. tibetica* var. *thomsonii* Hook. f. & Thomson)

ASTOR: Ru: Rupal Ridge, 3300 m, *Troll 7475*; Tap – Latobo, 3500–3600 m, *Troll 7417*. 3300–3600 m / mont.-subalp. / Pamir, SW Karakorum, W Himalaya / PAMIR / ch.

Draba winterbottomii (Hook. f. & Thomson) Pohle (*D. incompta* Hook. & Anders., *D. tibetica* “var. *winterbottomii*” Hook. f. & Thomson)

CHILAS: Pa: Pattaro Valley, Guttum Sagar – Kosto Gali, 4790 m, *Nüsser 1400* (B!). — ASTOR/SKARDU: Alampi P., 4260 m, *Duthie 12169* (E, K!, Fl. Pak. 55); P. from Astor to Rondo, *Winterbottom 623 bis* (Cat. Pak.).

3960–4790 m / alp.-subniv. / Karakorum, W Himalaya, S Tibet / TIBET / ch.

Erysimum altaicum C. A. Mey.

ASTOR: Ka: Upper Astor Valley, 3350 m, *R. R. & I. D. Stewart 18744* (RAW!). — ASTOR/KASHMIR: Kamri P., 3350–3960 m, *Giles 715* (K!, Cat. Pak., Fl. Pak. 55).

3350–3960 m / mont.-alp. / Altai, Tian Shan, Pamir, SW Karakorum, W Himalaya / C AS / th.

Not quite certain and perhaps referable to *E. melicentae*. Typical *E. altaicum* occurs in the SW Karakorum.

Erysimum cachemiricum O. E. Schulz (*E. pachycarpum* subsp. *cachemiricum* (O. E. Schulz) Jafri)

ASTOR: Ka: Kamri P. – Kalapani, *R. R. Stewart 22740* (RAW, Fl. Pak. 55). — ASTOR/DEOSAI: Burzil Chowki, *R. R. Stewart 22122* (Cat. Pak.); *R. R. Stewart 19132* (Cat. Pak.).

Astor, Kashmir / ENDEM / th.

[*Erysimum hieraciifolium* L. (*E. robustum* D. Don., *E. strictum* Gaertn.)]

ASTOR: Ka: Kalapani Valley, 3400 m, *Troll 8044*.

3400 m / subalp. / Europe, Asia / EURAS / th.

[*Erysimum longisiliquum* Hook. f. & Thomson]

ASTOR: Ru: Tap – Shaigiri, 3500-3650 m, *Troll 7421* (sp. aff.).

3500-3650 m / subalp. / th.

Doubtful record, species apparently confined to the C. Himalaya.

Erysimum melicentae Dunn (*E. odoratum* Hook. f. & Thomson, *E. parkeri* O. E. Schulz)

ASTOR: Ru: Tarishing P., 3650 m, 1847-07-09, *Winterbottom 530* (K!, Cat. Pak.). – Ka: Faqirkot, 3100 m, *Schickhoff 1378* (!); Shankargarh, 3040-3350 m, *R. R. Stewart 18741* (RAW!). — ASTOR/KASHMIR: P. to Gurais, 1847-06-22, *Winterbottom 530* (K!, Fl. Pak. 55). — ASTOR/DEOSAI: Burzil Chowki <, 3200 m, *R. R. Stewart 19844* (RAW).

3040-3650 m / mont.-subalp.: avalanche path, meadow / W Himalaya: Swat – Kashmir, NW India / W HIM / th.

Euclidium tenuissimum (Pallas) B. Fedtsch.

ASTOR: Da: Doian, 2500 m, *Troll 7247*.

2500 m / submont. / C. & SW Asia, NW Himalaya / IRAN / th.

Possibly identical with *E. syriacum*.

Eutrema septigera Bunge (*Thlaspi septigerum* (Bunge) Jafri)

ASTOR/DEOSAI: Burzil P., *Duthie 14030* (Cat. Pak.).

alp. / Tian Shan, Pamir, SW Karakorum, W Himalaya / PAMIR / he.

Undoubtedly a species of *Eutrema*. The delimitation of the C. Asiatic species, however, does not seem to be quite understood. Rare in the Karakorum and Inner W Himalaya.

Isatis costata C. A. Mey.

ASTOR/DEOSAI: Burzil P., *Inayat 25485* (Cat. Pak.).

Altai, Tian Shan, Pamir, W Himalaya / C AS / th.

Repeatedly collected in the Upper Kishenganga Valley.

Malcolmia africana (L.) R. Br. (*Hesperis africana* L.) / Malcolm Stock (e)

ASTOR: As: Astor Bazar, Hotel, 2440 m, *Nüsser 905* (B!).

2440 m / submont.: ruderal / N Africa, S Europe, SW & C. Asia / EURAS / th.

Matthiola flavida Boiss. (*M. odoratissima* Hook. f. & Anders., non Br., *M. tenera* Rech. f.)
 CHILAS: Go: Gor Gali, 2300 m, *Troll 7112* (“*Matthiola*”). – Bu: Muthat – Raikot Bridge, 2280 m, *Nüsser 1057* (B!). — ASTOR: Da: Astor – Bunji, *F. Schmid 1793* (Cat. Pak.); Bunji, 1400 m, *Troll 7189*; Ramghat, 1200-1800 m, *Troll 7060* (“*M. odoratissima*”). – As: Los in Hasora, 1847-07-04, *Winterbottom 712* (K!, Fl. Pak. 55). – Ka: Shankargarh, *Inayat 25486* (K!, Fl. Pak. 55).
 1200-2300 m / coll.-submont. / SW Asia: Iran, Afgh. – S Karakorum, W Himalaya / IRAN / he.

Megacarpaea bifida Benth.

ASTOR/KASHMIR: Kamri Kotal, 3650 m, *Giles 159* (K!, type).
 3650 m / subalp. / Astor, Kashmir / ENDEM / ge.
 Apparently endemic to a small area around the upper Kishenganga and Astor valleys, sympatric with *M. polyandra*.

Megacarpaea polyandra Benth. / chach, sag (sh)

ASTOR: As: Sakamel Valley, 3000 m, *Hansen 157a* (!). – Ka: Faqirkot, 2800 m, *Hansen 195* (!). — ASTOR/KASHMIR: Kamri P. (Cat. Pak.); 3040-3960 m, 1892-08-26, *Duthie* (K!, Fl. Pak. 55); 3350-3960 m, *Giles 690* (K!, Fl. Pak. 55). — ASTOR/DEOSAI: Burzil > [? Stakpi P.], 3200 m, *Winterbottom 626* (K!); Burzil Chowki >, 3350 m, *R. R. Stewart 19889* (RAW!).
 2800-3960 m / mont.-alp. / W Himalaya: Kashmir – Nepal / W HIM / ge.
 Collected as a vegetable.

Microsisymbrium minutiflorum (Hook. f. & Thomson) O. E. Schulz

ASTOR: As: Rattu – Gurikot, *F. Schmid* (Cat. Pak.).
 Iran, Afgh. – W Himalaya (Zanskar) / IRAN / th.

Nasturtium officinale R. Br. (*Rorippa nasturtium-aquaticum* (L.) Hayek, *Sisymbrium nasturtium-aquaticum* L.) / Water-cress (e)

CHILAS: Babusar Valley, Jal – Nagat, 2050 m, *Dickoré 12826* (!). – Go: Gor, Ranote, 2120 m, *Nüsser 1195* (B!).
 2050-2120 m / submont.: flush, meadow / N Africa, Europe, Asia / EURAS / he.

Rorippa islandica (Oeder) Borbás (*Nasturtium palustre* (Leysser) DC., non Crantz, *Sisymbrium islandicum* Oeder) / laljahu (u), Northern Yellow-cress (e)

ASTOR: As: Astor, 2310 m (Kazmi & Siddiqui 1953). – Ka: Rattu >, *R. R. Stewart* (Cat. Pak.).
 2310 m / submont. / Europe, Asia, N America / CIRCPO / th.

Sisymbrium altissimum L. (*S. pannonicum* Jacq., *S. sinapistrum* Crantz) / Tall Rocket (e)

ASTOR: As: Los in Hasora, 1847-07-05, *Winterbottom 713* (K!, Cat. Pak.). – Ru: Rupal Valley, *R. R. Stewart 22840* (RAW!, Cat. Pak., Fl. Pak. 55).
 Europe, SW & C. Asia / EURAS / th.

Sisymbrium brassiciforme C. A. Mey. (*S. columnae* Hook. f. & Anders.)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1743* (!).
 2750 m / mont.: forest (*Cedrus*) / C. Asia, Karakorum, S & E Tibet / C AS / th.

Tauscheria lasiocarpa Fisch. ex DC.ASTOR: Da: Doian, 2400-2700 m, *Troll 7217*.

2400-2700 m / submont.-mont. / SW & C. Asia, S Karakorum, Astor, Zanskar / C AS / th.

Thlaspi arvense L. / Field Penny-cress (e)CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2842* (RAW!).

3960 m / alp. / Europe, Asia / EURAS / th.

Thlaspi cochleariforme DC. (*T. alpestre* auct., non Jacq.)

CHILAS: Babusar P., 4050-4100 m, *Miehe 464* (!); 4300 m, *Miehe 496* (!); *Miehe 537* (!); Babusar P. N, 3700 m, *Dickoré 12858* (!); Babusar P. NE, 4210 m, *Dickoré 12902* (!). – Go: Gor, Kahlimay, 3610 m, *Nüsser 1088* (B!). – Pa: Pattaro Valley, 4500 m, *Troll 7741*. – Ra: Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser 1327* (B!); Raikot Valley, Bayal, 3580 m, *Nüsser 930* (B!). — ASTOR: Da: Rama Ridge N, 3100-3900 m, *Troll 7296* (“*T. alpestre*”). – As: Sango Sar, 3040-3650 m, 1886-08-14, *Giles 586* (K!, Fl. Pak. 55). – Ru: Mazeno High Camp, ascent, 4500 m, *Nüsser 1488* (B!); Tap – Bazhin Gl., 3500 m, *Troll 7453* (“*T. alpestre*”). — ASTOR/KASHMIR: Kamri P., *R. R. Stewart 18705* (RAW, Fl. Pak. 55); Kamri P. top, 4110 m, *R. R. Stewart 22715* (K!). — ASTOR/DEOSAI: Burzil P. (Cat. Pak.); Stakpi P. nr. Burzil on Iskardoo road, 3200 m, 1847-06-29, *Winterbottom* (K!, Fl. Pak. 55). 3040-4500 m / mont.-subniv.: avalanche path, dwarf scrub, rock, scree, turf / C. & N Asia, SW Karakorum, W Himalaya / C AS / he.

Several specimens have been named as *T. cochlearioides* Hook. f. & Thomson, which, if distinct, seems to be confined to the C. Himalaya.

Thlaspi griffithianum (Boiss.) Boiss. (*Carpoceras griffithianum* Boiss., *T. alpestre* auct., *T. cochleariforme* subsp. *griffithianum* (Boiss.) Jafri, *T. wendelboi* Rech. f.)

ASTOR: (Cat. Pak.). – As: Waylari, 3350 m, 1847-07-12, *Winterbottom* (K!). — ASTOR/KASHMIR: Kamri Kotal, 3650 m, *Giles 100* (K!, Fl. Pak. 55 (“*T. cochleariforme*”)); Rasparin P. [Pazparen P. from Naboo], 2740 m, 1847-07-18, *Winterbottom 53* (K!, Fl. Pak. 55 “*T. cochleariforme*”).

2740-3650 m / mont.-subalp. / W Himalaya: E Afgh – NW India / W HIM / he.

More robust and with longer style than *T. cochleariforme*. *T. griffithianum* appears to represent a montane-subalpine vicariant of (potential) forest habitats.

Cucurbitaceae● ***Cucumis sativa***L. / Cucumber (e)CHILAS: Babusar Village, 2800 m (*Dickoré*).

2800 m / th.

Cultivated in garden.

Datisceae***Datisca cannabina*** L. (*D. nepalensis* D. Don)

CHILAS: Go: Darang >, 1450 m, *Dickoré 12687* (!); Gor, 2160 m (*Dickoré*). — ASTOR: Da: Dashkin, 2300 m (*Dickoré*); Doian, 2000 m (*Dickoré*); Doian <, 1680 m, *Nüsser 721* (B!). –

As: Gurikot, *R. R. Stewart* (Cat. Pak.). – Ru: Rupal Valley, *R. R. Stewart* (Cat. Pak.); Tarishing, 3010 m (Kazmi & Siddiqui 1953).

1450-3010 m / coll.-submont.: scrub, watercourse / Crete, SW Asia: Turkey – Afgh., W Himalaya: Chitral – Nepal / IRAN / he.

Medicinal, and source of a yellow dye.

Dipsacaceae

Dipsacus inermis Wall. / dundeli (sh), uppahak (u)

ASTOR: Ka: Faqirkot, 2800 m, *Hansen 150* (!, cf.); Kalapani, 3050 m, *Schickhoff 1267* (!); Kalapani Valley, 3200 m, *Troll 8002*.

2800-3200 m / mont.: dwarf scrub (*Artemisia santolinifolia*) / Himalaya: Afgh. – Burma, SE Tibet, SW China / HIMAL / he.

Scabiosa speciosa Royle

ASTOR: *E. Nasir & Webster 6517* (Cat. Pak.). – Ru: Tarishing, 2930 m, *Nüsser 663* (B!). – Ka: Faqirkot, 2800 m, *Hansen 36* (!); Rattu, *R. R. Stewart* (Cat. Pak.); 2800 m, *Troll 7948*; Steanmarg, 3300 m, *M. B. Zaman 1845* (PPFI, Fl. Pak. 189).

2800-3300 m / mont.: cemetery by old fort, meadow, scrub, ruderal / W Himalaya: E Afgh. – Garhwal / W HIM / he.

Elaeagnaceae

Elaeagnus angustifolia L. / Russian Olive (e)

CHILAS: Go: Bunji – Thelichi, 1300 m, *Troll 7091* (“*E. hortensis* subsp. *moorcroftii*”); Darang >, 1450 m, *Dickoré 12696* (!). — ASTOR: (“*E. orientalis*”, Cat. Pak.). – Da: Astor – Bunji, 1300-2300 m, *F. Schmid 1794* (RAW, “var. *angustifolia*”, Fl. Pak. 85); Mushkin – Dashkin, 1900 m, *Troll 7271* (“*E. hortensis* subsp. *moorcroftii*”).

1300-2300 m / coll.-submont.: forest grove, irrigation, scrub, semi-desert / SE Europe, SW & C. Asia, W Himalaya / IRAN / ph.

Fruit edible, medicinal.

Elaeagnus umbellata Thunb.

CHILAS: Go: Darang >, 1450 m, *Dickoré 12695* (!).

1450 m / coll.: irrigation, semi-desert / Himalaya, China, Japan / HIMAL / np.

Hippophae rhamnoides subsp. *turkestanica* Rousi / bourou, buru (sh), sirma, tsarap (u) / Sea-buckthorn (e)

ASTOR: Da: Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 248* (B!). – As: Gurikot, 2500 m, *Troll 7048*; Naugaum environs, 1856-09-15/30, *Schlagintweit* (E, Rousi 1971); Rama Forest (Kazmi & Siddiqui 1953). – Ru: Churit – Bulashbar, 2480 m, *Nüsser 809* (B!); Hasora, Tashing (NW of Astor), 1856-09-15/22, *Schlagintweit* (A, Rousi 1971); Tarishing, 2930 m, *Nüsser 1604* (B!). – Ka: Shankargarh (Kazmi & Siddiqui 1953).

2480-2930 m / submont.-mont.: gravel-fan, forest, riverside (*Pinus wallichiana*, *Salix*

wallichiana) / C. Asia, Mongolia, W China, Pamir, Karakorum, Himalaya, S Tibet (for *H. rhamnoides* subsp. *rhamnoides*, Europe, Asia) / C AS / np.

Ericaceae

Cassiope fastigiata (Wall.) D. Don. (*Andromeda fastigiata* Wall.)

CHILAS: Ra: Raikot Valley, Nunatak, 3800 m, *Troll 7760*. — ASTOR/DEOSAI: Burzil P. >, 1847-06-28, *Winterbottom 633* (K!, Cat. Pak.).

3800 m / subalp.: fen, dwarf scrub / Himalaya: Nanga Parbat, Kashmir – Bhutan, SE Tibet / HIMAL / ch.

Apparently very rare, the Raikot locality represents the NW-most outpost of this species.

Rhododendron anthopogon D. Don / suhsuhr (sh)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2773* (RAW, Fl. Pak. 5). – Go: Gor, Kahlmity >, 3920 m, *Nüsser 1099* (B!). – Ra: Bezar Gali – Fairy Meadows, 3740 m, *Nüsser 547* (B!); Kosto Valley, 4150 m, *Nüsser 1443* (B!); Raikot Gl., nunatak, 3880 m, *Nüsser 441* (B!); Raikot Gl., nunatak, BC, 3900 m, *Nüsser 1303* (B!). — ASTOR: As: Rama Forest, 3350 m, *Schickhoff 1003* (!); Rama Valley, 3780 m, *Nüsser 164* (B!). – Ru: Bazhin Gl. S, 3750 m, *Nüsser 93* (B!); Latobo S, 3900 m, *Nüsser 91* (B!); upper Rupal Valley, 3800 m, *Troll 7432*. 3350-4150 m / mont.-alp.: alluvial fan, avalanche path, dwarf scrub, scrub, turf (*Rhododendron anthopogon*, *Salix karelinii*) / Himalaya: Afgh. – Bhutan, SE Tibet / HIMAL / ch.

A dominant species of subalpine dwarf scrub, also in Gilgit proper. The specimens are referable to *R. anthopogon* var. *hypenanthum* (Balf. f.) Hara.

[*Rhododendron arboreum* Sm.]

ASTOR/KASHMIR: Kamri P. (Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil P. (Kazmi & Siddiqui 1953).

Himalaya: Swat – Assam, Burma / HIMAL / ph.

Doubtful and probably referring to the S slopes (Kishenganga Valley) only.

Rhododendron lepidotum Wall. ex D. Don

ASTOR/DEOSAI: Burzil, *R. R. Stewart* (Cat. Pak.).

Himalaya: Hazara, Kashmir – SE Tibet / HIMAL / ch.

NW limit of distribution.

Euphorbiaceae

Andrachne cordifolia (Decne.) Muell. Arg. (*Leptopus cordifolius* Decne.)

CHILAS: Go: Darang, 1300 m, *Troll 7165*.

1300 m / coll. / W Himalaya: Punjab, Chitral – Nepal / W HIM / ch.

Chrozophora tinctoria (L.) Rafin. (*Croton tinctorius* L.)

CHILAS: Chilas, *Peer* (!); Chilas, 1040 m (*Dickoré*); Chilas – Babusar, 1140 m (*Dickoré*);

Gunar Farm, 1160 m (*Dickoré*). – Go: Darang >, 1450 m, *Dickoré 12694* (!). – Ra: Raikot Bridge, 1170 m, *Dickoré 12528* (!).

1040-1450 m / coll.: desert, ruderal, semi-desert / N Africa, S Europe, SW Asia – India / MEDIT / th.

Euphorbia cornigera Boiss. (*E. pilosa* var. *cornigera* Hook. f. & Thomson)

ASTOR/KASHMIR: Kamri P., 3360 m, *Giles 188* (K!, Fl. Pak. 172).

3360 m / mont. / W Himalaya: Chitral – Kashmir, NW India / W HIM / he.

Euphorbia hispida Boiss. (*E. emodi* Hook. f.)

CHILAS: Go: Gor, 2160 m (*Dickoré*). — ASTOR: Astor Valley, 2440 m, 1892-07-24, *Duthie 12243* (K!, Fl. Pak. 172). – As: Gurikot, *R. R. & I. D. Stewart 18916* (RAW); 2300 m, *Troll 7558*.

2160-2440 m / submont.: ruderal / W Himalaya: Afgh. – NW India / W HIM / th.

Euphorbia kanaorica Boiss.

ASTOR: Ka: Rattu >, *R. R. & I. D. Stewart 18777* (RAW, Fl. Pak. 172).

scree / W Himalaya: E Afgh. – Kunawar / W HIM / he.

Euphorbia micractina Boiss.

ASTOR/DEOSAI: Burzil P., *R. R. & I. D. Stewart 19003* (RAW, Fl. Pak. 172); Mir Panzil P., 1940-07-28, *R. R. Stewart* (RAW, Fl. Pak. 172).

Forest, turf (*Betula*) / Kashmir, Deosai / ENDEM / he.

“This may simply be a high-altitude form of the *cornigera* / *cognata* complex” (Fl. Pak. 172).

[*Euphorbia notoptera* Boiss.]

ASTOR: As: Gurikot, Dak Bungalow lawn, 2430 m, *R. R. Stewart 18916* (Cat. Pak.).

2430 m / submont. / Identity unknown.

Euphorbia osyridea Boiss. (*E. lateriflora* Jaub. & Spach, non Schum. & Thonn.)

CHILAS: Chilias – Babusar, 1140-1500 m (*Dickoré*). — ASTOR: Da: Doian, 1600-1880 m (*Dickoré*); 1660 m, *Nüsser 710* (B!); lower Doian (Mangdoian), 1600 m, *Dickoré 12708* (!).

1140-1880 m / coll.: steppe, scree / Iran, Afgh., Baluch., W Himalaya / IRAN / ch.

A distinctive stiff, wiry subshrub with deciduous leaves; E limit of area.

Euphorbia thomsoniana Boiss.

ASTOR: Ka: Kalapani, 3200 m, 1885, *Giles 174* (K!, Fl. Pak. 172); Rattu >, 2740 m, *R. R. Stewart 22782* (K, Fl. Pak. 172).

2740-3200 m / mont. / rock, scree, scrub / Pamir, Afgh., NW Himalaya / PAMIR / he.

Euphorbia thyrsoides Boiss.

ASTOR: Ka: Kalapani – Shankargarh, *R. R. Stewart & E. Nasir 21781* (RAW, Fl. Pak. 172); Shankargarh, *R. R. Stewart & E. Nasir 21781b* (RAW, Fl. Pak. 172).

Meadow / W Himalaya: Astor, Swat, Hazara, Kashmir / ENDEM / he.

Euphorbia tibetica Boiss.

ASTOR: (Cat. Pak.).

?Pamir, S Karakorum, Ladakh – Kunawur, SW Tibet / TIBET / he.

To be confirmed, more common in S Karakorum, Baltistan, Ladakh.

Fagaceae***Quercus baloot*** Griff. (*Quercus ilex* auct., non L.) / banie (sh), breh (u)CHILAS: Chilas – Babusar, 1850 m (*Dickoré*). – Go: Gor, 2300-2650 m (*Dickoré*); 2420 m, *Dickoré 12651* (!); 2690 m, *Schickhoff 1560* (!); Gor > NW, 2600 m, *Dickoré 12549* (!); Gor, Martal <, 2480 m, *Nüsser 1184* (B!); 2600 m, *Nüsser 1180* (B!); Gor, Terimal, 2500 m, *Troll 7119*.1850-2690 m / coll.-submont.: forest, scrub, steppe-forest (*Cedrus*, *Pinus gerardiana*, *Quercus*) / W Himalaya: Afgh. – Kashmir / W HIM / ph.

Wood used for construction, bark a source of tannine; still gregarious in Gor at its extreme N limit, a valuable source of fodder.

Gentianaceae***Comastoma falcatum*** (Turcz. ex Kar. & Kir.) Toyokuni (*Gentiana falcata* Turcz. ex Kar. & Kir., *Gentianella falcata* (Turcz. ex Kar. & Kir.) H. Smith)CHILAS: Babusar P. NE, 4210 m, *Dickoré 12904* (!); 4210 m, *Dickoré 12905* (!); Babusar Village – Babusar P., *S. Omer & M. Qaiser 2648* (KUH, also cited under *G. borealis*, Fl. Pak. 197).

C. Asia, Karakorum, Tibet / TIBET / th.

Specimens collected on the Babusar P. (leg. *Dickoré*) approach this species, but may actually belong to *C. pedunculatum*.***Comastoma pedunculatum*** (Royle ex G. Don) Toyokuni (*Eurythalia pedunculata* D. Don, *Gentiana pedunculata* Royle ex G. Don, *Gentianella pedunculata* (D. Don) H. Smith) / shernkadj (sh)CHILAS: Go: Gor, 3230 m, *Schickhoff 1538* (!); 3520 m, *Schickhoff 1477* (!).— ASTOR: As: Rama Valley, 3650 m, *Lankester & Pearson 1469* (BM, Fl. Pak. 197); 3960 m, *Lankester & Pearson 1383* (BM, Fl. Pak. 197). – Ru: Rupal Valley, 3300 m, *Nüsser 106* (B!); Rupal Valley, Nagachakali, nunatak, 3620 m, *Nüsser 648* (B!); 3620 m, *Nüsser 609* (B!).3230-4210 m / mont.-alp.: dwarf scrub, forest, moraine, scree, scrub, rock, turf (*Picea*, *Pinus wallichiana*) / Himalaya: Chitral – Bhutan, SE Tibet / HIMAL / th.[*Gentiana argentea* (Royle ex D. Don) DC. (*Ericala argentea* D. Don, *Gentianodes argentea* (Royle ex D. Don) Omer, Ali & Qaiser)]ASTOR: Da: Harchu Valley, 3500-3900 m, *Troll 7293*.

3500-3900 m / subalp.-alp. / W Himalaya: Kashmir – Nepal / W HIM / th.

Doubtful record, apparently primarily a species of the Outer Himalaya.

Gentiana huxleyi Kusn. (*Gentianodes huxleyi* (Kusn.) Qaiser, Omer & Ali, *Gentiana capitata* auct., non Ham. ex D. Don)

ASTOR: As: Rama, *S. Omer* 354 (KUH, Fl. Pak. 197); Rama – Rama Lake, 3650 m, *S. Omer & M. Qaiser* 2395 (KUH, Fl. Pak. 197); Rama RH, 3040 m, *S. Omer & M. Qaiser* 2342 (KUH, Fl. Pak. 197); Rama Valley, 3160 m, *Lankester & Pearson* 1202 (BM, Fl. Pak. 197); Rattu – Gurikot, 2430 m, *F. Schmid* 1780 (RAW, Fl. Pak. 197). – Ru: Rupal Valley, Tap, 3480 m, *Nüsser* 723 (B!); Tarishing, 2910 m, *Nüsser* 785 (B!).
2430-3650 m / submont.-subalp.: alluvial plain, irrigated meadow / Himalaya: Kashmir – SE Tibet, Burma / HIMAL / th.

Gentiana marginata (G. Don) Griseb. (*Ericala marginata* G. Don, *G. carinata* var. *marginata* C. B. Clarke, *Gentianodes eumarginata* Omer, *Gentianodes intermedia* (C. B. Clarke) Omer, Ali & Qaiser, ? *Gentianodes alii* Omer & Qaiser, *Qaisera carinata* (D. Don) Omer)

CHILAS: Go: Gor, Kahlmimay, 3610 m, *Nüsser* 1092 (B!); Gor, Kahlmimay >, 3770 m, *Nüsser* 1105 (B!). – Ra: Bezar Gali E, Sagar, 3750 m, *Nüsser* 534 (B!, cf.); Fairy Meadows, 3390 m, *Nüsser* 952 (B!); Kosto Valley, 4300 m, *Nüsser* 1412 (B!); Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser* 1436 (B!); Raikot Gl., nunatak, 4550 m, *Nüsser* 401 (B!); Raikot Gl., nunatak, BC, 3970 m, *Nüsser* 454 (B!, cf.); 3970 m, *Nüsser* 446 (B!); 3970 m, *Nüsser* 471 (B!, cf.); 4300 m, *Nüsser* 493 (B!); Raikot Valley, Jut, 3330 m, *Nüsser* 937 (B!); Raikot Valley, right slope, 3870 m, *Nüsser* 985 (B!). — ASTOR: As: Rama – Rama Lake, 3650 m, *S. Omer & M. Qaiser* 2383 (KUH, “*G. intermedia*”, Fl. Pak. 197); Rama Valley, 3180 m, *Nüsser* 893 (B!); Rama Valley, near Kareyabe, 3700 m, *Nüsser* 194 (B!); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff* 1018 (!). – Ru: Latobo, 3540 m, *Nüsser* 727 (B!). – Ka: Faqirkot, 3220 m, *Schickhoff* 1361 (!); ? Kalapani >, 3350-3650 m, *Duthie* 12565 (K, “*G. alii*”, Fl. Pak. 197). — ASTOR/KASHMIR: Kamri Kotal, 3960 m, *Giles* 132 (K, “*Qaisera carinata*”, Fl. Pak. 197); Kamri P., 1892-08-26, *Duthie* (BM, E, “*G. alii*”, Fl. Pak. 197). — ASTOR/DEOSAI: Burzil P., R. R. Stewart 19868 (RAW, “*G. eumarginata* var. *harrissii*”, Fl. Pak. 197).

3080-4550 m / mont.-subniv.: alluvial plain, forest, meadow, moist, moraine (*Abies*, *Pinus wallichiana*) / W Himalaya: Kashmir – Nepal / W HIM / th.

Gentiana tianschanica Rupr. ex Kusn. (*Gentiana decumbens* auct., non L. f., *Gentianodes tianschanica* (Rupr. ex Kusn.) Omer, Ali & Qaiser) / khangar katsh (sh)

CHILAS: Babusar, *Shahzad & al.* 364 (BM, Fl. Pak. 197); *S. Omer & M. Qaiser* 2642 (KUH, Fl. Pak. 197); Babusar P., 3960 m, *Metz* 81 (BM, Fl. Pak. 197); 4300 m, *Miehe* 495 (!); Babusar P. NE, 4210 m, *Dickoré* 12881 (!); Babusar Valley, *M. A. Siddiqi* 2730 (Cat. Pak.). – Go: Gor, 3520 m, *Schickhoff* 1504 (!). – Ra: Raikot Gl., nunatak, BC, 4000 m, *Nüsser* 528 (B!); 4030 m, *Nüsser* 521 (B!); Raikot Gl., right lateral moraine, 3410 m, *Nüsser* 310 (B!); Raikot Valley, 3220 m, *Schickhoff* 1656 (!); 3230 m, *Schickhoff* 1621 (!); Raikot Valley, Kilo Sagar, 3700-4000 m, *Troll* 7790; Raikot Valley, Pungadori Lake, 3300 m, *Nüsser* 330 (B!). — ASTOR: Da: Hattu Pir, *Giles* 625 (K, Fl. Pak. 197). – As: Chongra, 3000 m, *Hansen* 202 (!); Gudai Valley, 3350-3650 m, *Duthie* 12201 (O, Fl. Pak. 197); Rama, 3040 m, *E. Nasir & Webster* 6430 (K, RAW, Cat. Pak., Fl. Pak. 197); 3040 m, R. R. Stewart 22894 (K, Fl. Pak. 197); 3200 m, *Lankester & Pearson* 1386 (BM, Fl. Pak. 197); 3200 m, *Lankester & Pearson* 1298 (BM, Fl. Pak. 197); Rama – Rama Lake, 3650 m, *S. Omer & M. Qaiser* 2373 (KUH, Fl. Pak. 197); Rama Valley, left slope, 3650 m, *Nüsser* 219 (B!); Rama Valley, Sachen Gl. <, 3380 m, *Schickhoff* 1001 (!); Sangu Sar [Sango Sar],

on the right side of the Tsinger Gl. [Sachen Gl.], *Schlagintweit* 6585 (P, Fl. Pak. 197); *Schlagintweit* 6579 (P, Fl. Pak. 197). – Ru: Rupal Valley, 3700 m, *Peer* 9 (!); Rupal Valley, Nagachakali, nunatak, 3440 m, *Nüsser* 601 (B!); 3710 m, *Nüsser* 617 (B!); 3810 m, *Nüsser* 654 (B!); upper Mazeno BC, 4320 m, *Nüsser* 1475 (B!); Zaipur >, 3120 m, *Schickhoff* 1054 (!); 3140 m, *Schickhoff* 1097 (!). – Ka: Faqirkot, 3220 m, *Schickhoff* 1353 (!); Kalapani, *Giles* (Cat. Pak.); *Giles* 666 (K, Fl. Pak. 197); 3450 m, *Hansen* 180 (!); Kalapani Valley, 3300 m, *Troll* 8032. — ASTOR/KASHMIR: Kamri (Cat. Pak.). — ASTOR/DEOSAI: Burzil P. (Cat. Pak., Kazmi & Siddiqui 1953); upper Burzil Valley, 3350 m, *R. R. Stewart* 22014 (K, Fl. Pak. 197).

3000-4320 m / mont.-alp.: among boulders, dwarf scrub, turf, scree, rock, forest, moraine, scrub, turf (*Abies*, *Betula*, *Picea*, *Pinus wallichiana*) / Tian Shan, Pamir, W Himalaya / PAMIR / he.

Medicinal.

Gentianella aurea (L.) H. Smith (*Gentiana aurea* L., *Gentiana umbellata* M. Bieb., *Gentiana stoliczkae* C. B. Clarke, *Gentianella holosteoides* Pritchard, *Aloitis stoliczkae* (C. B. Clarke) Omer, Qaiser & Ali)

ASTOR: Da: Turbaling, 2700 m, *Troll* 7886 (“*G. aurea* var. *sibirica*”). – As: Gudai, 2740 m, *R. R. & I. D. Stewart* 18935 (NA, “*G. stoliczkae*”, Fl. Pak. 197).

2700-2740 m / mont. / Arctic Eurasia & N America, C. Asia / CIRC POL / th.

Gentianella borealis (Bunge) H. Smith (*Comastoma borealis* (Bunge) T. N. Ho, *Gentiana borealis* Bunge)

CHILAS: Babusar Village – Babusar P., *S. Omer & M. Qaiser* 2648 (KUH, Fl. Pak. 197). – Go: Gor, 3230 m, *Schickhoff* 1536 (!). – Pa: Diamir Valley, 3150 m, *Schickhoff* 2463 (!, cf., veg.). – Ra: Raikot Valley, 3220 m, *Schickhoff* 1664 (!); 3230 m, *Schickhoff* 1614 (!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser* 332 (B!). – Bu: Muthat, 2900 m, *Troll* 7837 (“*Gentiana acuta* subsp. *plebeja*”). — ASTOR: Da: Mushkin Forest, 2900 m, *Schickhoff* 1404 (!); 3000 m, *Schickhoff* 1428 (!). – Ru: Zaipur >, 3140 m, *Schickhoff* 1091 (!).

2900-3300 m / mont.: forest (*Picea*, *Pinus wallichiana*) / C. Asia, Tian Shan, Pamir, Karakorum, NW Himalaya / C AS / th.

Gentianopsis paludosa (Munro ex Hook. f.) Ma (*Gentiana detonsa* var. *stracheyi* C. B. Clarke, *Gentiana paludosa* Munro ex Hook. f.)

ASTOR: As: Chillam, *R. R. Stewart* 22027 (Cat. Pak.); Gudai Valley, 3350-3650 m, 1892-07-22, *Duthie* (O, Fl. Pak. 197). – Ru: Rupal Valley, 3300 m, *Nüsser* 105 (B!). – Ka: Rattu, 2700 m, *Troll* 7956 (“*G. detonsa* var. *barbata*”), Rattu >, 2430-2740 m, *R. R. Stewart* 22799 (K, Cat. Pak., Fl. Pak. 197). — ASTOR/KASHMIR: Kamri (Cat. Pak.). — ASTOR/DEOSAI: Burzil P. (Cat. Pak.).

2430-3650 m / submont.-subalp.: meadow, moist / Himalaya, SE Tibet, China / HIMAL / th. The closely related *G. vvedenskyi* is vicarious in the inner ranges (Karakorum).

Jaeschkea oligosperma (Griseb.) Knobl. (*Gentiana oligosperma* Griseb., *Jaeschkea gentianoides* S. Kurz)

CHILAS: Bu: Buldar Valley, Mamocha Peak <, 3400-3800 m, *Troll* 7859 (“*J. gentianoides*”).

— ASTOR: 2310 m, *Giles 579* (K, Fl. Pak. 197). — As: Rama Valley, 3200 m, *Lankester & Pearson 1302* (BM, Fl. Pak. 197); Rama Valley, left slope, 3620 m, *Nüsser 206* (B!); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1016* (!). — Ru: Rupal Ridge, 3500 m, *Nüsser 132* (B!); Rupal Valley, 3140 m, *Nüsser 129* (B!); 3300 m, *Nüsser 101* (B!); village Lower Rupal, 3100 m, *Nüsser 1582* (B!). — Ka: Faqirkot, 2980 m, *Schickhoff 1328* (!); Rattu, 2700 m, *Troll 7955* (“*J. gentianoides*”).
2310-3800 m / submont.-subalp.: forest (*Abies*, *Pinus wallichiana*) / Himalaya (E Afgh. – Sikkim) / HIMAL / th.

Lomatogonium carinthiacum (Wulfen) A. Br. (*Swertia carinthiaca* Wulfen, *Pleurogyne carinthiaca* (Wulfen) Griseb.)

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12906* (!); Babusar Village – Babusar P., *S. Omer & M. Qaiser 2674* (KUH, Fl. Pak. 197). — Ra: Fairy Meadows, 3310 m, *Nüsser 364* (B!); Raikot Gl. – Ganalo Gl. confluence, 3650 m, *Nüsser 302* (B!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 347* (B!). — ASTOR: Da: Doian >, 1892-08-14, *Duthie* (E, Fl. Pak. 197). — Ru: Lower Rupal Valley, *R. R. Stewart 18877* (RAW, Fl. Pak. 197); Rupal Valley, *R. R. Stewart* (Cat. Pak.); Hasora, Tashing (NW of Astor), 1856-09-15/23, *Schlagintweit* (Z!). — Ka: Rattu, 2700 m, *Troll 7957*; Rattu >, *R. R. Stewart 22797* (K, Fl. Pak. 197). — ASTOR/DEOSAI: Burzil P., *R. R. & I. D. Stewart 19035* (RAW, Fl. Pak. 197); *R. R. & I. D. Stewart 19020* (RAW, Fl. Pak. 197).
2700-4210 m / mont.-alp.: dwarf scrub, flush, rock, scree, turf / C. Europe, Asia / EURAS / th.

Lomatogonium coeruleum (Royle) Harry Sm. ex B. L. Burtt (*Swertia coerulea* Royle)

CHILAS: Pa: Bunar Valley, Loiba 3900 m, *Peer* (!). — Ra: Ganalo Gl., nunatak, BC, 4200 m, *Nüsser 517* (B!); Raikot Gl., nunatak, BC, 3990 m, *Nüsser 461* (B!). — ASTOR: As: Rama – Rama Lake, *S. Omer & M. Qaiser 2374* (KUH, Fl. Pak. 197); Rama Valley, Sachen Gl. <, 3380 m, *Schickhoff 999* (!). — ASTOR/DEOSAI: Burzil P., *Duthie 14036* (Cat. Pak.).
3380-4200 m / mont.-alp.: forest (*Abies*, *Betula*) / W Himalaya: E Afgh. – NW India / W HIM / he.

[*Lomatogonium spathulatum* (Kerner) Fernald (*Pleurogyne spathulata* Kerner)]

ASTOR: As: Rama, *Omer & Qaiser 2366* (KUH, Fl. Pak. 197); Rama – Astor, *Omer & Qaiser 2422* (KUH, Fl. Pak. 197).

W Himalaya: Hazara, Kashmir – NW India / W HIM / th.

Doubtful, the records may refer to *L. carinthiacum*. The identity of Kerner’s plant is not quite certain, but probably refers to a robust species of the Outer Himalaya.

Swertia cordata (G. Don) C. B. Clarke (*Ophelia cordata* G. Don)

CHILAS: Go: Gor, 2400 m, *Dickoré 12534* (!); Gor > NW, 2600 m, *Dickoré 12546* (!). — ASTOR: (Cat. Pak.). — Da: Mushkin RH – Turbaling, 2620 m, *Dickoré 12744* (!). — As: Rama – Astor, *S. Omer & M. Qaiser 2406* (KUH, Fl. Pak. 197); Rama RH, *S. Omer & M. Qaiser 2332* (KUH, Fl. Pak. 197). — ASTOR/KASHMIR: Kamri P. (Cat. Pak.).
2400-2620 m / submont.: forest, moist, steppe-forest (*Pinus gerardiana*, *Pinus wallichiana*, *Quercus*, *Salix wallichiana*) / Himalaya: E Afgh. – SE Tibet, Burma / HIMAL / th.

Swertia petiolata Royle ex D. Don / bahu shah, hajaton jabbatti (sh)

CHILAS: Babusar P., 4300 m, *Miehe 475* (!); Babusar P. NE, 4210 m, *Dickoré 12920* (!). – Pa: Bunar Valley, Loiba 3900 m, *Peer* (!); Pattaro Valley, Guttum Sagar, 4260 m, *Nüsser 1360* (B!); Pattaro Valley, Guttum Sagar >, 4450 m, *Nüsser 1343* (B!). – Ra: Raikot Gl., nunatak, 4180 m, *Nüsser 408* (B!, cf.); Raikot Valley, 3300-4000 m, *Troll 7722*. — ASTOR: Ru: Bunar Valley, Loiba, 3900 m, *Peer 37* (!); Rupal Valley, Tap, 3560 m, *Nüsser 96* (B!). – Ka: Faqirkot, 2750 m, *Hansen 148* (!, cf.); Kalapani, 3400 m, *Hansen 99* (!). — ASTOR/KASHMIR: Kamri P., *Giles 692* (“var. *lahulensis*”, Cat. Pak.); R. R. Stewart 22680 (K, Cat. Pak., Fl. Pak. 197).
2750-4450 m / mont.-alp.: dwarf scrub, rock, scree, turf / Himalaya: Kashmir – Nepal, SE Tibet / HIMAL / he.

[*Swertia speciosa* var. *perfoliata* (Royle ex G. Don) C. B. Clarke (*S. perfoliata* Royle ex G. Don)]

ASTOR/DEOSAI: Burzil P. (Cat. Pak.).

W Himalaya: Hazara – NW India / W HIM / he.

Doubtful, may refer to *S. thomsonii*.

Swertia thomsonii C. B. Clarke

ASTOR: As: Gudai – Chillam, *S. Omer & M. Qaiser 2499* (KUH, Fl. Pak. 197); Rama (Cat. Pak.). – Ka: Rattu, R. R. Stewart 22928 (Cat. Pak.).
Subalp.: swampy soil / W Himalaya: Hazara, Kashmir / ENDEM / he.

Geraniaceae (incl. *Biebersteiniaceae*)***Biebersteinia odora*** Steph. ex Fisch.

CHILAS: Babusar P., *Metz 89* (RAW!, Fl. Pak. 129); 4300 m, *Miehe 555* (!).
4300 m / alp.: scree / Pamir, Karakorum, W Himalaya / W HIM / he.

Erodium cicutarium (L.) L’Her. ex Aiton (*Geranium cicutarium* L.) / Common Stork’s-bill (e)

CHILAS: Go: Darang >, 1450 m, *Dickoré 12699* (!). — ASTOR: Ru: Rupal Valley, Nahake – Gageh, 2850 m, *Nüsser 779* (B!).

1450-2850 m / coll.-mont.: scrub, ruderal / N Africa, Europe, Asia (introduced N America) / EURAS / th.

Extends along Indus to Gilgit and Skardu.

Erodium oxyrrhynchum M. Bieb.

ASTOR: Da: Ramghat, 1200-1800 m, *Troll 7083* (“*E. bryoniifolium*”).

1200-1800 m / coll. / N Africa, SW & C. Asia, E to Baluch., Punjab, S Karakorum / IRAN / th.

Extends along the Indus and tributaries up to Gilgit, Hunza, Baltistan and Ladakh.

[*Geranium collinum* Steph. ex Willd.]

ASTOR: (Cat. Pak. “var. *glandulosum*”).

SE Europe, W & C. Asia, Karakorum, W Himalaya: Chitral / C AS / he.

Doubtful, record may also refer to *G. himalayense* or *G. swatense*. True *G. collinum* with whitish flowers occurs in the inner ranges of Chitral, Karakorum and Ladakh.

Geranium himalayense Klotzsch ex Hoffmeister & al. / pour ponour (sh)

CHILAS: Go: Gor > NW, 2950 m, *Dickoré* 12637 (!). – Pa: Diamir Valley, 2970 m, *Schickhoff* 2432 (!); 3150 m, *Schickhoff* 2440 (!); Diamir Valley, 4000 m, *Peer* (!). — ASTOR: Da: Mushkin Forest, 2580 m (*Schickhoff* 1115); Mushkin Forest, RH, 2700 m, *Nüsser* 254 (B!, cf.); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser* 243 (B!); Mushkin RH – Turbaling, 2620 m, *Dickoré* 12736 (!); Mushkin RH <, 2580 m, *Dickoré* 12718 (!). – As: Das Kirim Valley, Chilim >, 3100 m, *Miehe* 950701 (!). – Ru: Zaipur >, 3120 m, *Schickhoff* 1050 (!); 3140 m (*Schickhoff* 1087). – Ka: Kalapani, 3500 m, *Hansen* 97 (!). — ASTOR/KASHMIR: Kamri P., 1946-07-14, *R. R. Stewart & E. Nasir* (RAW, Fl. Pak. 149). — ASTOR/DEOSAI: Burzil, 3350-3650 m, *Duthie* 14027 (E, Fl. Pak. 149); Burzil Chowki, 3040-3350 m, *R. R. Stewart* 19754 (RAW, Fl. Pak. 149); Burzil P., *R. R. & I. D. Stewart* (Fl. Pak. 149).

2580-4000 m / submont.-subalp.: forest, moist (*Abies*, *Picea*, *Pinus wallichiana*, *Salix wallichiana*) / W Himalaya: Afgh. – Nepal / W HIM / he.

[*Geranium palustre* L.]

ASTOR: Ka: Kalapani Valley, 3300 m, *Troll* 8033.

3300 m / mont. / he.

May have been identical with *G. himalayense*; no subsequent records from the Himalayas.

[*Geranium pinetophilum* R. Knuth]

CHILAS: Pa: Jiliper Valley, 2800-3000 m, *Troll* 7678. – Ra: Fairy Meadows, 3300 m, *Troll* 7637 (B, type of *G. pinetophilum*, destroyed).

2800-3300 m / mont. / he.

Maybe identical with *G. pratense* subsp. *stewartianum*.

Geranium pratense subsp. *stewartianum* Y. Nasir / Meadow Crane's-bill (e)

CHILAS: Go: Gor, 3230 m (*Schickhoff* 1515); 3520 m, *Schickhoff* 1496 (!); Gor, Martal, 2930 m, *Nüsser* 1083 (B!). – Ra: Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser* 1428 (B!); Raikot Gl. – Ganalo Gl. confluence, 3850 m, *Nüsser* 299 (B!); Raikot Gl., nunatak, 3900 m, *Nüsser* 425 (B!, cf.); Raikot Gl., nunatak, BC, 3910 m, *Nüsser* 1283 (B!); 3970 m, *Nüsser* 468 (B!, cf.); 4000 m, *Nüsser* 529 (B!, cf.); 4030 m, *Nüsser* 522 (B!, cf.); Raikot Valley, 3220 m (*Schickhoff* 1655); 3230 m (*Schickhoff* 1602); 3560 m (*Schickhoff* 1634); Raikot Valley, Bayal, 3600 m, *Nüsser* 1278 (B!). – Bu: Buldar Valley, Fary, 2860 m, *Nüsser* 1031 (B!). — ASTOR: Da: Mushkin Forest, 2900 m (*Schickhoff* 1384); 3000 m (*Schickhoff* 1415); Mushkin RH <, 2580 m, *Dickoré* 12721 (!). – As: Rama, 3040 m, *R. R. Stewart & E. Nasir* 22898 (K, “var. *schmidii*”, Fl. Pak. 149); 3040 m, *R. R. Stewart & E. Nasir* 22898a (RAW, “var. *schmidii*”, Fl. Pak. 149); 3770 m, *Lankester & Pearson* 1209 (BM, “var. *schmidii*”, Fl. Pak. 149); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff* 1010 (!); 3220 m, *Schickhoff* 963 (!); 3380 m, *Schickhoff* 981 (!). – Ru: Latobo, Tap Gl., left lateral moraine,

3630 m, *Nüsser 34* (B!); Rupal Valley, lower Mazeno BC moraine, 4050 m, *Nüsser 1533* (B!); Rupal Valley, Nagachakali, nunatak, 3810 m, *Nüsser 655* (B!, cf.); Tap, 3500 m, *Troll 7436*; upper Mazeno BC, 4320 m, *Nüsser 1458* (B!); upper Rupal Valley, 3500 m, *Troll 7441*. – Ka: Faqirkot, 2980 m, *Schickhoff 1300* (!); 3220 m, *Schickhoff 1349* (!); Kalapani, 3050 m, *Schickhoff 1275* (!). — ASTOR/DEOSAI: Burzil Chowki, 3350-3650 m, *R. R. & I. D. Stewart 19134* (RAW, “var. *schmidii*”, Fl. Pak. 149); Burzil P. top, 4110 m, 1946-08, *R. R. & I. D. Stewart* (RAW, “var. *schmidii*”, Fl. Pak. 149); Mir Panzil P. nr., 4260 m, *R. R. Stewart 19941a* (RAW, “var. *schmidii*”, Fl. Pak. 149).

2580-4320 m / submont.-alp.: among boulders, dwarf scrub, forest, meadow, moraine, scrub (*Abies*, *Artemisia santolinifolia*, *Betula*, *Cedrus*, *Pinus wallichiana*, *Salix wallichiana*) / SW Karakorum, W Himalaya: Gilgit, Astor, Kashmir (for *G. pratense*: Europe, Asia) / W HIM / he.

***Geranium sibiricum* L.**

ASTOR: Da: Doian, *Duthie 12465* (Cat. Pak.). – As: Gudai – Chillam, 2590-2740 m, *R. R. Stewart 18958* (RAW, Fl. Pak. 149).

2590-2740 m / submont.-mont. / E Europe, Asia / EURAS / th.

Also along the Indus in Baltistan and Ladakh, apparently isolated outposts on the SE limit of its distribution.

***Geranium swatense* Schönbr.-Temesy**

CHILAS: Babusar, 2740 m, *M. H. Khan 8970* (RAW, Fl. Pak. 149); Babusar Valley, 3200 m, *Schickhoff 1692* (!). — ASTOR: Da: Mushkin Forest, 2740-3040 m, *Duthie 12261* (E, BM, K, LE, Fl. Pak. 149, Cat. Pak.: “*G. collinum* var. *eglandulosum*”). – As: Rama, *E. Nasir & Webster 6465* (RAW, Fl. Pak. 149); 3040 m, *R. R. & I. D. Stewart & E. Nasir 22897a* (RAW, Fl. Pak. 149); 3810 m, *Lankester & Pearson 1246* (BM, “flowers pink with deeper veins”, Fl. Pak. 149).

2740-3810 m / mont.-subalp.: forest (*Pinus wallichiana*) / W Himalaya (Swat, Chilas, Astor) / ENDEM / he.

Though the species appears to be distinct, there may be problems to delimit it against *G. himalayense* and *G. collinum*; records from Astor proper may need confirmation.

***Geranium wallichianum* D. Don ex Sweet / laljhari, rattanjot (u)**

ASTOR: As: Sagar, Astor side, *M. B. Zaman 114* (RAW, cf., “*G. rectum*”, Fl. Pak. 149). –

Ka: Kalapani, 3040 m (Kazmi & Siddiqui 1953); 3260 m, *Schickhoff 1218* (!).

3040-3260 m / mont.: forest (*Abies*) / W Himalaya: Afgh. – Bhutan / W HIM / he.

NW limit of distribution, common on the Himalaya S slopes. A record of *G. rectum* Trautv. is tentatively included here.

Grossulariaceae

***Ribes alpestre* Decne. ex Jacquem. (*R. grossularia* sensu Wall., non L.)**

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2754* (Fl. Pak. 27). – Go: Gor, 2800 m, *Troll 7149*; 3230 m, *Schickhoff 1514* (!); Gor, Kahlmayer <, 3390 m, *Nüsser 1124* (B!); Gor, Martal, 2920 m, *Nüsser 1155* (B!). — ASTOR: As: Gudai, *R. R. Stewart 19142*

(Cat. Pak.); Rama Forest, 2740 m, 1969-08, *Cheema* (KUH, Fl. Pak. 27).

2740-3960 m / mont.-alp.: forest (*Picea*, *Pinus wallichiana*) / Himalaya: Afgh. – SE Tibet, W China / HIMAL / np.

***Ribes glaciale* Wall.**

ASTOR: Ru: Rupal Valley, Nagachakali, nunatak, 3900 m, *Nüsser 661* (B!, cf.). — ASTOR/KASHMIR: Kamri P., *Duthie* (Cat. Pak.).

3900 m / alp.: moraine / Himalaya: Swat – SE Tibet, W China / HIMAL / np.

***Ribes himalense* Decne. (*R. emodense* Rehder) / hargili (sh), karan (u)**

ASTOR: Da: Harchu Valley, Baro Nirril, 3200 m, *Troll 7284*. – Ru: Rupal Valley, Bayals, 3160 m, *Nüsser 594* (B!, cf.). – Ka: Kalapani, *Giles 169* (“*R. emodense*”, Cat. Pak.). — ASTOR/KASHMIR: Kamri P., 2830-3040 m, *E. Nasir & Webster 6254* (RAW, Fl. Pak. 27). 2830-3200 m / mont. / Himalaya: Kashmir – Bhutan, SE Tibet, China / HIMAL / np.

Berries edible.

***Ribes nigrum* L. / *furpotti*, *hargil* (sh), beli, karan, nabar (u), Black Currant (e)**

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 275* (RAW, Fl. Pak. 27). — ASTOR: Da: Doian, 3000 m, *Troll 7565*; Mushkin RH – Turbaling, 2620 m, *Dickoré 12745* (!). – As: Astor, 2310 m (Kazmi & Siddiqui 1953); Bulashbar Bridge, 2420 m, *Nüsser 812* (B!); Chillam, *R. R. Stewart 18956* (Cat. Pak.); Gudai, 2740 m, *R. R. & I. D. Stewart 18937* (RAW, Fl. Pak. 27); Rama, *R. R. & I. D. Stewart 21884* (RAW, Fl. Pak. 27); Rama Forest (Kazmi & Siddiqui 1953). – Ru: Rupal Valley, *R. R. Stewart 18873* (RAW, Fl. Pak. 27). – Ka: Faqirkot, 2800 m, *Hansen 110* (!); Rattu >, *R. R. Stewart 22803* (Cat. Pak.).

2310-3960 m / submont.-alp.: forest, moist (*Pinus wallichiana*, *Salix wallichiana*) / Europe, Asia / EURAS / np.

Fruit edible, medicinal. Probably native.

***Ribes orientale* Desf. (*R. heterotrichum* C. A. Mey., *R. leptostachyum* Decne., *R. villosum* Wall.) / shotu, shatu (sh), askutar (u)**

CHILAS: Go: Gor, 2420 m, *Dickoré 12661* (!). — ASTOR: (Cat. Pak.). – Da: Doian, 2500 m, *Troll 7906*; Harchu Valley, Karmi Haray, 2740 m, *Nüsser 833* (B!); Mushkin Forest, 2580 m, *Schickhoff 1129* (!); 2580 m, *Schickhoff 1136* (!); Mushkin RH – Turbaling, 2620 m, *Dickoré 12747* (!); Mushkin RH > SE, 2770 m, *Dickoré 12792* (!). – As: Gudai, 2600 m, *Troll 7039*; Gurikot, 2500 m, *Troll 7360*; Rampur (Kazmi & Siddiqui 1953). – Ru: Churit – Bulashbar, 2480 m, *Nüsser 801* (B!); Rupal Valley, Nahake – Tarishing, 2880 m, *Nüsser 778* (B!); Tarishing – Churit, 2730 m, *Nüsser 150* (B!). – Ka: Faqirkot, 2700 m, *Hansen 190* (!).

2420-2880 m / submont.-mont.: among boulders, forest, rock, scrub, steppe-forest (*Pinus wallichiana*, *Quercus*, *Salix wallichiana*) / SE Europe – S & C. Asia / C AS / np.

Medicinal.

***Guttiferae* (*Hypericaceae*)**

***Hypericum perforatum* L. / bassant (u), Perforate St John's-wort (e)**

ASTOR: (Cat. Pak.). – Da: Bunji, *Giles 392* (K, Fl. Pak. 32). – Ka: Rattu, 2130-2740 m

(Kazmi & Siddiqui 1953); 2800 m, *Troll 7966*; Rattu >, *R. R. & I. D. Stewart 18784* (RAW, Fl. Pak. 32).

2130-2800 m / mont. / N Africa, Europe, W & C. Asia (introduced S Africa, E Asia, Australia, America) / EURAS / he.

Medicinal, poisonous to livestock.

Hippocastanaceae

[*Aesculus indica* Hiern. / hane, hanudum, kakra (u), Indian Chestnut (e)]

ASTOR: Astor Valley, "occasional" (Kazmi & Siddiqui 1953).

Doubtful record, which may refer to the Kishenganga Valley only, or cultivated trees. It is, however, very common in the Outer W Himalaya. A valuable timber tree, medicinal.

Hippuridaceae

Hippuris vulgaris L. / Mare's-tail (e)

ASTOR: As: Rama (Cat. Pak.). – Ka: Rattu, 2700 m, *Troll 7952*.

2700 m / mont.: fen, flush, lake / Europe, Asia, N & S America / CIRC POL / he.

Juglandaceae

Juglans regia L. / akhrot (u), Walnut (e)

CHILAS: Chilas – Babusar, 1200 m (*Dickoré*). – Go: Gor, 2160 m (*Dickoré*). — ASTOR: Da: Doian, 2570 m (*Dickoré*). – Ru: Churit, 2730-2750 m (*Nüsser*).

1200-2750 m / coll.-submont. / SE Europe, SW Asia, Himalaya: Afgh. – SW China / EURAS / ph.

Status unknown, possibly cultivated only; a valuable timber and fruit tree, also used medicinally, for bark gum, staining and as fodder.

Labiatae (Lamiaceae)

Clinopodium umbrosum (Fisch. & C. A. Mey.) Kuntze

CHILAS: Go: Gor, 2690 m, *Schickhoff 1588* (!). — ASTOR/DEOSAI: [?] Burzil P., *R. R. Stewart* (RAW, Fl. Pak. 192).

2690 m / submont.: steppe-forest (*Pinus gerardiana*) / SW, S & SE Asia / HIMAL / th.

Clinopodium vulgare L. (*Calamintha clinopodium* Benth., *Calamintha vulgaris* (L.) Druce, *Satureia vulgaris* (L.) Fritsch) / azumar (sh), asaba-el-fatayat (u), Wild Basil (e)

ASTOR: Ru: Rupal Valley, Bayals, 3160 m, *Nüsser 587* (B!); Rupal Valley, Nagachakali, nunatak, 3620 m, *Nüsser 647* (B!). – Ka: Kalapani, 3040 m (Kazmi & Siddiqui 1953); Rattu – Kalapani, 2800-3300 m, *Troll 7963*.

2800-3620 m / mont.-subalp.: dwarf scrub, moraine, scrub / N Africa, Europe, Asia / EURAS / he.

Dracocephalum bipinnatum Rupr. (*D. ruprechtii* Regel)

ASTOR: As: Gurikot, Gilgit Rd., 2450 m, *R. R. & I. D. Stewart 18918* (RAW, Fl. Pak. 192). – Ru:

Rupal Valley, 2560 m, *Duthie 12246* (E, Fl. Pak. 192). – Ka: Shankargarh, *Giles 38* (Cat. Pak.). 2450-2560 m / submont. / Tian Shan, Pamir, W Himalaya: Afgh. – Nepal / PAMIR / he.

Dracocephalum nutans L. (*D. nuristanicum* Rech. f. & Edelm.)

ASTOR: Ka: Kalapani, 3260 m, *Schickhoff 1231* (!); Kalapani Valley, 2800-3200 m, *Troll 7998*. — ASTOR/DEOSAI: Burzil P., Gilgit Rd., *R. R. Stewart 19902* (RAW, Fl. Pak. 192). 2800-3260 m / mont.: forest, scree, scrub (*Abies*) / Siberia, C. Asia, Tian Shan, Pamir, W Himalaya / C AS / he.

Elsholtzia ciliata (Thunb.) Hylander (*E. cristata* Willd., *Mentha patrinii* Lepech., *E. patrinii* (Lepech.) Garcke, *Sideritis ciliata* Thunb.)

CHILAS: Go: Gor, 2400 m, *Dickoré 12532* (!). — ASTOR: Da: Mushkin RH – Turbaling, 2620 m, *Dickoré 12749* (!).

2400-2620 m / submont.: forest, moist, steppe-forest (*Pinus wallichiana*, *Quercus*, *Salix wallichiana*) / E Europe, Asia / EURAS / th.

Elsholtzia densa Benth. (*Paulseniella pamirensis* Briq.)

ASTOR: Ka: Rattu (Cat. Pak.).

Himalaya: Afgh. – Bhutan, Tibet, China / HIMAL / th.

Elsholtzia eriostachya Benth.

ASTOR: *Schlagintweit 7414* (Cat. Pak.).

Himalaya: Kashmir – Sikkim, Tibet / HIMAL / th.

Isodon rugosus (Wall. ex Benth.) Codd / kwangere (u)

CHILAS: Go: Gor, 2200 m (*Dickoré*).

2200 m / submont. / SE Arabia: Oman, Afgh., Baluch., Himalaya: Chitral – Nepal, SW China / HIMAL / ch.

One of the most common plants and dominant on dry slopes of the Outer W Himalaya, rare along the Indus tributaries up to Hunza / Shimshal.

Lallemantia royleana (Benth.) Benth. (*Dracocephalum royleanum* Benth.) / takht malingia, tukhm malanga, tukhm longa (u)

ASTOR: Da: Mushkin, 1900 m, *Troll 7253*.

1900 m / coll. / SW & C. Asia / IRAN / th.

Medicinal.

Lamium album L. / White Dead Nettle (e)

ASTOR: Ka: Kalapani Valley, 3200 m, *Troll 7996*.

3200 m / mont. / Europe, Asia / EURAS / he.

Leonurus cardiaca subsp. *turkestanicus* (V. Krecz. & Kuprian.) Rech. f. / shanto (sh), Motherwort (e)

ASTOR: As: Chongra, *Hansen 124* (!). – Ka: Kalapani, 3050 m, *Schickhoff 1268* (!);

Kalapani Valley, 2900-3200 m, *Troll 8003* (“*L. cardiaca*”).
2900-3200 m / mont.: dwarf scrub (“*Artemisia santolinifolia*”) / NE Iran, Tian Shan, Pamir, Afgh., W Himalaya (species: Europe, Asia) / PAMIR / he.
Medicinal.

Mentha royleana Benth. (*M. longifolia* auct., non (L.) Huds., *M. sylvestris* auct., non L.) / phelil, philil (sh), podina (u)
CHILAS: Go: Gor, Ranote, 2120 m, *Nüsser 1189* (B!); Thelichi, 1260 m, *Dickoré 12516* (!). – Ra: Tato – Fairy Meadows, 3060 m, *Nüsser 979* (B!). — ASTOR: ? (“*M. longifolia* subsp. *longifolia*”, Cat. Pak.). – Da: Indus Valley, KKH – Old Bunji Bridge, 1310 m, *Nüsser 708* (B!). 1260-3060 m / coll.-mont.: moist, semi-desert / W Himalaya: Afgh. – NW India / W HIM / he.
Medicinal. Doubtfully distinct from *M. longifolia*.

Mentha spicata L. emend. Huds. (*M. viridis* L.) / Spear Mint (e)
ASTOR: As: Astor Bazar, Hotel, 2440 m, *Dickoré 12813* (!).
2440 m / submont.: garden, ruderal / Europe, Asia / EURAS / he.
Medicinal, possibly cultivated only. An unlocalised record of *M. arvensis* L. (Kazmi & Siddiqui 1953) may belong to here.

Nepeta adenophyta Hedge / charchumero (sh)
ASTOR: As: Chongra, 3000 m, *Hansen 143* (!); Das Kirim, *R. R. Stewart 22959* (Cat. Pak.); Rama, 3200 m, *Swed. Exp. A-6479* (GB, Fl. Pak. 192); Rama Valley, 3140 m, *Lankester & Pearson 1315* (K, type of *Nepeta adenophyta* Hedge, Fl. Pak. 192); 3200 m, *Lankester & Pearson 1390* (K, Fl. Pak. 192). – Ru: Rupal Valley, *R. R. Stewart 18833* (Cat. Pak.).
3000-3200 m / mont. / Astor / ENDEM / ch.
Habitually distinctive, but closely related to *N. glutinosa*, probably the most localised endemic of Nanga Parbat; medicinal.

Nepeta cataria L. (*N. calaminthoides* Benth.) / Cat-mint (e)
CHILAS: Ra: Tato, 2400 m, *Troll 7830*.
2400 m / submont. / Europe, SW & C. Asia (widely introduced: Australia, N America) / CIRC POL / he.

Nepeta clarkei Hook. f.
CHILAS: Babusar Village, *M. A. Siddiqi & Y. Nasir 2783* (RAW, Fl. Pak. 192). – Ra: Kosto Valley, 3800 m, *Nüsser 1453* (B!). — ASTOR: As: Gurikot – Das Kirim, *R. R. Stewart 22971* (Cat. Pak.). – Ka: Shankargarh, *R. R. Stewart 1876* (RAW, Fl. Pak. 192); *Giles 639* (Cat. Pak.). — ASTOR/KASHMIR: Kamri P. (Cat. Pak.). — ASTOR/DEOSAI: Burzil P. (Cat. Pak.).
3800 m / subalp.: scree / boulders / W Himalaya: Chitral – NW India / W HIM / he.

Nepeta connata Royle ex Benth.
ASTOR: As: Gudai Valley, 3500 m, 1892-07-22, *Duthie* (E, Fl. Pak. 192). – Ru: Chugam – Rattu, 2600 m, *Troll 7940*. – Ka: Faqirkot, 2980 m, *Schickhoff 1333* (!); Kalapani, *R. R. Stewart* (Cat. Pak.); *Giles 28* (Cat. Pak.). — ASTOR/KASHMIR: Kamri P. (Cat. Pak.).

2600-3500 m / submont.-subalp.: forest (*Pinus wallichiana*) / W Himalaya: Hazara, Astor, Kashmir / ENDEM / he.

Nepeta discolor Royle ex Benth.

CHILAS: Go: Gor, 3230 m, *Schickhoff 1517* (!); 3520 m, *Schickhoff 1487* (!); Gor > NW, 2770 m, *Dickoré 12593* (!); 2950 m, *Dickoré 12644* (!); Gor, Martal, 2930 m, *Nüsser 1075* (B!). – Pa: Pattaro Valley, Guttum Sagar >, 4450 m, *Nüsser 1345* (B!). – Ra: Raikot Gl. – Ganalo Gl. confluence, 3900 m, *Nüsser 287* (B!); Raikot Gl., nunatak, 3880 m, *Nüsser 433* (B!); Raikot Gl., nunatak, BC, 4000 m, *Nüsser 530* (B!); 4030 m, *Nüsser 523* (B!); Raikot Valley, 3220 m, *Schickhoff 1681* (!); Raikot Valley, Pungadori, 3240 m, *Nüsser 913* (B!); 3290 m, *Nüsser 342* (B!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 318* (B!). — ASTOR: (Cat. Pak.); Astor Valley, *Inayat 25745* (K, Fl. Pak. 192). – Da: Harchu Valley, Baro Nirril >, 3230 m, *Nüsser 878* (B!); Mushkin Forest, 2580 m, *Schickhoff 1140* (!). – As: Das Kirim Valley, Chilim, 3250 m, *Miehe 950802* (!); Rama Valley, left slope, 3620 m, *Nüsser 208* (B!). – Ru: Rupal Ridge, 3500 m, *Nüsser 131* (B!); Rupal Valley, 3600 m, *Peer 11* (!); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1553* (B!); Rupal Valley, Tap, 3460 m, *Nüsser 741* (B!); upper Mazeno BC, 4320 m, *Nüsser 1467* (B!). – Ka: Faqirkot, 2980 m, *Schickhoff 1327* (!). — ASTOR/KASHMIR: Kamri P., R. R. Stewart 22739 (Cat. Pak.). — ASTOR/DEOSAI: Burzil P., C. B. Clarke 29608a (Cat. Pak.).

2580-4450 m / submont.-alp.: among boulders, forest, meadow, scrub, steppe-forest (*Cedrus*, *Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / Pamir, Afgh., S Karakorum, W Himalaya: Chitral, Kashmir – Nepal / W HIM / he.

Nepeta eriostachys Benth.

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1757* (!). – Go: Gor > NW, 2770 m, *Dickoré 12590* (!). – Ra: Raikot Gl., nunatak, 3880 m, *Nüsser 436* (B!, cf.); Raikot Gl., nunatak, BC, 3910 m, *Nüsser 1291* (B!). — ASTOR: *Duthie 12488* (E, Fl. Pak. 192). – Ka: Shankargarh >, R. R. Stewart 22759 (Cat. Pak.).

2750-3910 m / mont.-subalp.: dwarf scrub, scrub, steppe-forest (*Artemisia santolinifolia*, *Pinus gerardiana*) / W Himalaya: Gilgit, Astor, Kashmir / W HIM / he.

[*Nepeta glutinosa* Benth.]

ASTOR: Ru: Chugam, *Giles 80* (Cat. Pak.).

Tian Shan, Pamir, N & E Afgh.; Baltistan, Ladakh, Zaskar / PAMIR / he.

Possibly identical with *N. adenophyta* (see above), but has also been recorded (s. str.) from Deosai and Skardu.

Nepeta govaniiana (Wall. ex Benth.) Benth. (*Dracocephalum govaniianum* Benth.)

ASTOR/KASHMIR: Kamri P., 3800 m, 1892-08-26, *Duthie* (E, Fl. Pak. 192).

3800 m / subalp. / W Himalaya: Hazara – NW India / W HIM / he.

Nepeta hindostana (Roth) Haines (*Glechoma hindostana* Roth, *N. calaminthoides* Royle ex Benth., *N. ruderalis* Ham.)

CHILAS: Go: Darang >, 1550 m, *Dickoré 12674* (!); Gor, 2420 m, *Dickoré 12654* (!); Gor > NW, 2600 m, *Dickoré 12542* (!); Gor, Martal <, 2650 m, *Nüsser 1172* (B!). – Bu: Muthat –

Raikot Bridge, 2000 m, *Nüsser 1060* (B!).

1550-2650 m / coll.-submont.: scrub, semi-desert, steppe-forest (*Heliotropium dasycarpum*, *Pinus gerardiana*, *Quercus*, *Stipagrostis plumosa*) / W Himalaya: Afgh. – W Nepal / W HIM / he.

Nepeta kokanica Regel (? *N. pamirensis* Franch., *N. pamiralaica* Lipsky, *N. supina* sensu Hook. f., non Steven)

CHILAS: Babusar P., 4200 m, *Swed. Exp. A-6143* (GB, Fl. Pak. 192); 4000-4200 m, *Miehe 578* (! det. Hedge). – Pa: Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser 1367* (B!); Pattaro Valley, Guttum Sagar – Kosto Gali, 4720 m, *Nüsser 1395* (B!). – Ra: Raikot Gl., nunatak, BC, 4400 m, *Nüsser 498* (B!). — ASTOR: As: Sango Sar, *Giles 589* (K, Fl. Pak. 192); 4200 m, *Swed. Exp. A-6438* (GB, Fl. Pak. 192). – Ru: Toshain Valley, moraine, 4700 m, *Nüsser 1522* (B!). 4000-4720 m / alp.-subniv. / Tian Shan, Pamir, Afgh., SW Karakorum, W Himalaya: Chitral – Kashmir / PAMIR / he.

Nepeta laevigata (D. Don) Handel-Mazz. (*Betonica laevigata* D. Don, *N. spicata* Benth.)

CHILAS: Babusar Valley, Jal – Nagat, 2050 m, *Dickoré 12825* (!). 2050 m / submont.: flush, meadow / Pamir, Himalaya: Afgh., Kashmir – Nepal, China / HIMAL / he.

Nepeta leucolaena Benth. ex Hook. f. / gasmalli, jungeli (sh)

CHILAS: Go: Gor, 2690 m, *Schickhoff 1595* (!); 2940 m (*Dickoré*); Gor > NW, 2600 m, *Dickoré 12543* (!); 2770 m, *Dickoré 12594* (!); Gor, Martal <, 2780 m, *Nüsser 1163* (B!). – Ra: Raikot Gl., right lateral moraine, 3420 m, *Nüsser 312* (B!). — ASTOR: *Schlagintweit 6916* (E, Fl. Pak. 192). – Da: Astor – Dashkin, *Giles 194* (Cat. Pak.). – As: Chongra – Shushong, 2200 m, *Hansen 215* (!); Gurikot – Das Kirim, *R. R. Stewart 22976* (Cat. Pak.); Gurikot >, *R. R. Stewart* (Cat. Pak.). 2200-3420 m / submont.-subalp.: roadside, steppe-forest (*Pinus gerardiana*, *Quercus*) / SW Karakorum, Ladakh, W Himalaya: Astor, Kashmir – NW India / W HIM / ch.

Nepeta linearis Royle ex Benth.

CHILAS: Ra: Raikot Gl., nunatak, 3880 m, *Nüsser 437* (B!, cf.); 4040 m, *Nüsser 412* (B!, cf.). — ASTOR: As: Sango Sar, *Giles 584* (Cat. Pak.). 3880-4040 m / subalp.-alp.: scrub / W Himalaya: Hazara, Kashmir, NW India / W HIM / he. Closely related to *N. connata*.

Nepeta nervosa Royle ex Benth. / gulbar (sh)

ASTOR: Ka: Kalapani, 3050 m, *Schickhoff 1260* (!); 3400 m, *Hansen 95* (!). — ASTOR/DEOSAI: Burzil, 4100 m, *R. R. Stewart 22095* (Cat. Pak., Fl. Pak. 192). 3050-4100 m / mont.-alp. / W Himalaya: Chitral, Gilgit, Astor, Kashmir – NW India / W HIM / he.

● ***Ocimum basilicum*** L. / gasmalli, desi (sh), nyazbo, niazpu (u) / Basil (e)

ASTOR: As: Chongra Bazar, 2400 m, *Hansen 214* (!). 2400 m / submont. / cultivated (Africa, Asia, America) / th.

Perovskia abrotanoides Kar. (*P. artemisioides* Boiss.)

CHILAS: Go: Gor, 2300 m, *Schickhoff 1596* (!). – Ra: Tato, 2400 m, *Troll 7829*; Tato – Raikot Bridge, left slope, 2520 m, *Nüsser 562* (B!).

2300-2520 m / submont.: roadside / E Iran, Tian Shan, Pamir, Afgh., Baluch., S Karakorum, W Himalaya / PAMIR / ch.

Medicinal; rare on SE limit of distribution.

Phlomis bracteosa Royle ex Benth. (*P. lamiifolia* Royle)

CHILAS: Babusar P. N, 3400 m (*Dickoré*); Babusar Valley, 3950 m, *M. A. Siddiqi & Y. Nasir 2746* (RAW, Fl. Pak. 192). – Ra: Raikot Valley, Nunatak, 3900 m, *Troll 7776* (“*Phlomis*”).

— ASTOR: (Cat. Pak.). – Ka: Faqirkot – Chuno, 3800 m, *Hansen 170* (!); Kalapani – Kamri P., 3500-4000 m, *Troll 8057*.

3400-4000 m / subalp.-alp. / E Afgh. – Nepal / W HIM / he.

Phlomis spectabilis Falc. ex Benth. / gar (u)

ASTOR: Ka: Kalapani, *R. R. Stewart* (Cat. Pak.).

Himalaya: E Afgh. – Bhutan / HIMAL / he.

Prunella vulgaris L. / kalaveuth, self-heal (u), Selfheal (e)

ASTOR: (Cat. Pak.). – As: Astor Bazar, 2400 m, *Troll 7926*. – Ru: Rupal Valley, Bayals, 3160 m, *Nüsser 583* (B!); village Lower Rupal, 3100 m, *Nüsser 1599* (B!).

2400-3160 m / submont.-mont. / N Africa, Europe, Asia, N America (widely naturalised) / CIRC POL / he.

Salvia hians Royle ex Benth.

ASTOR/KASHMIR: Kamri, *Giles 685* (Cat. Pak., Fl. Pak. 192); Kamri P., 4000 m, *Troll 8066*.

4000 m / alp. / W Himalaya: Kashmir – Nepal / W HIM / he.

Salvia nubicola Wall. ex Sweet (*S. glutinosa* auct., non L.) / phta (sh), kharnar (u)

CHILAS: Pa: Pattaro Valley, 2500-3500 m, *Troll 7703*. — ASTOR: Da: Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 247* (B!); Mushkin RH > SE, 2720 m, *Dickoré 12773* (!). – As:

Bulashbar Bridge, 2420 m, *Nüsser 814* (B!, cf.); Chillam, *M. A. Siddiqi & Y. Nasir 4219* (K, RAW, Fl. Pak. 192). – Ru: Tarishing, 3010 m (Kazmi & Siddiqui 1953).

2420-3500 m / submont.-subalp.: forest (*Pinus wallichiana*) / Himalaya: E Afgh. – Bhutan / W HIM / he.

Scutellaria prostrata Jacquem. ex Benth.

CHILAS: Bu: Lichar Valley, 3000-3500 m, *Troll 7577*. — ASTOR: Ka: Rattu, *R. R. Stewart* (RAW, Fl. Pak. 192); Shankargarh, *Giles 658* (Cat. Pak.).

3000-3500 m / mont.-subalp. / SW Karakorum, W Himalaya: Chitral – Nepal / W HIM / he.

Stachys emodi Hedge (*S. sericea* Wall. ex Benth., non Cav.)

CHILAS: Bu: Buldar Valley, 3000 m, *Troll 7601*. — ASTOR: (Cat. Pak.). – Ru: Chugam – Rattu, 2600 m, *Troll 7941*. – Ka: Kalapani Valley, 3200 m, *Troll 7994*.

2600-3200 m / submont.-mont. / W Himalaya: Afgh. – Bhutan / W HIM / he.

Stachys tibetica Vatke

CHILAS: Ra: Pungadori – Tato, 2580 m, *Nüsser 560* (B!). — ASTOR: As: Gurikot, *R. R. Stewart 22963* (Cat. Pak.); Gurikot – Bulashbar, 2400 m, *Troll 7371*.

2400-2580 m / submont.: forest (*Picea*) / S Karakorum, W Himalaya: Gilgit, Ladakh, Kashmir / W HIM / he.

Apparently more common in S Karakorum and Ladakh.

Thymus linearis Benth. / tomorrow, tumuro (sh)

CHILAS: Go: Gor, 2690 m, *Schickhoff 1574* (!); 2940 m (*Dickoré*); 3230 m (*Schickhoff 1549*); 3520 m, *Schickhoff 1497* (!); Gor, Chamuri, 2800-3500 m, *Troll 7139*; Gor, Martal, 2970 m, *Nüsser 1141* (B!). — Ra: Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 331* (B!).

— ASTOR: Da: Harchu Valley, Baro Nirril >, 3220 m, *Nüsser 869* (B!); Mushkin Forest, 2580 m, *Schickhoff 1126* (!); 2900 m, *Schickhoff 1393* (!); 3000 m (*Schickhoff 1448*); Mushkin Forest, RH – Dashkin, 2660 m, *Nüsser 267* (B!). — As: Astor – Rama, *S. Omer 343* (KUH, Fl. Pak. 192). — Ru: Bazhin Lake, 3530 m, *Nüsser 10* (B!); Rupal Ridge, 3500 m, *Nüsser 133* (B!); Rupal Valley, 3800 m, *Peer 18* (!); Rupal Valley, Nagachakali, nunatak, 3500 m, *Nüsser 632* (B!); 3620 m, *Nüsser 608* (B!); 3710 m, *Nüsser 621* (B!); upper Mazeno BC, 4320 m, *Nüsser 1476* (B!). — Ka: Faqirkot, 3000 m, *Hansen 64* (!).

2580-4320 m / submont.-alp.: forest, scrub, steppe-forest, turf (*Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / Himalaya: Afgh. – Nepal, S Tibet / HIMAL / ch.

Leguminosae* (Papilionaceae)**Argyrolobium roseum*** (Cambess.) Jaub. & Spach

CHILAS: Go: Bunji – Thelichi, 1300 m, *Troll 7193*. — ASTOR: Da: Ramghat, 1200-1800 m, *Troll 7082*.

1200-1800 m / coll. / SW Asia, W Himalaya: Afgh. – Nepal / IRAN / he.

Astragalus bicuspis Fisch.

CHILAS: Go: Gor, 2650-2940 m (*Dickoré*); Gor > NW, 2600 m, *Dickoré 12573* (!); 2600 m, *Dickoré 12564* (!); 2600 m, *Dickoré 12576* (!); 2600 m, *Dickoré 12556* (!). — ASTOR: 2310 m, *Giles* (K, Fl. Pak. 100). — Da: Astor – Bunji, 1210-2130 m, 1954-05-28, *F. Schmid* (RAW, Fl. Pak. 100); 1300-2300 m, *F. Schmid 1812* (E, G, Deml 1971). — As: Astor Bazar, 2400 m, *Troll 7925*; Chongra, 2500 m, *Troll 7314*; Das Kirim, *Winterbottom 686a* (K, Fl. Pak. 100); Gudai, 1847-07-02, *Winterbottom 686* (K, Deml 1971); Gudai Valley, 2740-3040 m, *Duthie 12229* (BM, E, Fl. Pak. 100); Rama – Gurikot, 2430-2740 m, *R. R. & I. D. Stewart 22942a* (K, Fl. Pak. 100). — Ka: Rattu, *R. R. & I. D. Stewart 18816* (RAW, Fl. Pak. 100); *R. R. & I. D. Stewart 22807a* (RAW, Fl. Pak. 100).

1210-3040 m / coll.-mont.: steppe-forest (*Pinus gerardiana*, *Quercus*) / W Himalaya: Gilgit, Astor, Lahul / W HIM / ch.

Astragalus candolleanus Royle ex Benth. (*A. anomalus* Bunge, *A. royleanus* Bunge, *A. rhizanthus* subsp. *candolleanus* (Royle ex Benth.) Podlech) / haputch, hapucho (sh)

CHILAS: Babusar Valley, 3200 m, *Schickhoff 1717* (!, cf.). — Go: Gor, 3520 m, *Schickhoff 1510* (!, cf.); Gor, Kahlmimay <, 3520 m, *Nüsser 1120* (B!); Gor, Martal, 2970 m, *Nüsser 1139* (B!). — Pa: Diamir Valley, 2970 m, *Schickhoff 2428* (!, cf.). — Ra: Raikot Gl. – Ganalo

Gl. confluence, 3900 m, *Nüsser 286* (B!). — ASTOR: Da: Harchu Valley, Baro Nirril >, 3220 m, *Nüsser 865* (B!); Mushkin Forest, 2580 m, *Schickhoff 1122* (!, cf.); 2900 m, *Schickhoff 1397* (!, cf.); 3000 m, *Schickhoff 1421* (!, cf.); Mushkin RH <, 2580 m, *Dickoré 12726* (!). — As: Chongra, Gannu, 2600 m, *Hansen 127* (!). — Ru: Rupal Valley, Bayals – Chungphare, 3150 m, *Nüsser 798* (B!). — Ka: Kalapani Valley, 3300 m, *Troll 8045*. — ASTOR/KASHMIR: Gures [Gurais] P. N of Kashmir, *Winterbottom 520* (K, cf., *A. malacophyllus*, Fl. Pak. 100); Kamri P., 3350-3960 m, *Giles 708* (K, Fl. Pak. 100). — ASTOR/DEOSAI: Burzil P., 3440 m, *C. B. Clarke 29723* (K, Fl. Pak. 100, Podlech 1988). 2580-3960 m / submont.-alp.: forest, meadow, scrub, steppe-forest (*Pinus wallichiana*, *Salix wallichiana*) / W Himalaya: Chitral – Nepal / W HIM / ch.

***Astragalus coluteocarpus* Boiss.**

ASTOR: As: Dumusar Valley, 3300 m, *Troll 7528*. — Ka: Rattu, 2740 m, *R. R. & I. D. Stewart 18821* (K, “var. *coluteocarpus*”, Fl. Pak. 100). 2740-3300 m / mont. / W Himalaya: E Afgh. – NW India / W HIM / he.

***Astragalus concretus* Benth. (*A. isabellae* Dunn, *A. vicioides* Graham ex Baker)**

ASTOR: Ka: Kalapani – Kamri P., 3700 m, *Troll 8070* (“*A. isabellae*”). 3700 m / subalp. / W Himalaya: Kashmir – Nepal / W HIM / he.

[*Astragalus erionotus* Benth. ex Bunge]

ASTOR: (Cat. Pak.).

NE Afgh., NW Pakistan: Chitral, Swat.

Doubtful, there seems to be no confirmed record E of Chitral, Swat (cf. Podlech 1988).

***Astragalus falconeri* Bunge**

CHILAS: Bu: Muthat, 2800 m, *Troll 7591*. — ASTOR: *Winterbottom* (K, Fl. Pak. 100). — As: Gudai, 2740 m, *R. R. Stewart 18945* (K, RAW, Fl. Pak. 100). — Ru: Tarishing, 2590 m, *R. R. Stewart 20839* (K, Fl. Pak. 100).

2590-2800 m / submont.-mont. / SW Karakorum, NW Himalaya: Chitral, Gilgit, Astor, Baltistan / ENDEM / he.

***Astragalus grahamianus* Royle ex Benth. (*A. cicerifolius* Royle ex Fisch., *A. daltonianus* Bunge, *A. polyacanthus* sensu Baker, non Royle ex Benth., *A. scariosus* Benth. ex Bunge)**

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1750* (!). — Go: Gor, 2690 m, *Schickhoff 1566* (!, cf.). — ASTOR: Da: Doian <, 1680 m, *Nüsser 718* (B!); Ramghat, 1200-1800 m, *Troll 7051* (“*A. polyacanthus*”). — Ka: Rattu, 2700 m, *Troll 7969* (“*A. polyacanthus*”).

1200-2750 m / coll.-mont.: forest, steppe-forest (*Cedrus*, *Pinus gerardiana*) / SW Karakorum, W Himalaya: Gilgit, Swat – Kashmir, Lahul / W HIM / ch.

***Astragalus graveolens* Buch.-Ham. ex Benth.**

ASTOR: Da: Astor – Bunji, 1954-05-28, *F. Schmid* (RAW, Fl. Pak. 100); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 227* (B!).

2700 m / mont.: forest (*Cedrus*) / Himalaya: Afgh. – SW China / HIMAL / he.

***Astragalus himalayanus* Klotzsch & Garcke (*A. carinalis* Benth. ex Bunge)**

ASTOR/DEOSAI: Burzil Chowki – Deosai, *R. R. Stewart 19994* (RAW, Fl. Pak. 100).
W Himalaya: Kashmir – Nepal / W HIM / he.

***Astragalus maddenianus* Benth. ex Baker**

ASTOR: As: Rama Valley, near Kareyabe, 3700 m, *Nüsser 190* (B!). – Ru: Rupal Valley, Nagachakali, nunatak, 3440 m, *Nüsser 603* (B!, cf.). — ASTOR/DEOSAI: Burzil (Cat. Pak.).
3440-3700 m / subalp.: moraine, turf / W Himalaya: Hazara – Uttar Pradesh / W HIM / he.

***Astragalus maxwellii* Royle ex Benth. (*A. ciliolatus* Benth. ex Bunge)**

ASTOR: Da: Doian, 2700-3000 m, *Troll 7209* (“*A. ciliolatus*”). – Ka: Kalapani Valley, 3300 m, *Troll 8042* (“*A. ciliolatus*”).
2700-3300 m / mont. / Astor, Kashmir / ENDEM / he.

***Astragalus melanostachys* Benth. ex Bunge (*A. macrostegius* Rech. f.)**

CHILAS: Ra: Kosto Valley, 3800 m, *Nüsser 1454* (B!); Raikot Gl., 3700 m, *Troll 7622*; Raikot Gl., nunatak, 4120 m, *Nüsser 373* (B!); 4120 m, *Nüsser 372* (B!); 4270 m, *Nüsser 392* (B!); Raikot Valley, Bayal, 3600 m, *Nüsser 1277* (B!). — ASTOR: Ru: Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1542* (B!).
3600-4270 m / subalp.-alp.: boulder slope, meadow, scree / Pamir, Karakorum, Himalaya, S Tibet / TIBET / he.

[*Astragalus nivalis* Kar. & Kir. (*A. thomsonianus* Benth. ex Bunge)]

ASTOR: Ru: Tap Gl. right lateral moraine, 3590 m, *Nüsser 735* (B!, cf.).
3590 m / subalp. / Pamir, Karakorum, W Himalaya / PAMIR / ch.
A vegetative specimen only.

***Astragalus oxyodon* Baker**

ASTOR/DEOSAI: Beyond Burzil P., *Winterbottom* (K, Fl. Pak. 100).
W Himalaya: Kashmir, NW India / W HIM / he.

***Astragalus peduncularis* Royle ex Benth.**

CHILAS: Go: Gor, Martal, 2930 m, *Nüsser 1071* (B!). – Pa: Diamir Valley, 2970 m, *Schickhoff 2417* (!, cf.). – Bu: Muthat, 2960 m, *Nüsser 1036* (B!). — ASTOR: (Cat. Pak.). – Da: Harchu Valley, Karmi Haray, 2740 m, *Nüsser 831* (B!, cf.); Mushkin Forest, 2580 m, *Schickhoff 1127* (!, cf.); 2740-3040 m, *Duthie 12271* (K, Fl. Pak. 100); Mushkin RH > SE, 2700 m, *Dickoré 12772* (!). – As: Rattu – Gurikot, 2500-2800 m, *F. Schmid 1786* (G, Fl. Pak. 100). – Ru: Rupal Valley, 2430 m, *R. R. Stewart 22842* (K, Fl. Pak. 100).
2430-3040 m / submont.-mont.: forest, hay meadow (*Pinus wallichiana*) / Tian Shan, Pamir, W Himalaya / PAMIR / he.

[*Astragalus psilocentros* Fisch. & C. A. Mey.]

CHILAS: Go: Gor Gali, 2700 m, *Troll 7113*.
2700 m / mont.

A species of Baluch. and Punjab (cf. Deml 1971), the record may refer to *A. grahamianus*.

***Astragalus rhizanthus* Royle ex Benth. (*A. hindukushensis* Wendelbo)**

CHILAS: Go: Gor, 3230 m, *Schickhoff 1537* (!, cf.); 3520 m, *Schickhoff 1475* (!). – Ra: Bezar Gali E, Sagar, 3750 m, *Nüsser 537* (B!); Raikot Gl., nunatak, BC, 3850 m, *Nüsser 1307* (B!); Raikot Valley, 3220 m, *Schickhoff 1660* (!); 3230 m, *Schickhoff 1628* (!); Raikot Valley, Bayal, 3600 m, *Nüsser 1275* (B!); Raikot Valley, Jut, 3310 m, *Nüsser 945* (B!); 3330 m, *Nüsser 935* (B!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 316* (B!); Raikot Valley, right slope, 3660 m, *Nüsser 992* (B!). — ASTOR: (Cat. Pak.). – Da: Harchu Valley, 3500 m, *Nüsser 850* (B!). – As: Astor – Rama, 2740-3040 m, *R. R. Stewart 22876* (K, Fl. Pak. 100); 2750-3050 m, *R. R. Stewart 22876* (K, Podlech 1988); Rama, 3350 m, *E. Nasir & Webster 6469* (G, K, M, RAW, W, Podlech 1988); Rama Valley, 3170 m, *Lankester & Pearson 1213* (BM, Podlech 1988); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1014* (!, cf.); Rattu – Gurikot, 2500-2800 m, *F. Schmid 1767* (BM, RAW, Podlech 1988). – Ru: Bazhin Lake, 3520 m, *Nüsser 3* (B!); Rupal Valley, 3600 m, *Peer* (!); Rattu – Rupal Valley, 2600 m, *R. R. Stewart 18853* (BM, Podlech 1988); Tarishang, 2600-2900 m, *Troll 7382* (“*A. exscapus*”); Tarishang nr., 2450-2750 m, *R. R. Stewart 22829* (K, Podlech 1988); upper Mazeno BC, 4320 m, *Nüsser 1465* (B!); upper Rupal Valley, 3600 m, *Troll 7468*. Zaipur >, 3140 m, *Schickhoff 1092* (!, cf.). – Ka: Rattu >, 2750 m, *R. R. Stewart 22786 a* (K, Podlech 1988); Shankargarh – Rattu, *R. R. & I. D. Stewart 22786* (RAW, Fl. Pak. 100).

2450-4320 m / submont.-alp.: forest, meadow, scrub (*Abies*, *Picea*, *Pinus wallichiana*) / W Himalaya: E Afgh. – Uttar Pradesh / W HIM / he.

Contrary to the opinion of Podlech (1988), *A. rhizanthus* and *A. candolleanus* are considered specifically distinct here, though the determination of the specimens may not always be accurate.

***Astragalus strobiliferus* Royle ex Benth. / haputch (sh), kon (u)**

CHILAS: Go: Gor, 2400 m, *Dickoré 12531* (!). – Ra: Jalipur, 1200 m, *Troll 7176*. — ASTOR: Da: Dashkin, 2300 m (*Dickoré*); Doian, 2650 m (*Dickoré*); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 242* (B!). – As: 2430-3960 m (Kazmi & Siddiqui 1953); Gudai (Kazmi & Siddiqui 1953); Gurikot, 2400 m, *Troll 7557*. – Ru: Rupal Valley, 3300 m, *Nüsser 115* (B!, cf.).

1200-3960 m / coll.-mont.: dwarf scrub, steppe-forest (*Artemisia brevifolia*, *Quercus*) / Afgh., Baluch., W Himalaya: Chitral – Astor / IRAN / ch.

Medicinal (tragacanth gum).

***Astragalus subuliformis* DC. (*A. subulatus* Pallas, non Desf.)**

ASTOR: Da: Doian, 2500-3000 m, *Troll 7226*.

2500-3000 m / submont.-mont. / SW Asia: Turkey – Baluch., Kashmir, Ladakh / IRAN / he.

[*Astragalus subumbellatus* Klotzsch & Garcke (*A. camporum* Benth. ex Boiss., *A. hippocrepidis* Benth. ex Bunge)]

ASTOR: Da: Mushkin, 1900 m, *Troll 7254* (“*A. hippocrepidis*”). – As: Rama Valley, 3000 m, *Troll 7310*.

1900-3000 m / coll.-mont. / Afgh., Pakistan / IRAN / he.

Identity uncertain.

Astragalus tecti-mundi Freyn (*A. frigidus* auct., non (L.) A. Gray)

CHILAS: Ra: Raikot Gl., nunatak, 4040 m, *Nüsser 413* (B!, cf.); Raikot Valley, Ganalo Gl., 4000 m, *Troll 7716* (“*A. frigidus*”). — ASTOR: (“*A. frigidus*”, Cat. Pak.). — As: Rama >, 3350 m, *R. R. Stewart 22906* (K, “*A. frigidus*”, Fl. Pak. 100). — Ru: Chichi Valley, 3200 m, *Troll 7489* (“*A. frigidus*”); Latobo S, 4270 m, *Nüsser 84* (B!); Latobo, Tap Gl., left lateral moraine, 3660 m, *Nüsser 35* (B!); Zaipur >, 3140 m, *Schickhoff 1107* (!).

3140-4270 m / mont.-alp.: forest (*Pinus wallichiana*) / Pamir, SW Karakorum, W Himalaya / PAMIR / he.

Close to the Euro-Siberian *A. frigidus* and often included into, but a more robust plant with larger flowers.

[*Astragalus tribulifolius* Benth. ex Bunge]

ASTOR: (Cat. Pak.).

Ladakh, Tibet, W China (Gansu, Sichuan) / TIBET / he.

Doubtful identification; apparently known only from Rupshu eastwards.

[*Astragalus webbianus* Graham ex Benth.]

ASTOR: (Cat. Pak.).

Doubtful, no confirmed record in Podlech (1988), possibly confused with subglabrous forms of *A. rhizanthus*. Several records, however, from Wakhan/Chitral, Karakorum, and Lahul. A plant of alpine granite scree.

Astragalus zanskarensis Benth. ex Bunge (*A. cicerifolius* Royle ex Bunge, non Royle ex Fisch., *A. oplites* Benth. ex Parker)

CHILAS: Go: Gor, Chamuri, 2900-3400 m, *Troll 7138*. — Ra: Raikot Valley, Nunatak, 3700-4200 m, *Troll 7780*. — ASTOR: Da: Doian, 2800-3000 m, *Troll 7203*. — As: Dumusar Valley, 3100 m, *Troll 7530*; Gudai, 2600 m, *Troll 7046*. — Ru: Village Lower Rupal, 3100 m, *Nüsser 1593* (B!). — Ka: Rattu, 3200 m, *Miehe 950301* (!).

2600-4200 m / submont.-alp. / S Karakorum, W Himalaya: Astor, Baltistan, Ladakh, Zaskar, Himachal Pradesh / W HIM / ch.

Caragana conferta Benth. ex Baker

CHILAS: Go: Gor, 3520 m, *Schickhoff 1470* (!); Gor > NW, 2850 m (*Dickoré*); 2900 m, *Dickoré 12619* (!); Gor, Kahlimay <, 3390 m, *Nüsser 1123* (B!). — ASTOR: As: Gudai Valley, 3350-3650 m, *Duthie 12196* (BM, E, K, Fl. Pak. 100).

2850-3650 m / mont.-subalp.: forest, scrub (*Picea*, *Pinus wallichiana*) / SW Karakorum, W Himalaya: Gilgit, Baltistan, Astor, Kashmir / W HIM / np.

A spiny shrub with bright green leaves.

Caragana tragacanthoides var. *himalaica* Kom.

CHILAS: Go: Gor, 2450 m, *Schickhoff 1465* (!); 2690 m, *Schickhoff 1577* (!); Gor > NW, 2830 m (*Dickoré*); Gor Gali, 2800 m, *Troll 7115*; Gor, Martal <, 2750 m, *Nüsser 1165* (B!). — ASTOR: Da: Hattu [?], 1847-08-03, *Winterbottom 911* (K, Fl. Pak. 100); Hattu Pir, 2740-3040 m, *Giles 220* (K, Fl. Pak. 100).

2450-3040 m / submont.-mont.: scrub, steppe-forest (*Pinus gerardiana*) / W Himalaya: Kashmir – Nepal / W HIM / np.
A very spiny shrub with grey, densely pubescent leaves.

Chesneya cuneata (Benth.) Ali (*Gueldenstaedtia cuneata* Benth., *Calophaca cuneata* (Benth.) Kom.)

CHILAS: Pa: Jiliper Valley, 2800 m, *Troll* 7667.

2800 m / mont. / SW Karakorum, W Himalaya: Chitral – Ladakh / W HIM / ge.

Chesneya depressa (Oliv.) Popov (*Calophaca depressa* Oliv.)

CHILAS: Go: Thelichi, 1260 m, *Dickoré* 12520 (!). — ASTOR: (Cat. Pak.). – Da: Astor – Bunji, 1400-2300 m, *F. Schmid* 1798 (G, Fl. Pak. 100); Bunji, 1300 m, *Troll* 7087.

1260-2300 m / coll.-submont.: semi-desert, sand / SW Karakorum, W Himalaya: Chitral – Astor / W HIM / he.

Cicer microphyllum Benth. (*C. songaricum* sensu Baker, non Steph.) / kueni, jungeli (sh)

CHILAS: Babusar Valley, 3200 m, *Schickhoff* 1694 (!). – Pa: Diamir Valley, 3150 m, *Schickhoff* 2441 (!). – Ra: Raikot Gl., nunatak, 3880 m, *Nüsser* 435 (B!); Raikot Gl., nunatak, BC, 3910 m, *Nüsser* 1297 (B!). – Bu: Muthat, 2960 m, *Nüsser* 1035 (B!). — ASTOR: (“*C. songaricum*”, Cat. Pak.). – Da: Harchu Valley, Baro Nirril >, 3230 m, *Nüsser* 881 (B!); Mushkin Forest, RH – Dashkin, 2690 m, *Nüsser* 278 (B!). – As: Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff* 1028 (!); 3220 m, *Schickhoff* 966 (!). – Ru: Latobo, Tap Gl., 4000 m, *Nüsser* 57 (B!); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser* 1558 (B!); Tarishing, 2600-2900 m, *Troll* 7381; Zaipur >, 3120 m, *Schickhoff* 1047 (!); 3140 m, *Schickhoff* 1088 (!). – Ka: Faqirkot, 2800 m, *Hansen* 33a (!); 2980 m, *Schickhoff* 1299 (!); 3220 m, *Schickhoff* 1343 (!). — ASTOR/DEOSAI: Burzil P., 3350-3650 m, 1939-08-27, *R. R. & I. D. Stewart* (K, Fl. Pak. 100).

2600-4000 m / submont.-alp.: forest, scree, scrub, steppe (*Abies*, *Cedrus*, *Picea*, *Pinus wallichiana*) / C. Asia, Karakorum, W Himalaya: Kashmir – W Nepal / C AS / he.

Colutea paulsenii Freyn / braa (u)

ASTOR: (Cat. Pak.). – Da: Doian <, 1660 m, *Nüsser* 713 (B!); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser* 231 (B!, cf.); Ramghat, 1200-1800 m, *Troll* 7062 (“*C. arborescens*”); Ramghat – Doian, 1660-2600 m (*Dickoré*). – As: 2430-3350 m (“*C. nepalensis*”, Kazmi & Siddiqui 1953); Gudai, 1847-07-02, *Winterbottom* (K, Fl. Pak. 100); Gurikot, 1901-07-06, *Duthie* 25566 (K, “subsp. *paulsenii*”, Fl. Pak. 100); 2370 m, *Giles* 55 (K, Fl. Pak. 100). – Ru: Churit – Bulashbar, 2480 m, *Nüsser* 808 (B!); Rupal – Gurikot, *R. R. & I. D. Stewart* 18905 (RAW, Fl. Pak. 100); Rupal Valley, 2590 m, *R. R. Stewart* 22866 (K, Fl. Pak. 100).

1200-3350 m / coll.-mont. / Pamir, S Karakorum, Astor, Kashmir / W HIM / np.

Medicinal. Most specimens may be referred to subsp. *mesantha* (Shap. ex Ali) Browicz, though differences to *C. nepalensis* remain obscure.

Glycyrrhiza glabra L. / mulahti (u)

ASTOR: Da: Doian (Kazmi & Siddiqui 1953).

Ruderal / S & E Europe, SW Asia / IRAN / he.
Medicinal.

Hedysarum cachemirianum Benth. ex Baker

ASTOR/KASHMIR: Gures [Gurais] P., 1847-06-21, *Winterbottom* (K, Fl. Pak. 100); Kamri P., 4000 m, *Troll 8059*. — ASTOR/DEOSAI: Burzil P., 1847-06-29, *Winterbottom* (K, Fl. Pak. 100). 4000 m / alp. / Astor, Kashmir / ENDEM / he.

Hedysarum falconeri Baker (*H. obscurum* var. *falconeri* (Baker) Fedtsch.) / halaskur, khating (sh)

CHILAS: Ra: Raikot Gl., left lateral moraine, 3400 m, *Nüsser 1455* (B!); Raikot Gl., right lateral moraine, 3380 m, *Nüsser 309* (B!, cf.); Raikot Valley, 3230 m, *Schickhoff 1623* (!, cf.); Tato – Fairy Meadows, 3060 m, *Nüsser 983* (B!). – Bu: Lichar Valley, 3000 m, *Troll 7579*. — ASTOR: 1901-07-05, *Inayat 25563* (K, Fl. Pak. 100). – Da: Harchu Valley, Baro Nirril >, 3220 m, *Nüsser 864* (B!). – As: Chongra, 2600 m, *Hansen 136b* (!, cf.); Gurikot – Bulashbar, 2400-2500 m, *Troll 7367*. – Ru: Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1560* (B!); Tap Gl., terminal moraine, 3590 m, *Nüsser 18* (B!). – Ka: Faqirkot, 2750 m, *Hansen 222* (!); Rattu, 2740 m, *R. R. Stewart 18824* (K, Fl. Pak. 100).

2400-3950 m / submont.-alp.: forest (*Pinus wallichiana*) / SW Karakorum, W Himalaya: E Afgh. – Kashmir / W HIM / he.

Indigofera heterantha Wall. ex Brandis

CHILAS: Go: Gor, 2160 m (*Dickoré*).

2160 m / submont. / Himalaya: Afgh. – SE Tibet, SW China / HIMAL / ch.
Very common in the Outer W Himalaya.

Lathyrus emodi (Wall. ex Fritsch) Ali (*Orobis emodi* Wall. ex Fritsch, *L. laevigatus* subsp. *emodi* (Wall. ex Fritsch) Ohashi, *L. luteus* auct., non (L.) Peterm.) / maraké (sh)

ASTOR: Ka: Faqirkot, *Hansen 221* (!); 2700 m, *Hansen 67* (!); Kalapani – Kamri P., 3700 m, *Troll 8069*; Shankargarh, 2890 m, *Giles 61* (K, Fl. Pak. 100).

2700-3700 m / mont.-subalp. / W Himalaya: Chitral – NW India / W HIM / he.

Lathyrus humilis Fisch. ex Spreng. (*L. altaicus* Ledeb.)

ASTOR/KASHMIR: Kamri P., 3350-3650 m, *Giles 36* (K, Fl. Pak. 100).

3350-3650 m / mont.-subalp. / W & C. & E Asia – W Himalaya: Chitral – NW India / C AS / he.

Lathyrus pratensis L. / Meadow Vetchling (e)

ASTOR: Ka: Rattu, 2700 m, *Troll 7981*.

2700 m / submont. / E Africa, Europe, Asia / EURAS / he.

● ***Lathyrus sativus*** L. / Indian Pea (e)

ASTOR: As: Gurikot, 2400 m, *Troll 7547*.

2400 m / submont. / cultivated / th.

● *Lens culinaris* Medik. (*Lens esculenta* Moench) / mozir (sh), Lentil (e)ASTOR: Ka: Fakirkot, 2700 m, *Hansen 192* (!).

2700 m / submont. / cultivated / th.

Lespedeza juncea (L. f.) Pers. (*Hedysarum junceum* L. f.)CHILAS: Go: Darang >, 1450 m, *Dickoré 12693* (!); Gor, 2400 m, *Dickoré 12537* (!).1450-2400 m / coll.-submont.: scrub, steppe-forest (*Quercus*) / Himalaya: Afgh. – China, SE Asia / HIMAL / ch.*Lotus corniculatus* L. (*L. corniculatus* subsp. *minor* Baker, *L. corniculatus* subsp. *tenuis* (Wald. & Kit. ex Willd.) Briq. & Rech. f., *L. tenuis* Wald. & Kit. ex Willd.) / Common Bird's-foot-trefoil (e)CHILAS: Go: Gor, Martal, 2930 m, *Nüsser 1078* (B!). — ASTOR: As: Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1011* (!). — Ru: Rupal Valley, 3300 m, *Nüsser 108* (B!). — Ka: Faqirkot, 3220 m, *Schickhoff 1367* (!).2930-3300 m / mont.: forest (*Abies*, *Pinus wallichiana*) / E Africa, Europe, Asia, Australia (introduced America) / EURAS / he.*Medicago lupulina* L. / Black Medic (e)ASTOR: Ru: Tarishing – Bayals, 3000 m, *Nüsser 789* (B!).

3000 m / mont.: irrigated meadow, ruderal / Africa, Europe, Asia (introduced Australia, America) / EURAS / he.

Medicago sativa subsp. *falcata* (L.) Arcang. (*M. falcata* L.) / rishka (sh), Sickle Medick (e)CHILAS: Go: Gor, Martal <, 2650 m, *Nüsser 1175* (B!). — ASTOR: Ru: Churit E, 2450 m, *Nüsser 1607* (B!); village Lower Rupal, 3100 m, *Nüsser 1587* (B!).

2450-3100 m / submont.-mont. / Europe, Asia / EURAS / he.

● *Medicago ×varia* Martyn (*M. falcata* × *sativa*, *M. ladak* Vass.) / ishpit, kaushet (sh), Lucerne (e)ASTOR: Da: Turbaling – Doian, 2570 m (*Dickoré*). — As: Nagam, *Hansen 199* (!); *Hansen 128* (!). — Ru: Rupal Valley, 3300 m, *Nüsser 111* (B!); Tarishing – Churit, 2830 m, *Nüsser 144* (B!); 2830 m, *Nüsser 146* (B!). — Ka: Faqirkot, 2800 m, *Hansen 35* (!).

2570-3300 m / mont. / cultivated / he.

Important winter fodder, locally naturalising.

Melilotus alba Desr. / nilatsot (sh), White Melilot (e)ASTOR: (Cat. Pak.). — Ka: Faqirkot, 2800 m, *Hansen 123* (!).

2800 m / mont. / Africa, Europe, Asia (introduced Australia, America) / EURAS / th.

Onobrychis laxiflora BakerCHILAS: Go: Gor, 2420 m, *Dickoré 12655* (!); Gor > NW, 2600 m, *Dickoré 12560* (!). —ASTOR: 1901-07-07, *Inayat* (K, “var. *schugnanica*”, Fl. Pak. 100). — Da: Ramghat, 1500 m, *Troll 7197*. — As: Gurikot, *Winterbottom* (K, Fl. Pak. 100); Gurikot, Partabgarh, 2800 m, *Troll 7334*. — Ru: Rattu – Rupal, *R. R. & I. D. Stewart 21813b* (RAW, “var. *schugnanica*”,

Fl. Pak. 100). – Ka: Rattu, 2740 m, *R. R. Stewart 18820* (RAW, “var. *schugnanica*”, Fl. Pak. 100); 2740 m, *R. R. Stewart 18835* (RAW, “var. *schugnanica*”, Fl. Pak. 100); Shankargarh, 1901-07-09, *Inayat* (K, “var. *laxiflora*”, Fl. Pak. 100); 1901-07-09, *Inayat* (K, “var. *schugnanica*”, Fl. Pak. 100).

1500-2800 m / coll.-mont.: scrub, steppe-forest (*Pinus gerardiana*, *Quercus*) / Pamir, Baluch., W Himalaya: Afgh. – SW Karakorum, Astor / PAMIR / he.

SE limit of distribution.

Ononis antiquorum L. (*O. spinosa* subsp. *antiquorum* (L.) Briq.)

CHILAS: Go: Gor, 2400 m, *Dickoré 12539* (!). — ASTOR: As: Sango Sar, 2280 m, *Giles 398* (K, Fl. Pak. 100).

2280-2400 m / submont.: steppe-forest (*Quercus*) / N Africa, E Europe, SW Asia: Turkey – Kashmir / IRAN / ch.

Oxytropis humifusa Kar. & Kir.

CHILAS: Babusar P., 4300 m, *Miehe 506* (!). – Go: Gor, Kahlmimay >, 3770 m, *Nüsser 1110* (B!).

3770-4300 m / subalp.-alp. / Tian Shan, Pamir, Karakorum, W Himalaya: Afgh. – NW India / PAMIR / he.

Oxytropis lapponica (Wahlenb.) Gay

CHILAS: Babusar P., 4050-4100 m, *Miehe 465* (!); 4300 m, *Miehe 471* (!); Babusar P. N, 3700 m, *Dickoré 12846* (!); Babusar P. NE, 4210 m, *Dickoré 12901* (!). – Go: Gor, Martal, 2970 m, *Nüsser 1149* (B!). – Pa: Pattaro Valley, 3900 m, *Troll 7694* (cf., “*O. coerulea*”). – Ra: Ganalo Gl., nunatak, BC, 4200 m, *Nüsser 516* (B!); Kosto Valley, 4300 m, *Nüsser 1420* (B!); Raikot Gl., left lateral moraine, 3700 m, *Nüsser 1313* (B!); Raikot Gl., nunatak, 3900 m, *Nüsser 421* (B!, cf.); 4210 m, *Nüsser 407* (B!); Raikot Gl., nunatak, BC, 3910 m, *Nüsser 1292* (B!); 3970 m, *Nüsser 469* (B!, cf.); 3970 m, *Nüsser 450* (B!, cf.); 3990 m, *Nüsser 462* (B!); 4000 m, *Troll 7752a* (cf., “*O. altaica*”). — ASTOR/SKARDU: Alampi P., 4260 m, *Duthie 12163* (BM, Fl. Pak. 100).

2970-4300 m / mont.-alp.: avalanche path, dwarf scrub, meadow, rock, scree, turf (*Juniperus*) / Europe, Asia, N America, S to W Himalaya / CIRCPOL / he.

Oxytropis mollis Royle ex Benth. (*O. thomsonii* Benth. ex Bunge)

ASTOR: Ru: Chichi Valley, 3000 m, *Troll 7498*. – Ka: Faqirkot, 2980 m, *Schickhoff 1303* (!); 3220 m, *Schickhoff 1359* (!); Kalapani, 3050 m, *Schickhoff 1280* (!); Kalapani Valley, 3300 m, *Troll 8041* (cf., “?*O. nutans*”). — ASTOR/DEOSAI: Burzil P., 3960 m, *Duthie 14040* (K, Fl. Pak. 100).

2980-3960 m / mont.-alp.: dwarf scrub, forest (*Abies*, *Artemisia santolinifolia*, *Cedrus*, *Pinus wallichiana*) / W Himalaya / W HIM / he.

Oxytropis tatarica Cambess.

ASTOR: Ru: Latobo, 3600 m, *Troll 7402*; Mazeno terminal moraine, 4300 m, *Peer 29* (!); Rupal Valley, lower Mazeno BC moraine, 4050 m, *Nüsser 1532* (B!); upper Mazeno BC, 4320 m, *Nüsser 1464* (B!).

3600-4320 m / subalp.-alp.: scree, turf (*Kobresia capillifolia*) / Pamir, Karakorum, Tibet, Inner Himalaya / TIBET / he.

● *Pisum sativum* L. / muttar (sh), Garden Pea (e)

CHILAS: Babusar Village, 2800 m (*Dickoré*).

2800 m / mont. / cultivated / th.

Sophora alopecuroides L.

CHILAS: Go: Gor, 2300 m, *Troll 7155*.

2300 m / submont. / SW & C. Asia, China / C AS / np.

Trifolium pratense L. / tchepati, chipati (sh), Red Clover (e)

ASTOR: (Cat. Pak.). – Ru: Rupal Valley, 3140 m, *Nüsser 126* (B!); 3300 m, *Nüsser 100* (B!); Rupal Valley, Bayals, 3160 m, *Nüsser 585* (B!); Tarishing, 2910 m, *Nüsser 576* (B!); Tarishing – Churit, 2830 m, *Nüsser 145* (B!); village Lower Rupal, 3100 m, *Nüsser 1579* (B!). 2830-3300 m / mont. / Europe, Asia (cultivated) / EURAS / he.

Trifolium repens L. / White Clover (e)

CHILAS: Go: Gor, 3230 m, *Schickhoff 1533* (!); Gor, Martal, 2970 m, *Nüsser 1153* (B!); Gor, Ranote, 2120 m, *Nüsser 1202* (B!). – Ra: Fairy Meadows, 3310 m, *Nüsser 362* (B!); 3310 m, *Nüsser 366* (B!); 3350 m, *Nüsser 957* (B!); Raikot Valley, Jut, 3310 m, *Nüsser 943* (B!); Raikot Valley, Pungadori, 3240 m, *Nüsser 914* (B!); 3290 m, *Nüsser 339* (B!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 320* (B!). — ASTOR: Da: Harchu Valley, 3350 m, *Nüsser 853* (B!); Mushkin RH > SE, 2700 m, *Dickoré 12770* (!). – As: Astor Bazar, Hotel, 2440 m, *Nüsser 900* (B!); 2440 m, *Dickoré 12815* (!); Rama Valley, 3180 m, *Nüsser 899* (B!); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1031* (!). – Ru: Bazhin Lake, 3520 m, *Nüsser 6* (B!); Latobo, 3600 m, *Nüsser 26* (B!); Tarishing, 2910 m, *Nüsser 783* (B!); village Lower Rupal, 3100 m, *Nüsser 1580* (B!). – Ka: Shankargarh, 2920 m, *Giles 64* (K, Fl. Pak. 100). 2120-3600 m / submont.-subalp.: forest, irrigated meadow, meadow, moist, ruderal (*Abies*, *Cedrus*, *Picea*, *Pinus wallichiana*) / N Africa, Europe, Asia (introduced America) / EURAS / he.

Trigonella cachemiriana Cambess. (*T. emodi* var. *medicagineae* Širj., *T. medicagineae* (Širj.) Vassilcz.)

CHILAS: Go: Gor, 3230 m, *Schickhoff 1535* (!). — ASTOR: Ru: Latobo, Tap Gl., left lateral moraine, 3660 m, *Nüsser 39* (B!). – Ka: Kalapani, 3040 m, *Giles 27* (K, Fl. Pak. 100); Kalapani – Kamri P., 3700 m, *Troll 8071*. — ASTOR/KASHMIR: Kamri Kotal [?], 3650 m, *Giles 99* (K, Fl. Pak. 100).

3040-3700 m / mont.-subalp.: forest (*Picea*, *Pinus wallichiana*) / Pamir, Afgh., W Himalaya: Chitral – NW India / W HIM / he.

Trigonella fimbriata Royle ex Benth. (*T. emodi* var. *fimbriata* (Royle ex Benth.) Širj.)

ASTOR: Ka: Kalapani, 3050 m, *Schickhoff 1257* (!).

3050 m / mont.: dwarf scrub (*Artemisia santolinifolia*) / W Himalaya: Kashmir – Nepal / W HIM / th.

Trigonella monantha subsp. ***incisa*** (Benth.) Ali (*T. incisa* Benth., *T. polycerata* sensu Baker, non L.)

CHILAS: Go: Darang, 1400 m, *Troll 7173*; Thelichi – Gor Gali, 2000 m, *Troll 7097*. —
ASTOR: Da: Mushkin, 1900 m, *Troll 7252*.
1400-2000 m / coll. / Afgh., Pakistan, NW India / IRAN / th.

Vicia benthamiana Ali (*V. mollis* Benth. ex Baker)

ASTOR: Ka: Kalapani >, 3040 m, *R. R. & I. D. Stewart 18703* (RAW, Fl. Pak. 100). —
ASTOR/DEOSAI: Burzil Chowki <, 2740-3040 m, *R. R. Stewart 19772* (RAW, Fl. Pak. 100);
Burzil P., 3350 m, 1939-08-27, *R. R. & I. D. Stewart* (RAW, Fl. Pak. 100).
2740-3350 m / mont. / NW Himalaya: Chitral, Astor, Kashmir / ENDEM / he.

● ***Vicia faba*** L. / bukak (sh), Broad Bean (e)

ASTOR: Ka: Rattu, 2740 m, *R. R. & I. D. Stewart 18826* (RAW, Fl. Pak. 100).
2740 m / mont. / cultivated / th.

Vicia sepium L. / Bush Vetch (e)

ASTOR: (Cat. Pak.).
Europe, Asia, W Himalaya: Swat – Kashmir / EURAS / he.

Vicia tenuifolia Roth / kukeni, jungeli (sh), Fine-leaved Vetch (e)

ASTOR: As: Chillam – Gudai, *E. Nasir & Webster 6416* (RAW, Fl. Pak. 100). – Ka:
Faqirkot, 2800 m, *Hansen 33* (!); Kalapani Valley, 2700-3000 m, *Troll 7985*; Rattu,
2740 m, *R. R. & I. D. Stewart 18827* (RAW, Fl. Pak. 100).
2700-3000 m / mont. / Europe, Asia, W Himalaya: E Afgh. – Kashmir / EURAS / he.

Linaceae

Linum perenne L. / Perennial Flax (e)

ASTOR: Ka: Rattu, *R. R. Stewart* (Cat. Pak.); 2800 m, *Troll 7979*.
2800 m / mont. / Europe, Asia / EURAS / he.

Loranthaceae

Arceuthobium minutissimum Hook. f.

ASTOR: As: Rama, 3300 m, *E. Nasir & Webster 6471* (RAW, Fl. Pak. 35).
3300 m / mont.: forest (*Pinus wallichiana*) / NW Himalaya / W HIM / ch.
A tiny parasite on *Pinus wallichiana*, locally causing great damage to the trees; outpost,
usually outer Himalaya.

Malvaceae

● ***Alcea lavateriflora*** (DC.) Boiss. (*Althaea lavateriflora* DC.) / White Hollyhock (e)

ASTOR: *R. R. Stewart 22948a* (Cat. Pak.).
Cultivated (SE Europe, SW Asia) / he.

● *Alcea rosea* L. / tchamna, chama (sh), Hollyhock (e)

CHILAS: Ra: Tato, 2400 m, *Troll 7804*. — ASTOR: Da: Dashkin, 2450 m, *Nüsser 283* (B!); 2450 m, *Nüsser 282* (B!); 2500 m, *Troll 7880* (“*Alcea*”); Doian, 1820 m (*Dickoré*). — As: Chongra – Toked, 2500 m, *Hansen 212* (!); Harchu – Astor, 2090 m (*Dickoré*).
1820-2500 m / coll.-submont.: cultivated, field (wheat), ruderal / cultivated (SE Europe, SW Asia) / he.

● *Malva mauritiana* L. (*Malva sylvestris* var. *mauritiana* (L.) Boiss.)

ASTOR: (Cat. Pak.).
N Africa, Europe, SW Asia / EURAS / he.
Occasionally cultivated as a vegetable.

Malva neglecta Wallr. (*M. rotundifolia* auct.) / shanie, tsotsol (sh), Dwarf Mallow (e)

CHILAS: Babusar Village, *S. Abedin & M. Qaiser 9049* (KUH, Fl. Pak. 130). — Go: Gor, 2420 m, *Dickoré 12666* (!); Gor, Ranote, 2120 m, *Nüsser 1191* (B!). — ASTOR: (Cat. Pak.). — Da: Mushkin Forest, RH – Dashkin, 2600 m, *Nüsser 262* (B!). — Ka: Faqirkot, 2800 m, *Hansen 108* (!).
2120-2800 m / submont.-mont.: forest, ruderal, scrub (*Cedrus*, *Quercus*) / Europe, Asia (introduced N America) / EURAS / he.

Malva verticillata L. (*M. chinensis* Mill.) / Curled Mallow (e)

CHILAS: Babusar < 10 miles, *S. Abedin & M. Qaiser 9136* (KUH, Fl. Pak. 130); Babusar < 12 miles, *S. Abedin & M. Qaiser 9050* (KUH, Fl. Pak. 130); Babusar < 3 miles, *S. Abedin & M. Qaiser 9153* (KUH, Fl. Pak. 130). — ASTOR: (Cat. Pak.).
China, probably introduced & cultivated N Africa, Europe, Asia / EURAS / he.
Cultivated as a vegetable, medicinal.

Moraceae*Ficus carica* L. / Fig (e)

CHILAS: Babusar Valley, 2050 m (*Dickoré*).
2050 m / submont. / SE Europe, SW Asia / IRAN / np.
Rare in Gilgit, possibly only cultivated and subspontaneous.

Ficus palmata subsp. *virgata* (Roxb.) Browicz / phak (sh), phagwara, anjir, patguleri (u)

CHILAS: Chilas – Babusar, 1330 m (*Dickoré*). — Go: Gor, 2160 m (*Dickoré*); 2300 m, *Troll 7159*; 2420 m, *Dickoré 12660* (!). — ASTOR: Da: Dashkin <, 1900 m, *Troll 7269*; Doian, 1700 m (*Dickoré*); Doian <, 1660 m, *Nüsser 709* (B!).
1330-2420 m / coll.-submont.: rock, semi-desert, scrub (*Quercus*) / Baluch., W Himalaya: Afgh. – Nepal (E Africa, SW Asia: *F. palmata* subsp. *palmata*) / W HIM / np.
Medicinal.

Morus alba L. / bidana shai maroch, maranu (sh), tut, tutri, tut kishmishmi (u)

CHILAS: Chilas – Babusar, 1330 m (*Dickoré*). — Go: Gor, 2160 m (*Dickoré*). — ASTOR: Da: Doian <, 1680 m, *Nüsser 719* (B!, cf.). — As: Astor (cultivated, Kazmi & Siddiqui 1953). — Ka: Faqirkot / Dirle P., 2850 m, *Hansen 81* (!, cf.).

1330-2850 m / coll.-mont.: steppe-forest, watercourse / SW Asia: Iraq – Pakistan (cultivated S, C. & E Asia) / IRAN / ph.

Cultivated as fruit tree and possibly wild, medicinal, and for feeding silk worms.

Morinaceae

Morina coulteriana Royle (*M. breviflora* Edgew.)

CHILAS: Bu: Lichar Valley, 3300 m, *Troll 7578*. — ASTOR: Ka: Kalapani, 3270 m, *M. B. Zaman 1979* (PPFI-B, Fl. Pak. 67); 3270 m, *M. B. Zaman 1977* (PPFI-B, Fl. Pak. 67); Kalapani Valley, 3200 m, *Troll 7993*. — ASTOR/DEOSAI: Burzil (Cat. Pak.).

3200-3300 m / mont.: meadow, scree / Pamir, SW Karakorum, W Himalaya: E Afgh. – Garhwal; SE Tibet / W HIM / he.

Nyctaginaceae

Boerhavia procumbens Banks ex Roxb. / itsit (u)

CHILAS: Chilas nr., *Peer 2* (!). – Go: Thelichi, 1260 m, *Dickoré 12514* (!).

1260 m / coll.: ruderal, semi-desert / S Asia, Pakistan, India / SUBTROP / he.
Medicinal.

Oleaceae

Fraxinus xanthoxyloides (Wall. ex G. Don) DC. (*Ornus xanthoxyloides* G. Don) / kasanur (sh), hanuz (u)

CHILAS: Go: Gor, Terimal, 2500 m, *Troll 7120*. – Pa: Diamir Valley, 1550 m, *Schickhoff 2612* (!). – Ra: Raikot Valley, 2300 m, *Schickhoff 1597* (!); Tato – Raikot Bridge, left slope, 2100 m, *Nüsser 565* (B!); 2210 m, *Nüsser 563* (B!). – Bu: Muthat – Raikot Bridge, 2350 m, *Nüsser 1046* (B!). — ASTOR: (Cat. Pak.). – Da: Astor <, opp. Parishing Gah, 2300 m, *Dickoré 12817* (!); Dashkin – Astor, 2220 m (*Dickoré*); Doian, 1820-2650 m (*Dickoré*); Mushkin, 1900 m, *Troll 7258*; Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 237* (B!). – Ru: Churit – Bulashbar, 2480 m, *Nüsser 802* (B!); Rupal – Gurikot, *E. Nasir & Webster 6503* (RAW, Fl. Pak. 59); 2430 m, *R. R. & I. D. Stewart 18899* (RAW, Fl. Pak. 59); 2430 m, *R. R. & I. D. Stewart 21861* (RAW, Fl. Pak. 59).

1550-2700 m / coll.-mont.: roadside, scrub, steppe-forest (*Fraxinus xanthoxyloides*) / Afgh., Baluch., SW Karakorum, W Himalaya / W HIM / ph.

Valuable hard wood, foliage used as fodder.

Olea ferruginea Royle (*O. cuspidata* Wall. ex G. Don) / kao (u), Indian Olive (e)

CHILAS: Go: Gor, 1850 m, *Schickhoff 1462* (!); 1930 m (*Dickoré*); Gor – Darang, 1700-1900 m, *Troll 7163*; Gor, Hapareng, 1950 m, *Nüsser 1206* (B!); Thelichi – Gor Gali, 2000 m, *Troll 7096*. – Ra: Tato – Raikot Bridge, left slope, 2080 m, *Nüsser 567* (B!). – Bu: Muthat – Raikot Bridge, 2100 m, *Nüsser 1058* (B!).

1700-2100 m / coll.-submont.: steppe (*Artemisia fragrans*) / W Himalaya: Afgh. – Himachal Pradesh / W HIM / ph.

Useful hard wood.

Onagraceae

Circaea alpina subsp. ***imaicola*** (Asch. & Magn.) Kitam. (*C. alpina* var. *himalaica* C. B. Clarke, *C. pricei* Hayata) / Alpine Enchanter's-Mightshade (e)

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12636* (!). — ASTOR: (“*C. pricei*”, Cat. Pak.). – Da: Doian >, *Duthie 12474* (E, Fl. Pak. 139); Mushkin RH <, 2580 m, *Dickoré 12730* (!); Mushkin RH > SE, 2700 m, *Dickoré 12760* (!); Turbaling, 2700 m, *Troll 7887* (“*C. alpina*”). – Ru: Rupal Valley, *R. R. Stewart 22852* (NY, Fl. Pak. 139).

2580-2950 m / submont.-mont.: forest, moist, rock (*Picea*, *Pinus wallichiana*, *Salix wallichiana*) / Himalaya: E Afgh. – SE Tibet, China (*Circaea alpina* subsp. *alpina*: temp. N hemisphere) / HIMAL / ge.

Epilobium amurense subsp. ***laetum*** (Wall. ex Hausskn.) Raven (*E. laetum* Wall. ex Hausskn., *E. tetragonum* sensu C. B. Clarke)

CHILAS: Babusar Valley, Jal – Nagat, 2050 m, *Dickoré 12822* (!).

2050 m / submont.: flush, meadow / Himalaya: Kashmir – Bhutan, SW China / HIMAL / he.

Epilobium angustifolium L. (*Chamaenerion angustifolium* (L.) Scop.) / doney (sh), Rosebay Willowherb, Fireweed (e)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2850* (RAW, Fl. Pak. 139); Babusar Valley, 3200 m, *Schickhoff 1714* (!). – Ra: Raikot Gl., left lateral moraine, 3400 m, *Nüsser 1456* (B!); Raikot Valley, 3220 m, *Schickhoff 1657* (!); 3230 m, *Schickhoff 1606* (!); 3560 m, *Schickhoff 1643* (!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 324* (B!). – Bu: Lichar Valley, 3200 m, *Troll 7576*. — ASTOR: Da: Harchu Valley, Baro Nirril >, 3230 m, *Nüsser 882* (B!); Mushkin Forest, 2900 m, *Schickhoff 1383* (!); 3000 m (*Schickhoff 1416*); 3000 m, *Schickhoff 1433* (!); Mushkin Forest, RH – Dashkin, 2660 m, *Nüsser 264* (B!). – As: Das – Astor, 1856-09-18/20, *Schlagintweit* (BM, Fl. Pak. 139); Rama, 1969, *M.S. Charma* (KUH, Fl. Pak. 139); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1024* (!); 3380 m, *Schickhoff 986* (!). – Ru: Tashing [Tarishing], 1856-09-16/24, *Schlagintweit* (BM, Fl. Pak. 139); Zaiपुर >, 3120 m, *Schickhoff 1069* (!). – Ka: Faqirkot, 2980 m, *Schickhoff 1336* (!); 3220 m, *Schickhoff 1357* (!).

2660-3960 m / submont.-alp.: forest (*Abies*, *Betula*, *Picea*, *Pinus wallichiana*) / Europe, Asia, N America / CIRCPOL / he.

Epilobium cylindricum D. Don (*E. roseum* var. *cylindricum* (D. Don) C. B. Clarke)

CHILAS: Ra: Tato, 2500 m, *Troll 7818*. — ASTOR: Ka: Kalapani Valley, 3400 m, *Troll 8048*. 2500-3400 m / submont.-subalp. / Tian Shan, Pamir, Himalaya: Kashmir – Bhutan, SW China / PAMIR / he.

Epilobium glaciale Raven

CHILAS: Go: Gor > NW, 2770 m, *Dickoré 12598* (!); 2770 m, *Dickoré 12586* (!). — ASTOR: Da: Mushkin RH > SE, 2700 m, *Dickoré 12759* (!).

2700-2770 m / mont.: forest, moist, steppe-forest (*Pinus gerardiana*) / S Karakorum, W Himalaya / W HIM / he.

***Epilobium hirsutum* L. / Great Willowherb (e)**

CHILAS: Go: Gor, Ranote, 2120 m, *Nüsser 1194* (B!, cf.). — ASTOR: Da: Astor – Harchu, 2100 m, *Troll 7921*.

2100-2120 m / submont.: moist / Africa, Europe, Asia / EURAS / he.

***Epilobium latifolium* L. subsp. *latifolium* (*Chamaenerion latifolium* (L.) Th. Fr. & Lange) / danui (sh)**

CHILAS: Ra: Kosto Valley, 4300 m, *Nüsser 1411* (B!); Raikot Gl., nunatak, 4250 m, *Nüsser 386* (B!). — ASTOR: (Cat. Pak.). – As: Rama Valley, 3650 m, *Lanckester & Pearson 1252* (BM, 1967-07-30, Fl. Pak. 139). – Ru: Latobo, 3600 m, *Troll 7403*; Latobo, Tap Gl., 3800 m, *Nüsser 48* (B!); Rupal Valley, 3600 m, *Peer* (!); Rupal Valley, lower Mazeno BC moraine, 4050 m, *Nüsser 1527* (B!); Toshain Valley, moraine, 4700 m, *Nüsser 1523* (B!). – Ka: Faqirkot – Chuno Gl., 3800 m, *Hansen 172* (!). — ASTOR/DEOSAI: Burzil P., *Meebold* (G, Fl. Pak. 139); 3650 m, C. B. *Clarke 29881* (BM, K, Fl. Pak. 139).

3600-4700 m / subalp.-subniv.: boulder slope, scree / Asia, S to W Himalaya, N America / CIRC POL / he.

***Epilobium laxum* Royle (*E. amplectens* (C. B. Clarke) Benth. ex Hausskn., *E. tetragonum* var. ? *amplectens* C. B. Clarke)**

ASTOR: R. R. *Stewart 21994* (Cat. Pak.). – As: Das Kirim – Sardar Kothi, R. R. *Stewart & E. Nasir 21994* (K, Fl. Pak. 139); Rama >, R. R. *Stewart & E. Nasir 22888a* (RAW, Fl. Pak. 139); Rama Valley, *Lanckester & Pearson 1271* (BM, Fl. Pak. 139). – Ka: Kalapani, 3260 m, *Schickhoff 1245* (!). — ASTOR/KASHMIR: Kamri P., R. R. *Stewart & E. Nasir 22734* (RAW, Fl. Pak. 139). — ASTOR/DEOSAI: Burzil P., 3960 m, R. R. *Stewart & E. Nasir 22056* (RAW, Fl. Pak. 139).

3260-3960 m / mont.-alp.: forest (*Abies*) / Tian Shan, Pamir, W Himalaya / PAMIR / he.

***Epilobium palustre* L. / Marsh Willowherb (e)**

ASTOR/DEOSAI: Deosai P., R. R. & I. D. *Stewart & E. Nasir 22149* (RAW, K, Fl. Pak. 139).

Europe, Asia S to Himalaya, N America / CIRC POL / he.

***Epilobium parviflorum* Schreb. / Hoary Willowherb (e)**

CHILAS: Go: Thelichi, 1260 m, *Dickoré 12517* (!). — ASTOR: Da: Doian <, 1680 m, *Nüsser 720* (B!, cf.).

1260-1680 m / coll.: moist, semi-desert, watercourse / N Africa, Europe, Asia / EURAS / he.

***Epilobium rhynchosperrum* Hausskn.**

ASTOR/KASHMIR: Kamri P., 3040 m, R. R. *Stewart & E. Nasir 22644* (RAW, Fl. Pak. 139).

3040 m / mont. / W Himalaya: Gilgit – Kashmir / W HIM / he.

***Epilobium royleanum* Hausskn. (*E. himalayense* Hausskn., *E. lividum* Hausskn., *E. roseum* var. *dalhousieanum* C. B. Clarke, *E. roseum* var. *indicum* C. B. Clarke)**

CHILAS: Babusar – Gilgit, S. *Abedin 9139* (KUH, Fl. Pak. 139). – Go: Gor > NW, 2600 m, *Dickoré 12545* (!); 2950 m, *Dickoré 12642* (!). – Ra: Raikot Valley, 3200 m, *Troll 7617* (“*E.*

himalayense”). — ASTOR: Da: Mushkin RH > SE, 2750 m, *Dickoré 12777* (!). — As: Gurikot, R. R. Stewart & E. Nasir 22968 (K, RAW, Fl. Pak. 139); Gurikot – Das Kirim, R. R. Stewart 22968 (Cat. Pak.). — Ka: Faqirkot, 2980 m, *Schickhoff 1313* (!); Shankargarh – Rattu, R. R. Stewart & E. Nasir 22755 (K, RAW, Fl. Pak. 139).

2600-3200 m / submont.-mont.: forest, moist, steppe-forest (*Picea*, *Pinus gerardiana*, *Pinus wallichiana*, *Quercus*) / Himalaya: Afgh. – Assam, SW China / HIMAL / he.

***Epilobium tibetanum* Hausskn.**

ASTOR: As: Rama, R. R. Stewart & E. Nasir 22911 (RAW, Fl. Pak. 139). — Ru: Tashing [Tarishing], 1856-09, *Schlagintweit* (“*E. leiospermum*”, Cat. Pak.); 1856-09-10/24, *Schlagintweit* (JE, lectotype of *E. tibetanum* Hausskn., Fl. Pak. 139). — Ka: Rattu, R. R. Stewart & E. Nasir 22802 (RAW, Fl. Pak. 139); Shankargarh, *Giles 646* (“*E. leiospermum*”, Cat. Pak.). — ASTOR/DEOSAI: Burzil P., 3350 m, C. B. Clarke 29714 (BM, K, Cat. Pak. “*E. leiospermum*”, Fl. Pak. 139).

3350-3350 m / mont. / Himalaya, SE Tibet / HIMAL / he.

[*Epilobium wattianum* Hausskn.]

CHILAS: Ra: Raikot Valley, 3200 m, *Troll 7617a*.

3200-3200 m / mont.

Identity unknown.

Orobanchaceae

***Orobanche alba* Stephan ex Willd. (*O. epithimum* DC.) / Thyme Broomrape (e)**

ASTOR: Da: Dashkin >, 3000 m, *Troll 7878*; Mushkin RH – Turbaling, 2620 m, *Dickoré 12746* (!).

2620-3000 m / submont.-mont.: forest, moist (*Pinus wallichiana*, *Salix wallichiana*) / Europe, Asia / EURAS / ge.

Parasitic mainly on *Labiatae*.

***Orobanche amoena* C. A. Mey.**

ASTOR: F. Schmid 1803 (RAW, also cited under “*O. hansii*”, Fl. Pak. 98). — Ka: Rattu, 3000 m, R. R. & I. D. Stewart 18829a (RAW, “*O. hansii*”, Fl. Pak. 98); 3000 m, R. R. & I. D. Stewart 18829b (RAW, Fl. Pak. 98).

3000 m / mont. / Tian Shan, Pamir, Iran, Afgh., W Himalaya / PAMIR / ge.

Related to *O. cernua*, but with larger blue flowers.

***Orobanche cernua* Loefl.**

CHILAS: Ra: Jalipur, 1200 m, *Troll 7175*; Raikot Valley, Fary, 2700 m, *Nüsser 1020* (B!). —

ASTOR: Da: Dashkin, 2500 m, *Troll 7277*. — As: Gudai, *Aitchison 17* (Cat. Pak.); Gurikot, *Giles 52* (Cat. Pak.); Los, 2400 m, *Troll 7316*; Rattu – Rama, R. R. Stewart 21809 (RAW, “var. *pseudo-clarkii*”, Fl. Pak. 98). — Ka: Rattu, R. R. Stewart (Cat. Pak.).

1200-2700 m / coll.-mont.: ruderal, scrub, steppe / N Africa, S Europe, SW & C. Asia, Himalaya / MEDIT / ge.

[Orobanche clarkei Hook. f.]ASTOR: *C. B. Clarke 25735a* (K, Cat. Pak.).

SW Karakorum, W Himalaya: Chitral – Kashmir / W HIM / ge.

Doubtful species, identical with *O. alba*?*[Orobanche solmsii* C. B. Clarke]ASTOR: Ka: Kalapani – Kamri P., 3200 m, *Troll 8076*. — ASTOR/DEOSAI: Burzil, *C. B. Clarke 29628a* (Cat. Pak.).

3200-3200 m / mont. / W Himalaya: Kashmir – Nepal / W HIM / ge.

May be only a form of *O. cernua*.**Oxalidaceae***Oxalis corniculata* L. (*O. villosa* M. Bieb., *O. foliosa* Blatter) / khatti booti (u), Procumbent Yellow-sorrel (e)ASTOR: Da: Bunji, 1400 m, *Troll 7186*.

1400 m / coll.: moist, ruderal / cosmopolitan / COSMO / he.

Papaveraceae (incl. *Fumariaceae*)*Corydalis clarkei* Prain (*C. moorcroftiana* Wall. ex Hook. f. & Thomson)ASTOR/KASHMIR: Kamri P. top, 3650-4570 m, *R. R. & I. D. Stewart 18678* (RAW, Fl. Pak. 73). — ASTOR/DEOSAI: Burzil Chowki >, *R. R. Stewart 19960* (RAW, Fl. Pak. 73); Burzil P., *R. R. & I. D. Stewart 19049* (RAW, Fl. Pak. 73); *R. R. & I. D. Stewart 22873* (RAW, Fl. Pak. 73); Burzil P. >, *R. R. & I. D. Stewart 19081* (RAW, Fl. Pak. 73).

3650-4570 m / subalp.-subniv. / SW Karakorum, NW Himalaya: Baltistan, Deosai, Kashmir / ENDEM / he.

Corydalis crithmifolia Royle (? *C. crithmifolia* var. *munroi* Fedde)CHILAS: Go: Gor, Kahlimag >, 3780 m, *Nüsser 1103* (B!). — Pa: Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser 1370a* (B!). — Ra: Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser 1427* (B!). — ASTOR/KASHMIR: Kamri P., *R. R. & I. D. Stewart 22664* (RAW, Fl. Pak. 73).— ASTOR/DEOSAI: Burzil P. on Skardu Rd., *Winterbottom 642* (Cat. Pak.).
3780-4490 m / subalp.-alp. / W Himalaya: Chitral – Garhwal / W HIM / he.*Corydalis diphylla* Wall. (*C. griffithii* Boiss.)

ASTOR/KASHMIR: Kamri P. (Cat. Pak.).

Alp. / W Himalaya / W HIM / ge.

Troll reports this from the Kashmir side only.

Corydalis flabellata Edgew.CHILAS: Ra: Tato, 2400 m, *Troll 7828*.

2400 m / submont. / Karakorum, W Himalaya: Kashmir – Nepal / W HIM / he.

Corydalis gortschakovii Schrenk (*C. moorcroftiana* Hook. f. & Thomson p.p., *C. onobrychis* Fedde, *C. onobrychoides* Fedde)

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12932* (!). – Pa: Pattaro Valley, 4500-4800 m, *Troll 7730* (“*C. onobrychis*”); Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser 1370b* (B!); Pattaro Valley, Guttum Sagar – Kosto Gali, 4790 m, *Nüsser 1403* (B!). – Ra: Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser 1321* (B!); Raikot Gl., nunatak, 4250 m, *Nüsser 385* (B!). — ASTOR: Ru: Latobo S, 4320 m, *Nüsser 80* (B!); Mazeno High Camp, ascent, 4550 m, *Nüsser 1491* (B!); upper Rupal Valley, 3600-4000 m, *Troll 7427* (“*C. onobrychoides*”). — ASTOR/KASHMIR: Kamri P., *R. R. Stewart 18707* (RAW, Fl. Pak. 73). — ASTOR/DEOSAI: Burzil Chowki, *R. R. Stewart 20001* (RAW, Fl. Pak. 73). 3600-4800 m / subalp.-subniv.: boulder slope, dwarf scrub, rock, scree, turf / Tian Shan, Pamir, Karakorum, W Himalaya: Afgh. – Kashmir / PAMIR / he.

Corydalis govaniiana Wall. / bhutkis (u)

ASTOR: Ka: Kalapani, 3700 m, *Hansen 71b* (!); Kalapani Valley, 2800-3800 m, *Troll 7972*. — ASTOR/KASHMIR: Kamri P. etc., 2430-3960 m (Cat. Pak.). 2430-3960 m / submont.-alp. / W Himalaya: Swat – Nepal / W HIM / he. Medicinal.

Corydalis thyrsoflora Prain (*C. gortschakovii* sensu Hook. f., non Schrenk)

ASTOR: *Falconer 4427* (Cat. Pak.). – As: Chillam, *R. R. & I. D. Stewart 18986* (RAW, Fl. Pak. 73). — ASTOR/DEOSAI: Burzil, 4000 m, *Koelz 9456* (RAW, Fl. Pak. 73). 4000 m / alp.: gravel, stream, wet / W Himalaya / W HIM / he.

[*Corydalis tibetica* Hook. f. & Thomson]

ASTOR/DEOSAI: Burzil P., *Coventry* (Cat. Pak.). Kashmir, Baltistan, W Tibet / ENDEM / he. Doubtful record.

Corydalis vaginans Royle (*C. ramosa* Hook. f. & Thomson)

CHILAS: Babusar Village, 4000 m, *M. A. Siddiqi & Y. Nasir 2794* (RAW, Fl. Pak. 73). 4000 m / alp. / W Himalaya: Afgh. – Kashmir / W HIM / he. Determined as *C. longipes* DC. in Cat. Pak.

Fumaria indica (Hauskn.) Pugsley (*F. parviflora* auct., non Lam.)

ASTOR: Da: Doian, 2400-2700 m, *Troll 7219*. 2400-2700 m / submont.-mont. / SW Asia, Afgh., Pakistan, India / IRAN / th.

[*Meconopsis aculeata* Royle]

ASTOR/DEOSAI: Burzil (Kazmi & Siddiqui 1953). W Himalaya / W HIM / he. Doubtful record, probably referring to the Kishenganga Valley. Medicinal, poisonous.

Papaver nudicaule L. (*P. croceum* Ledeb.)

CHILAS: Babusar P., 4050 m, *Miehe 455* (!); Babusar P. N, 3700 m, *Dickoré 12844* (!); Babusar Village, 4000 m, *M. A. Siddiqi & Y. Nasir 2728* (RAW, Fl. Pak. 61). – Go: Gor, 3520 m, *Schickhoff 1509* (!). – Pa: Diamir Valley, Kutgali, 3600 m, *Peer* (!); Pattaro Valley,

Guttum Sagar >, 4450 m, *Nüsser 1331* (B!). – Ra: Raikot Gl., nunatak, BC, 4030 m, *Nüsser 524* (B!). — ASTOR: Da: Doian Ridge, 3800 m, *Troll 7566*. – As: Rama Valley, left slope, 4100 m, *Nüsser 221* (B!). – Ka: Kamri Valley, 4000 m, 1892-08-25, *Duthie* (RAW, Fl. Pak. 61). — ASTOR/DEOSAI: Burzil P., 4300 m, *R. R. & I. D. Stewart 19042* (RAW, Fl. Pak. 61); 4400 m, *R. R. Stewart 19859* (RAW, Fl. Pak. 61).
3520-4450 m / subalp.-alp.: avalanche path, scrub, scree / N & C. Asia, Karakorum, W Himalaya / C AS / he.

Parnassiaceae

[*Parnassia cabulica* Planch. ex C. B. Clarke (*P. laxmannii* auct., non Pallas)]

ASTOR: As: Gurikot, *Winterbottom* (Cat. Pak.).

Iran, Afgh., Pakistan / IRAN / he.

The record may refer to *P. laxmannii*.

Parnassia laxmannii Pallas ex Schultes (*P. ovata* sensu Hook. f. & Thomson p.p., non Ledeb.)

CHILAS: Go: Gor, Martal, 2970 m, *Nüsser 1135* (B!, cf.). – Ra: Raikot Valley, Jut – Pungadori, 3310 m, *Nüsser 336* (B!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 348* (B!). — ASTOR: Da: Doian – Muthat, 3300 m, *Troll 7564* (“*P. ovata*”). – Ru: Rupal Valley, Nagachakali, nunatak, 3620 m, *Nüsser 642* (B!); village Lower Rupal, 3100 m, *Nüsser 1591* (B!).

2970-3620 m / mont.-subalp.: flush, moraine / Siberia, Mongolia, Altai, Tian Shan, Pamir, Karakorum, Himalaya: Gilgit – SW China / C AS / he.

[*Parnassia nubicola* Wall. ex Royle]

CHILAS: Bu: Muthat, 2700 m, *Troll 7564a*.

2700 m / mont. / ?SW Karakorum, W Himalaya / W HIM / he.

The record may also refer to *P. laxmannii*. True *P. nubicola* seems to be confined to the S slope of the Himalaya, subsp. *occidentalis* Schönbeck-Temesy is of doubtful identity.

Plantaginaceae

Plantago depressa Willd. (*P. tibetica* Hook. f. & Thomson) / khupa kato (sh)

CHILAS: Ra: Raikot Valley, Batharet, 3410 m, *Nüsser 998* (B!); Raikot Valley, Pungadori, 3240 m, *Nüsser 916* (B!); 3290 m, *Nüsser 338* (B!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 325* (B!). — ASTOR: Ru: Tarishing, 2910 m, *Nüsser 572* (B!).

2910-3410 m / mont.-subalp.: meadow / Asia: Ural – Siberia, Mongolia, Tian Shan, Pamir, Himalaya, China, Japan / C AS / he.

Plantago lanceolata L. / Ribwort (e)

CHILAS: Go: Gor > NW, 2600 m, *Dickoré 12544* (!); Gor, Ranote, 2120 m, *Nüsser 1190* (B!).

2120-2600 m / submont.: flush, meadow, ruderal, steppe-forest (*Pinus gerardiana*, *Quercus*) / Africa, Europe, Asia / EURAS / he.

Medicinal.

***Plantago major* L. / Great Plantain (e)**

CHILAS: Go: Gor, Ranote, 2120 m, *Nüsser 1197* (B!).

2120 m / submont.: moist, ruderal / Europe, Asia (introduced cosmopolitan) / EURAS / he.

Platanaceae***Platanus orientalis* L. / buin, chinara (u), Oriental Plane (e)**

CHILAS: Chilas – Babusar, 1200-1330 m (*Dickoré*). – Go: Gor, 1970 m (*Dickoré*). — ASTOR: Da: Mushkin (cultivated, Kazmi & Siddiqui 1953). – As: Astor (cultivated, Kazmi & Siddiqui 1953).

1200-1970 m / coll. / SE Europe, SW Asia – W Himalaya / IRAN / ph.

A valuable shade tree, wood less valuable, bark medicinal. Probably mostly cultivated, a few large trees in shady valleys.

Plumbaginaceae***Acantholimon lycopodioides* (Girard) Boiss. (*Statice lycopodioides* Girard) / tari (sh)**

CHILAS: Babusar P., 4050 m, *Miehe 457* (!).— ASTOR: (Cat. Pak.). – Da: Astor – Bunji, 1954-05-28, *F. Schmid* (RAW, Fl. Pak. 28). – Ka: Rattu, 2700 m, *Troll 7379*.

2700-4050 m / mont.-alp.: moraine, scree, steppe / Pamir, Afgh., Karakorum, Ladakh, W Himalaya / PAMIR / ch.

Apparently not common on Nanga Parbat.

***Dictyolimon cabulicum* (Boiss.) Rech. f. (*Statice cabulica* Boiss., *Limonium cabulicum* (Boiss.) Kuntze, *Aeoniopsis cabulica* (Boiss.) Rech. f.)**

CHILAS: Bu: Muthat – Raikot Bridge, 2330 m, *Nüsser 1050* (B!).

2330 m / submont. / Afgh., Baluch., W Himalaya / IRAN / he.

***Dictyolimon gilesii* (Hemsley) Rech. f. (*Statice gilesii* Hemsley, *Limonium gilesii* (Hemsley) Rech. f. & Koe)**

CHILAS: Go: Bunji – Thelichi, 1400 m, *Troll 7191*. — ASTOR: Da: Astor – Bunji, *F. Schmid 1796* (Cat. Pak.); Ramghat, 1200-1800 m, *Troll 7049*.

1200-1800 m / coll. / Gilgit, Astor / ENDEM / he.

***Dictyolimon macrorrhabdos* (Boiss.) Rech. f. (*Limonium macrorrhabdon* (Boiss.) Kuntze, *Statice macrorrhabdos* Boiss.)**

CHILAS: Go: Gor > NW, 2600 m, *Dickoré 12565* (!). — ASTOR: Da: Harchu Valley, Baro Nirril >, 3210 m, *Nüsser 870* (B!); Hattu Pir, 3100 m, *Nüsser 280* (B!). – As: Gurikot – Kirim, 1954-07-19, *R. R. Stewart* (Fl. Pak. 28); Gurikot E, 2400-2800 m, *Troll 7359*; Los, 2800 m, *Troll 7322*.

2400-3210 m / submont.-mont.: dwarf scrub, steppe-forest (*Artemisia brevifolia*, *Pinus gerardiana*, *Quercus*) / Baluch., Afgh., SW Karakorum, W Himalaya / W HIM / he.

Polemoniaceae***Polemonium caeruleum* L. / jhal (u), Jacob's-ladder (e)**

ASTOR: Ru: Chichi Valley, 3200 m, *Troll 7496*. – Ka: Kalapani, 3260 m, *Schickhoff 1226* (!);

Kalapani Valley, 3200 m, *Troll 7995*. — ASTOR/DEOSAI: Sochar P. <, *E. Nasir & Webster 6389* (RAW, Fl. Pak. 8).

3200-3260 m / mont.: forest (*Abies*) / Europe, Asia, N America / CIRC POL / he.

Polygonaceae

Aconogonon alpinum (All.) Schur (*Polygonum alpinum* All.) / chirko (sh), Alpine knotweed (e)

CHILAS: Babusar P. N, *S. Abedin & M. Qaiser 9039* (KUH, Qaiser & Omer ms.); Babusar Village, *M. Qaiser & A. Ghafoor 5392* (KUH, Qaiser & Omer ms.); 3960 m, *M. A. Siddiqi & Y. Nasir 2769* (RAW, Qaiser & Omer ms.). — ASTOR: (Cat. Pak.). — Ru: Chichi Valley, 3100 m, *Troll 7479*; Chugam – Rattu, 2500-3500 m, *Troll 7939*. — Ka: Faqirkot, 2800 m, *Hansen 53* (!); 2980 m, *Schickhoff 1329* (!); Kamri Valley, *Duthie 12521* (K, Qaiser & Omer ms.); Shankargarh, *Giles 643* (K, Qaiser & Omer ms.). — ASTOR/DEOSAI: Burzil (Cat. Pak.).

2500-3960 m / submont.-alp.: forb, forest, meadow, scree, scrub (*Artemisia santolinifolia*, *Pinus wallichiana*) / Europe, Asia, N America / CIRC POL / he.

Aconogonon rumicifolium (Royle ex Bab.) Hara (*Polygonum rumicifolium* Royle ex Bab., *P. glaberrimum* Kitam.) / lamey, lamé (sh)

CHILAS: Pa: Pattaro Valley, Guttum Sagar >, 4450 m, *Nüsser 1334* (B!). — Ra: Kosto Valley, 4150 m, *Nüsser 1447* (B!); Raikot Gl., nunatak, BC, 3910 m, *Nüsser 1298* (B!); Raikot Valley, 3560 m, *Schickhoff 1648* (!). — Bu: Lichar Valley, Darsh Sagar, 3200 m, *Troll 7607*. — ASTOR: (Cat. Pak.). — Da: Rama Ridge N, 3600 m, *Troll 7303*. — Ka: Faqirkot / Kamri – Top, 3360 m, *Hansen 68* (!); Kalapani, 3200 m, *Giles 153* (K, Qaiser & Omer ms.). — ASTOR/DEOSAI: Burzil P., 4260 m, *R. R. & I. D. Stewart 19054* (KUH, Qaiser & Omer ms.).

3200-4450 m / mont.-alp.: dwarf scrub, forb, forest, scrub (*Betula*, *Juniperus excelsa*, *Rhododendron anthopogon*, *Salix karelinii*) / Himalaya: E Afgh. – Nepal, SE Tibet / HIMAL / he.

Aconogonon tortuosum (D. Don) Hara (*Polygonum tortuosum* D. Don) / lamay (sh)

CHILAS: Bu: Buldar Valley, Mamocha Peak <, 3500-4000 m, *Troll 7862*. — ASTOR: Da: Harchu Valley, Baro Nirril >, 3120 m, *Nüsser 888* (B!, cf.). — As: Gudai – Chillam, *S. Omer & M. Qaiser 2527* (KUH, Qaiser & Omer ms.); Gudai Valley, 3350-3650 m, *Duthie 12195* (E, K, Qaiser & Omer ms.); Rama, 3040 m, *R. R. Stewart 22887* (K, Cat. Pak., Qaiser & Omer ms.); Rama – Rama Lake, 3650 m, *S. Omer & M. Qaiser 2371* (KUH, Qaiser & Omer ms.). — Ru: Latobo, Tap Gl., left lateral moraine, 3660 m, *Nüsser 38* (B!); Rupal Valley, 3700 m, *Peer* (!); Rupal Valley, Nagachakali, nunatak, 3550 m, *Nüsser 649* (B!); 3710 m, *Nüsser 618* (B!); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1561* (B!); upper Mazeno BC, 4320 m, *Nüsser 1471* (B!). — Ka: Kamri Valley, *R. R. Stewart* (Cat. Pak.); Rattu >, *R. R. Stewart* (Cat. Pak.); 2890 m, *R. R. & I. D. Stewart 18783* (RAW, Qaiser & Omer ms.); upper Astor Valley, 2740-3040 m, *R. R. & I. D. Stewart 18743* (KUH, RAW, Qaiser & Omer ms.).

2740-4320 m / mont.-alp.: moraine, turf / W Himalaya, W Tibet / W HIM / he.

Bistorta affinis (D. Don) Greene (*Polygonum affine* D. Don) / garazap, titeri (sh)

CHILAS: Babusar P., S. Abedin & M. Qaiser 9028 (KUH, Qaiser & Omer ms.); 4050-4100 m, *Miehe* 458 (!); Babusar P. N, 3620 m (*Dickoré*). – Go: Gor, 3520 m, *Schickhoff* 1478 (!); Gor, Kahlimay, 3610 m, *Nüsser* 1090 (B!). – Pa: Pattaro Valley, 3570 m, *Nüsser* 1351 (B!); 3950 m, *Nüsser* 1356 (B!); Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser* 1372 (B!). – Ra: Bezar Gali S, Fulu, 4180 m, *Nüsser* 540 (B!); Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser* 1430 (B!); Raikot Gl. – Ganalo Gl. confluence, 3850 m, *Nüsser* 300 (B!); Raikot Gl., nunatak, 3950 m, *Nüsser* 444 (B!); Raikot Gl., nunatak, BC, 3910 m, *Nüsser* 1295 (B!); 3990 m, *Nüsser* 456 (B!); 4100 m, *Nüsser* 479 (B!); 4430 m, *Nüsser* 506 (B!); Raikot Valley, 3560 m, *Schickhoff* 1637 (!); Raikot Valley, Bayal, 3600 m, *Nüsser* 1274 (B!). — ASTOR: Da: Harchu Valley, 3500 m, *Nüsser* 843 (B!). – As: Astor – Rama, S. Omer 352 (KUH, Qaiser & Omer ms.); Rama – Rama Lake, 3650 m, S. Omer & M. Qaiser 2377 (KUH, Qaiser & Omer ms.); Rama Ridge, 4000 m, *Nüsser* 217 (B!). – Ru: Latobo, Tap Gl., 4000 m, *Nüsser* 55 (B!); Rupal Ridge, 3200 m, *Troll* 7472; Rupal Valley, Nagachakali, nunatak, 3440 m, *Nüsser* 597 (B!); 3620 m, *Nüsser* 645 (B!); 3710 m, *Nüsser* 616 (B!); 3870 m, *Nüsser* 623 (B!); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser* 1545 (B!); upper Mazeno BC, 4320 m, *Nüsser* 1462 (B!). – Ka: Faqirkot, 3600 m, *Hansen* 188 (!, cf.). — ASTOR/DEOSAI: Burzil P., 3200 m, C. B. Clarke 29615 (K, Qaiser & Omer ms.). 3200-4490 m / mont.-alp.: dwarf scrub, forest, meadow, moraine, rock, scrub, turf (*Betula*, *Kobresia capillifolia*, *Rhododendron*, *Salix karelinii*) / Himalaya: E Afgh. – Nepal, SE Tibet / W HIM / ch.

Bistorta vivipara (L.) S. F. Gray (*Polygonum viviparum* L.) / mashum (u) / Alpine Bistort (e)

CHILAS: Babusar P., 4300 m, *Miehe* 470 (!). – Go: Gor, Martal, 2930 m, *Nüsser* 1082 (B!); 2970 m, *Nüsser* 1147 (B!). – Pa: Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser* 1386 (B!). – Ra: Ganalo Gl., nunatak, BC, 4200 m, *Nüsser* 514 (B!); Raikot Gl. tongue, 3230 m, *Nüsser* 1008 (B!); Raikot Gl., nunatak, 4120 m, *Nüsser* 376 (B!); Raikot Gl., nunatak, BC, 4300 m, *Nüsser* 488 (B!); 4400 m, *Nüsser* 499 (B!); Raikot Valley, Kilo Sagar, 3800 m, *Troll* 7785; Raikot Valley, Pungadori Lake, 3300 m, *Nüsser* 344 (B!). — ASTOR: As: Chongra, 2500 m, *Troll* 7312; Rama Valley, 3650 m, *Lankester & Pearson* 1256 (BM, Qaiser & Omer ms.); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff* 1036 (!). – Ru: Rupal Valley, Nagachakali, nunatak, 3620 m, *Nüsser* 610 (B!); 3870 m, *Nüsser* 628 (B!). — ASTOR/DEOSAI: Burzil P., R. R. Stewart 19875 (RAW, Qaiser & Omer ms.). 2500-4490 m / submont.-alp.: dwarf scrub, forest, irrigation, scrub, turf (*Abies*, *Kobresia capillifolia*, *Rhododendron*, *Salix karelinii*) / Europe, Asia (S to Himalaya), N America / CIRC POL / he.

● ***Fagopyrum esculentum*** Moench (*Polygonum fagopyrum* L., *F. sagittatum* Gilib. nom. illeg.) / Buckwheat (e)

ASTOR: (Cat. Pak.).

Cultivated / th.

● ***Fagopyrum tataricum*** (L.) Gaertn. (*Polygonum tataricum* L.) / gairi ginger, burau, chuoki (sh), Green Buckwheat (e)

ASTOR: (Cat. Pak.). – Ka: Faqirkot, *Hansen 200* (!); 2800 m, *Hansen 79* (!).
2800 m / mont. / cultivated / th.

Fallopia convolvulus (L.) Á. Löve (*Polygonum convolvulus* L.) / Black-bindweed (e)

ASTOR: (Cat. Pak.).

N Africa, Europe, Asia, N America / CIRCPO / th.

Also reported from Gilgit, Nubra, Chitral, Hazara, Kashmir, Zanskar.

Fallopia dumetorum (L.) Holub (*Polygonum dumetorum* L.) / Copse-bindweed (e)

ASTOR: As: Astor Bazar, 2400 m, *Troll 7930*.

2400 m / submont.: field, ruderal / Europe, Asia (S to Himalaya) / EURAS / th.

Also reported from Gilgit, Chitral, Swat, Hazara, Kashmir.

Koenigia delicatula (Meissner) Hara (*Polygonum delicatulum* Meissner)

ASTOR/DEOSAI: Burzil Chowki, 3040-3350 m, *R. R. Stewart 19787* (RAW, Qaiser & Omer ms.).

3040-3350 m / mont.: moist, turf / Himalaya: Kashmir – Bhutan, SE Tibet, China / HIMAL / th.

[*Koenigia islandica* L.]

Widespread in the Himalaya and Tibet, to be expected but so far not recorded from Nanga Parbat area.

Koenigia nepalensis D. Don (*K. filicaulis* (Wall. ex Meissner) Hedberg, *Polygonum filicaule* Wall. ex Meissner)

ASTOR: As: Burzil P. N, 3650 m, *R. R. Stewart 22025* (K, Cat. Pak., Qaiser & Omer ms.); 3650 m, *R. R. & I. D. Stewart 19092* (RAW, Qaiser & Omer ms.).

3650 m / subalp.: moist, turf / Himalaya: Kashmir – Bhutan, SE Tibet, China / HIMAL / th.

Oxyria digyna (L.) Hill (*Rumex digynus* L.) / gurko (sh), Mountain Sorrel (e)

CHILAS: Ra: Raikot Gl., nunatak, 4550 m, *Nüsser 402* (B!). — ASTOR: *Hansen 171* (!). – As: Bulan, 2500 m, *Troll 7332*; Chongra, *Hansen 126* (!). – Ru: Latobo, 3600 m, *Troll 7418*; Latobo, Tap Gl., 4000 m, *Nüsser 60* (B!); Rupal Valley, Bayals – Chungphare, 3200 m, *Nüsser 794* (B!); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1557* (B!). – Ka: Kalapani – Rattu, 3400 m, *Hansen 89* (!).

2500-4550 m / submont.-subniv.: irrigation, moraine, scree / Europe, Asia, N America / CIRCPO / he.

Persicaria amphibia (L.) S. F. Gray (*Polygonum amphibium* L.) / Amphibious Bistort (e)

ASTOR: (Cat. Pak.).

Europe, Asia, America / CIRCPO / he.

Persicaria glacialis (Meissner) Hara (*Polygonum glaciale* (Meissner) Hook. f.)

CHILAS: Babusar Village >, 2850 m, *Dickoré 12832* (!). — ASTOR: As: Rama, *R. R. Stewart* (Cat. Pak.). – Ru: Rupal Valley, *R. R. Stewart* (Cat. Pak.). – Ka: Kalapani, 3400 m, *Hansen*

93b (!). — ASTOR/DEOSAI: Burzil Chowki, R. R. & I. D. Stewart 19216 (RAW, Qaiser & Omer ms.).

2850-3400 m / subalp.: ruderal, turf / Himalaya: Afgh. – Nepal, Tibet / HIMAL / th.

Persicaria lapathifolia (L.) S. F. Gray (*Polygonum lapathifolium* L., *P. nodosum* Pers.) / Pale *Persicaria* (e)

ASTOR: (Cat. Pak.). – Ru: Environs of Tashing [Tarishing], 1856-09-16/24, *Schlagintweit* (BM, Qaiser & Omer ms.). – Ka: Rattu >, 2740 m, R. R. Stewart 22787 (K, “*P. nodosa*”, Qaiser & Omer ms.).

2740 m / mont. / Europe, Asia, N America / CIRCPOL / th.

[*Persicaria maculosa* S. F. Gray (*Polygonum persicaria* L., *Persicaria maculata* (Rafin.) S. F. Gray)]

ASTOR: (Cat. Pak.). – Ru: Tarishing, 3010 m (Kazmi & Siddiqui 1953).

3010 m / mont. / Europe, Asia, N America / CIRCPOL / th.

Medicinal. Doubtful record, to be confirmed (also recorded from Chitral, Hazara, Kashmir, Dras), but may refer to *P. lapathifolia*.

Persicaria nepalensis (Meissner) H. Gross / Nepal *Persicaria* (e)

CHILAS: Go: Gor > NW, 2770 m, *Dickoré 12597* (!). — ASTOR: As: Gurikot, 2400 m, *Troll 7552*; Rama Valley, 3130 m, *Lankester & Pearson 1438* (BM, Qaiser & Omer ms.); 3130 m, *Lankester & Pearson 1325* (BM, Qaiser & Omer ms.).

2400-3130 m / submont.-mont.: irrigation, moist, ruderal / Africa (trop.), Himalaya (Afgh. – SE Tibet), China, Japan / HIMAL / th.

Polygonum aviculare L. (*P. arenastrum* Boreau, *P. aequale* Lindman) / Knotgrass (e)

CHILAS: Ra: Raikot Valley, 3560 m, *Schickhoff 1650 1* (!). — ASTOR: As: Astor Bazar, Hotel, 2440 m, *Dickoré 12814* (!); 2440 m, *Nüsser 903* (B!); Rama Valley, 3200 m, *Lankester & Pearson 1240* (BM, Qaiser & Omer ms.). – Ka: Kalapani, 3010 m, *Schickhoff 1296* (!); 3260 m, *Schickhoff 1230* (!).

2440-3560 m / submont.-subalp.: fen, forest, ruderal (*Abies*, *Betula*) / Europe Asia, N America / CIRCPOL / th.

Polygonum cognatum Meissner (? *P. alpestre* C. A. Mey., *P. chitralicum* Rech. f. & Schiman-Czeika, *P. pamiroalaicum* Kom., *P. rupestre* Kar. & Kir.)

CHILAS: Ra: Tato, 2400 m, *Troll 7800* (“var. *rupestre*”). — ASTOR: Ru: Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1546* (B!).

2400-3950 m / submont.-alp.: ruderal, scree / SW Asia: Caucasus – Tian Shan, Pamir, SW Karakorum, W Himalaya / IRAN / ch.

Polygonum paronychioides C. A. Mey. ex Hohenacker (*P. himalaiense* H. Gross, *P. meyeri* Steudel, *P. mucronatum* Royle, *P. pulvinatum* Kom.)

CHILAS: Ra: Raikot Valley, Kilo Sagar, 4000 m, *Troll 7783*. — ASTOR: (Cat. Pak.). – Da: Dashkin <, 1900 m, *Troll 7270*. – As: Gurikot, 2600 m, *Troll 7357*. – Ru: Latobo, 3600 m,

Nüsser 29 (B!); Rupal Valley, 3800 m, *Peer* (!); Rupal Gl. ablation valley, 3950 m, *Nüsser 1537* (B!). – Ka: Shankargarh >, 2740 m, 1886-03, *Giles* (K, Qaiser & Omer ms.); 3040 m, *R. R. Stewart 22271* (K, Qaiser & Omer ms.).

1900-4000 m / coll.-alp.: rock, scree, steppe (*Artemisia brevifolia*) / SW Asia: Caucasus – W Himalaya (Kashmir) / IRAN / ch.

Polygonum polycnemoides Jaub. & Spach (*P. olivieri* Jaub. & Spach)

ASTOR: (Cat. Pak.). – As: Rama Valley, 3200 m, *Lankester & Pearson 1241* (BM, Qaiser & Omer ms.); Rama Valley, Sango Sar, moraine Sachen Gl., 3500 m, *Nüsser 156* (B!).

3200-3500 m / mont.-subalp. / SW Asia: Turkey, Lebanon, Caucasus, Iran, Afgh., Pamir, NW Himalaya / IRAN / th.

Polygonum rottboellioides Jaub. & Spach (*P. tubulosum* Boiss.)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1738* (!). – Go: Gor, 2420 m, *Dickoré 12659* (!); 2690 m, *Schickhoff 1594* (!); 3230 m, *Schickhoff 1556* (!); Gor > NW, 2600 m, *Dickoré 12541* (!); 2840 m, *Dickoré 12609* (!). – Ra: Raikot Valley, Fary, 2700 m, *Nüsser 1019* (B!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 334* (B!). – Bu: Buldar Valley, Mamocha Peak <, 3400-3800 m, *Troll 7856* (“*P. tubulosum*”). — ASTOR: Da: Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 224* (B!). – Ka: Kalapani, 3050 m, *Schickhoff 1263* (!); Rattu, 2600 m, *Troll 7377* (“*P. tubulosum*”).

2420-3800 m / submont.-subalp.: dwarf scrub, forest, ruderal, steppe-forest, turf (*Artemisia brevifolia*, *A. santolinifolia*, *Cedrus*, *Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / Iran, Afgh., SW Karakorum, W Himalaya / IRAN / th.

Inclusive “var. *tibeticum*” (Hook. f.) *R. R. Stewart* (Himalaya: Chitral – Nepal, S Tibet).

Rheum webbianum Royle / haluskir, tari, chaontal, bambala (sh), lachu, rewanchini (u)

CHILAS: Pa: Pattaro Valley, Guttum Sagar >, 4450 m, *Nüsser 1348* (B!, cf.). — ASTOR: Da: Harchu Valley, 2500 m, *Troll 7291*. – As: Chillam (Cat. Pak.). – Ru: Rupal Valley, Chilendas >, 3710 m, *Nüsser 24* (B!, cf.); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1554* (B!); upper Rupal Valley, 3000-3600 m, *Troll 7409*. – Ka: Kalapani (Cat. Pak.); 3040 m (“*Rh. emodi*”, Kazmi & Siddiqui 1953); Rattu, 2740 m (“*Rh. emodi*”, Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil P., 3040-4260 m (Cat. Pak.).

2500-4450 m / submont.-alp.: rock, scree / SW Karakorum, W Himalaya: Kashmir – Nepal / W HIM / he.

Medicinal.

Rumex acetosa L. / kapenpato (sh), Common Sorrel (e)

ASTOR: 2430-3650 m (Kazmi & Siddiqui 1953). – Ru: Chichi Valley, 3200 m, *Troll 7493*. 2430-3650 m / mont.: avalanche path, forest, meadow, moist (*Betula*) / Europe, Asia, N America / CIRCPOL / he.

Common on Deosai Plains.

Rumex hastatus D. Don / chirki (sh)

CHILAS: Babusar Valley, 1350 m, *Schickhoff 1725* (!); Chilas – Babusar, 1140-1700 m (*Dickoré*). – Go: Gor, 1850 m, *Schickhoff 1461* (!); 2160 m (*Dickoré*). – Bu: Muthat –

Raikot Bridge, 2280 m, *Nüsser 1056* (B!). — ASTOR: Da: Bunji, 1300 m, *Troll 7192*; Indus Valley, KKH – Old Bunji Bridge, 1310 m, *Nüsser 707* (B!); 1380 m, *Nüsser 705* (B!); Ramghat, 1200-1800 m, *Troll 7057*; 1240 m (*Dickoré*).

1140-2280 m / coll.-submont.: scree, semi-desert, steppe (*Artemisia fragrans*) / Hindukush, SW Karakorum, Himalaya, SW China / HIMAL / ch.

Rumex nepalensis Spreng. / hubbell (sh)

CHILAS: Babusar Valley, 2750 m (*Schickhoff 1736*). – Pa: Pattaro Valley, Zangal, 2650 m, *Troll 7692*. – Ra: Fairy Meadows, 3310 m, *Nüsser 369* (B!); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 323* (B!). – Bu: Muthat, 2800 m, *Troll 7590*. — ASTOR: (Cat. Pak.). – Ka: Kalapani, 3050 m, *Schickhoff 1279* (!); 3260 m, *Schickhoff 1204* (!).

2650-3310 m / submont.-mont.: dwarf scrub, forest (*Abies*, *Artemisia santolinifolia*, *Cedrus*) / EURAS / SE Europe, W Asia, Himalaya, W & C. China / he.

Rumex patientia subsp. *pamiricus* (Rech. f.) Rech. f. (*R. pamiricus* Rech. f.) / fantul, hubabel (sh)

ASTOR: As: Chongra / Zail, 2600 m, *Hansen 77* (!, cf.). – Ka: Faqirkot, 2800 m, *Hansen 78* (!); Shankargarh, *Giles 656* (Cat. Pak.).

2600-2800 m / submont.-mont. / C AS / SW & C. Asia, W Himalaya: Kashmir – Nepal / he.

Primulaceae

Androsace aizoon Duby / ruyon shinon (sh)

CHILAS: Go: Gor, 2900 m (*Dickoré*); Gor > NW, 2600 m, *Dickoré 12574* (!); 2600 m, *Dickoré 12583* (!); 2840 m, *Dickoré 12611* (!); Gor, Kahlmay <, 3210 m, *Nüsser 1126* (B!); Gor, Terimal, 2700 m, *Troll 7121* (“var. *himalaica*”). – Ra: Bezar Gali <, 3570 m, *Nüsser 927* (B!). — ASTOR: *Tanner 199* (K, “subsp. *brirensis*”, Fl. Pak. 157). – Da: Dashkin, *Giles 564* (K, “subsp. *brirensis*”, Fl. Pak. 157); *R. R. Stewart* (“var. *himalaica*”, Cat. Pak.); Doian, 2280 m, 1950-06-25, *A. H. Khan* (PPFI-B, “subsp. *brirensis*”, Fl. Pak. 157); Hattu Pir, 3100 m, *Nüsser 281* (B!); Turbaling – Doian, 2650 m, *Dickoré 12819* (!). – As: Chongra – Bakh, 2800 m, *Hansen 184* (!); Rama Forest, *A. H. Khan* (PPFI-B, “subsp. *brirensis*”, Fl. Pak. 157); Rattu – Gurikot, 2430 m, 1954-05-25, *F. Schmid* (K, RAW, “subsp. *brirensis*”, Fl. Pak. 157). – Ka: Rattu, *R. R. Stewart* (“var. *himalaica*”, Cat. Pak.).

2280-3570 m / submont.-subalp.: dwarf scrub, rock, steppe-forest (*Artemisia brevifolia*, *Astragalus strobiliferus*, *Krascheninnikovia*, *Pinus gerardiana*, *Quercus*) / NW Himalaya: Chitral – Kashmir / ENDEM / he.

An isolated W Himalayan endemic of the *Pinus gerardiana* belt, with its next relatives in SE Tibet; subsp. *brirensis* Y. Nasir seems to represent an extreme form of arid habitats.

Androsace baltistanica Y. Nasir (*A. villosa* auct., non L.)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2745* (RAW, Fl. Pak. 157). – Go: Gor, 3520 m, *Schickhoff 1502* (!). — ASTOR: *Duthie* (Cat. Pak.). – As: Chongra Valley, 3650 m, *Lankester & Pearson 1506* (BM, Fl. Pak. 157). – Ru: Upper Rupal Valley, 3600 m, *Troll 7449* (cf., “*A. globifera*”).

3520-3960 m / subalp.-alp.: scrub / S Karakorum, NW Himalaya: Gilgit, Astor, Deosai, Baltistan, Ladakh / ENDEM / ch.

[*Androsace dasyphylla* Bunge (*A. villosa* var. *dasyphylla* (Bunge) Kar. & Kir.)]

ASTOR: (Cat. Pak.).

C. Asia / C AS / ch.

Probably misidentification of *A. baltistanica*.

***Androsace duthieana* Knuth**

ASTOR/KASHMIR: Kamri P., 3960 m, *R. R. & I. D. Stewart 18697* (GH, K, RAW, Fl. Pak. 157).

3960 m / alp. / NW Himalaya: Hazara, Kashmir / ENDEM / ch.

***Androsace foliosa* Decne. ex Duby (*A. sarmentosa* var. *foliosa* Hook. f.)**

ASTOR: Ru: Tap Gl. right lateral moraine, 3590 m, *Nüsser 736* (B!, veg.).

3590 m / subalp. / W Himalaya: E Afgh. – Kashmir / W HIM / he.

Common on the Himalaya S slope.

***Androsace mucronifolia* Watt (*A. globifera* Klatt, non Duby, *A. microphylla* Hook. f.)**

CHILAS: Babusar P., 4300 m, *Miehe 490* (!); *Miehe 518* (!); Babusar 2 miles <, *Kemal & M. Qaiser 464* (KUH, Fl. Pak. 157); Babusar P. N, 3700 m, *Dickoré 12855* (!); Babusar P. NE, 4210 m, *Dickoré 12921* (!). – Pa: Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser 1373* (B!); Pattaro Valley, Guttum Sagar, moraine, 4490 m, *Nüsser 1389* (B!). – Ra: Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser 1320* (B!); Raikot Gl., nunatak, 4200 m, *Nüsser 383* (B!). — ASTOR: *Aitchison 15* (K, Fl. Pak. 157). – Da: Doian >, 1892-08-14, *Duthie* (E, Fl. Pak. 157). – As: Rama Valley, 3810 m, *Lankester & Pearson 1347* (BM, Fl. Pak. 157). – Ru: Mazeno Gl., 4300 m, *Peer* (!); Mazeno High Camp, ascent, 4600 m, *Nüsser 1502* (B!); upper Rupal Valley, 3500 m, *Troll 7448*. — ASTOR/KASHMIR: Kamri P., *R. R. Stewart 27703a* (K, Fl. Pak. 157). — ASTOR/DEOSAI: Burzil, *R. R. Stewart 22045* (K, Fl. Pak. 157); 3350 m, *Koelz 9383* (GH, Fl. Pak. 157).

3350-4600 m / mont.-subniv.: avalanche path, dwarf scrub, rock, scree, turf / S Karakorum, W Himalaya: Afgh. – NW India/ W HIM / ch.

***Androsace muscoidea* Duby (*Primula duthiei* Derganc, *P. dubyana* Kuntze, *A. selago* auct., non Watt)**

CHILAS: Babusar, 3960 m, *S. Iqbal & Ashraf 393* (ISL, Fl. Pak. 157); Babusar P., 4000-4200 m, *Miehe 579* (!); 4300 m, *Miehe 508* (!); Babusar P. NE, 4210 m, *Dickoré 12925* (!); Babusar top, *M. H. Khan 8969* (RAW, Fl. Pak. 157). – Go: Gor, Kahlmimay >, 3870 m, *Nüsser 1101* (B!). – Ra: Fairy Meadows, 3350 m, *Nüsser 960* (B!). — ASTOR: (Cat. Pak.). — ASTOR/SKARDU: Alampi P., 4260 m, *Duthie 12167* (K, Fl. Pak. 157).

3350-4300 m / mont.-alp.: dwarf scrub, rock, scree, turf / NW Himalaya: Gilgit, Astor, Hazara, Kashmir / ENDEM / he.

***Androsace rotundifolia* subsp. *glandulosa* (Hook. f.) Y. Nasir**

CHILAS: Babusar, *M. H. Khan 8971* (RAW, Fl. Pak. 157); *S. Abedin 9043* (KUH, Fl. Pak.

157); *Kemal & M. Qaiser 458* (KUH, Fl. Pak. 157); Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2764* (RAW, Fl. Pak. 157). — ASTOR: Astor Valley, 2130-2430 m, 1892-07-26, *Duthie* (BM, Fl. Pak. 157). — As: Rama, *R. R. Stewart* (Cat. Pak.); Rattu – Gurikot, 2500-2800 m, *F. Schmid 1769* (G, ? also under *A. thomsonii*, Fl. Pak. 157). — Ru: Rupal Valley, *R. R. Stewart* (Cat. Pak.). — ASTOR/KASHMIR: Kamri P., *R. R. & I. D. Stewart 22631a* (RAW, Fl. Pak. 157).

2130-3960 m / submont.-alp. / W Himalaya: Gilgit, Hazara – W Nepal (*A. rotundifolia* subsp. *rotundifolia* also in Baluch., E Afgh.) / W HIM / he.

This taxon appears to be intermediate between subsp. *rotundifolia*, common on the S slope of the Himalaya, and *A. thomsonii* of the N slopes and Karakorum.

Androsace sempervivoides Jacquem. ex Duby (*Primula sempervivoides* (Jacquem. ex Duby) Kuntze)

ASTOR/KASHMIR: Kamri P., 3960-4260 m, *R. R. & I. D. Stewart & E. Nasir 25568* (RAW, Fl. Pak. 157).

3960-4260 m / alp. / W Himalaya: Chitral, Gilgit – Kashmir, Lahul / W HIM / ch.

Androsace septentrionalis L.

CHILAS: Babusar Village, *S. Abedin & M. Qaiser 9024* (KUH, Fl. Pak. 157); 3960 m, *M. A. Siddiqi & Y. Nasir 2763* (RAW, Fl. Pak. 157). — Ra: Raikot Valley, Pungadori, 3300 m, *Nüsser 352* (B!). — ASTOR: (Cat. Pak.). — Da: Rama Ridge N, 3600 m, *Troll 7299*. — Ru: Chungphare Valley, 3500 m, *Troll 7512a*; Latobo, Tap Gl., 3900 m, *Nüsser 59* (B!); upper Rupal Valley, 3600 m, *Troll 7450*. — ASTOR/DEOSAI: Burzil, 4260 m, *R. R. Stewart 19870* (KUH, Fl. Pak. 157); Burzil ascent, *R. R. & I. D. Stewart 19095* (RAW, Fl. Pak. 157). 3300-4260 m / mont.-alp.: sand, scree, turf / Europe, Asia, N America / CIRCPOL / th.

Androsace thomsonii (Watt) Y. Nasir (*A. rotundifolia* var. *thomsonii* Watt)

CHILAS: Babusar Village >, 2850 m, *Dickoré 12828* (!); Babusar, 5 miles <, *Kemal & M. Qaiser 471* (KUH, Fl. Pak. 157). — Go: Gor, 2400 m, *Dickoré 12535* (!); 2690 m, *Schickhoff 1568* (!); Gor > NW, 2600 m, *Dickoré 12578* (!); Gor Gali, 2600-2800 m, *Troll 7107*; Gor, Kahlmaly <, 3210 m, *Nüsser 1125* (B!); Gor, Martal, 2970 m, *Nüsser 1140* (B!); 2970 m, *Nüsser 1128* (B!). — Ra: Bezar Gali <, 3570 m, *Nüsser 926* (B!). — ASTOR: Da: Doian >, 3650-3960 m, 1892-08-14, *Duthie* (G, Fl. Pak. 157). — As: Rama, *Mir Ajab & M. Afzal 464* (ISL, Fl. Pak. 157); Rattu – Gurikot, *F. Schmid 1769* (BM, E, Fl. Pak. 157). — Ru: Latobo, Tap Gl., 3950 m, *Nüsser 53* (B!); Rupal Ridge, 3200-3700 m, *Troll 7471*; Rupal Valley, 3600 m, *Peer 13* (!). — Ka: Rattu nr., 1950-06-30, *A. H. Khan* (PPFI-B, Fl. Pak. 157); Shankargarh, *R. R. Stewart 22757a* (Cat. Pak.).

2400-3960 m / submont.-alp.: meadow, steppe-forest (*Juniperus excelsa*, *Pinus gerardiana*, *Quercus*) / S Karakorum, NW Himalaya: Gilgit, Baltistan / ENDEM / he.

Cortusa brotheri Pax ex Lipsky (*C. himalaica* A. Los., *C. matthioli* sensu Hook. f., non L., *C. matthioli* f. *brotheri* (Pax ex Lipsky) Knuth)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2832* (RAW, Fl. Pak. 157). — Go: Gor > NW, 2950 m, *Dickoré 12645* (!); Gor, Martal, 2970 m, *Nüsser 1136* (B!). — Ra:

Tato – Fairy Meadows, 3060 m, *Nüsser 981* (B!). — ASTOR: Ru: Chungphare Valley, 3500 m, *Troll 7505* (“*C. matthioli*”).

2950–3960 m / mont.-alp.: dwarf scrub, moist, rock, scrub (*Salix karelinii*) / Tian Shan, Pamir, Hindukush, NW Himalaya / PAMIR / he.

Primula denticulata Smith (*P. cachemiriana* Munro, *P. erosa* Drumm., non Wall., *P. harsukhii* Craib)

ASTOR: Ru: Churit >, 3500 m, *Nüsser 761* (B!). — ASTOR/KASHMIR: Kamri P., *R. R. & I. D. Stewart 18704* (RAW, Fl. Pak. 157).

3500 m / subalp. / Himalaya: Afgh. – Assam, SE Tibet / HIMAL / he.

Apparently rare on Nanga Parbat (also in Gilgit proper and Baltistan), much more common on the S slopes of the Himalaya.

Primula duthieana Balf. f. & W. W. Smith (*P. moorcroftiana* var. *flavida* W. W. Smith)

ASTOR/DEOSAI: Burzil P., 3650–3960 m, *Duthie 14031* (BM, E, K, WU, Fl. Pak. 157); 3960 m, *R. R. & I. D. Stewart 19050* (RAW, Fl. Pak. 157); 4260 m, *R. R. & I. D. Stewart 19888* (GH, RAW, Fl. Pak. 157).

3650–4260 m / subalp.-alp.: rivulet, turf / NW Himalaya: Hazara, Kashmir / ENDEM / he. An alpine local endemic along the Himalaya main ridge from Kaghan to Deosai and Kishenganga; closely related to *P. macrophylla*.

Primula elliptica Royle (*P. denticulata* sensu Wight, non Sm., *P. spathulacea* Jacquem. ex Duby)

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12877* (!); Babusar, 7 miles <, *Kemal & M. Qaiser 451* (KUH, Fl. Pak. 157). – Ra: Kosto Valley, 4300 m, *Troll 7724*; Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser 1434* (B!); Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser 1326* (B!); Raikot Valley, Nunatak, 4400 m, *Troll 7768*. — ASTOR: As: Rama Valley, *Lankester & Pearson 1406* (BM, Fl. Pak. 157). — ASTOR/KASHMIR: Kamri P., *R. R. Stewart & E. Nasir 22681* (K, Fl. Pak. 157). — ASTOR/DEOSAI: Burzil, *Koelz 9430* (GH, Fl. Pak. 157); *Koelz 9387* (RAW, Fl. Pak. 157).

4200–4400 m / alp.: dwarf scrub, rock, scree, turf / W Himalaya: Gilgit, Hazara – Uttar Pradesh / W HIM / he.

Primula inayatii Duthie

ASTOR: Da: Astor – Bunji, *F. Schmid 1805* (G, Fl. Pak. 157).

Submont.: cliff, moist, rock / NW Himalaya: Gilgit, Hazara, Kashmir / ENDEM / he.

Primula macrophylla D. Don (*P. nivalis* var. *moorcroftiana* (Wall.) Pax, *P. nivalis* var. *macrophylla* Pax, *P. nivalis* var. *purpurea* (Watt.) Kitam., *P. purpurea* Royle, *P. stuartii* var. *moorcroftiana* Hook. f., *P. stuartii* var. *purpurea* Hook. f.)

CHILAS: Babusar, *Kemal & M. Qaiser 451* (KUH, Fl. Pak. 157); Babusar P., 4000–4200 m, *Miehe 577* (!); Babusar Village, *M. A. Siddiqi & Y. Nasir 2778* (RAW, Fl. Pak. 157). – Pa: Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser 1369* (B!); Pattaro Valley, Guttum Sagar – Kosto Gali, 4720 m, *Nüsser 1394* (B!). – Ra: Bezar Gali, 3900 m, *Troll 7659*; Kosto Valley,

Jiliper High Camp > Ridge, 4200 m, *Nüsser 1316* (B!); Raikot Gl., nunatak, 4550 m, *Nüsser 394* (B!); 4550 m, *Nüsser 396* (B!); Raikot Valley, Bayal, 3600 m, *Peer 44* (!). — ASTOR: As: Chongra Valley, 4260 m, *Lankester & Pearson 1518* (BM, Fl. Pak. 157). — Ru: Mazeno High Camp, ascent, 4600 m, *Nüsser 1494* (B!); upper Rupal Valley, 3500 m, *Troll 7446*. — ASTOR/KASHMIR: Kamri, *R. R. Stewart* (Cat. Pak. “*P. moorcroftiana*”); Kamri P., 3650 m, *Giles* (K, Fl. Pak. 157); 4260 m, *R. R. & I. D. Stewart 21683* (KUH, Fl. Pak. 157). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19884* (Cat. Pak. “*P. moorcroftiana*”); *R. R. & I. D. Stewart 22068a* (RAW, Fl. Pak. 157); *Koelz 9437* (RAW, Fl. Pak. 157); *Koelz 9450* (GH, KUH, RAW, Fl. Pak. 157); *R. R. Stewart 19857* (GH, Fl. Pak. 157); Chillam P., *M. A. Siddiqi & Y. Nasir 4251* (RAW, Fl. Pak. 157).

3500-4720 m / subalp.-subniv.: flushes, gravel, moist, turf, scree / Karakorum, W Himalaya: Afgh. – Bhutan / W HIM / he.

Primula reptans Hook. f. ex Watt (*P. stracheyi* Hook. f. ex Munro)

CHILAS: Ra: Raikot Gl., nunatak, BC, 4000 m, *Troll 7753*. — ASTOR: As: Rama Valley, *Lankester & Pearson 1380* (BM, Fl. Pak. 157).

4000 m / alp.: dwarf scrub, rock, turf (*Kobresia capillifolia*, *Rhododendron anthopogon*) / W Himalaya: Gilgit, Hazara – C. Nepal / W HIM / he.

Very dwarf and possibly overlooked; also in Gilgit proper.

Primula rosea Royle

ASTOR: Ru: Chungphare Valley, 3300 m, *Troll 7503*; Tarishing – Bayals, 2950 m, *Nüsser 788* (B!). — Ka: Kalapani, 3200 m, *Giles 138* (K, Fl. Pak. 157). — ASTOR/KASHMIR: Kamri P., *Giles 136* (K, Fl. Pak. 157). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19903* (GH, RAW, Fl. Pak. 157); *Koelz 9439* (GH, RAW, Fl. Pak. 157).

2950-3300 m / mont.: irrigated meadow, moist, turf / W Himalaya: Afgh. – NW India / W HIM / he.

Primula schlagintweitiana Pax (? *P. farinosa* var. *caucasica* auct., non Regel)

CHILAS: Babusar P., 4320 m, *Miehe 548* (!). — Go: Gor, Kahlmay >, 4050 m, *Nüsser 1097* (B!). — Ra: Raikot Gl., nunatak, BC, 3910 m, *Nüsser 1289* (B!); Raikot Valley, Jut, 3310 m, *Nüsser 946* (B!); Raikot Valley, right slope, 3740 m, *Nüsser 990* (B!). — ASTOR: Da: Harchu Valley, Baro Nirril, 3200-3800 m, *Troll 7288*. — As: Chongra Valley, 4260 m, *Lankester & Pearson 1528* (BM, Fl. Pak. 157); Rama Valley, 4020 m, *Nüsser 170* (B!). — Ru: Upper Rupal Valley, 3500-4000 m, *Troll 7424*. — ASTOR/DEOSAI: Burzil P., 3350 m, *Koelz 9386* (MICH, RAW, Fl. Pak. 157, Cat. Pak. “*P. farinosa*”).

3200-4320 m / mont.-alp.: alluvial fan, turf / SW Karakorum, W Himalaya: Hazara – Kumaon / W HIM / he.

Punicaceae

● ***Punica granatum*** L. / Pomegranate (e)

CHILAS: Go: Darang >, 1450 m, *Dickoré 12697* (!).

1450-1450 m / coll.: moist, rock, semi-desert, scrub / SW Asia, W Himalaya (cultivated N Africa, S Europe, S Asia) / IRAN / np.
Cultivated, possibly also wild.

Pyrolaceae (incl. *Monotropaceae*)

Monotropa hypopitys L. (*Hypopithys lanuginosa* sensu C. B. Clarke, non Nutt., *Monotropa hypopitys* var. *japonica* Franch. & Sav.) / Yellow Bird's-nest (e)

CHILAS: Babusar Valley, 3200 m, *Schickhoff 1712* (!). – Pa: Diamir Valley, 3150 m, *Schickhoff 2455* (!). — ASTOR: Da: Mushkin RH > SE, 2750 m, *Dickoré 12783* (!). – Ru: Zaipur >, 3120 m, *Schickhoff 1084* (!).

2750-3200 m / mont.: forest, moist (*Abies*, *Picea*, *Pinus wallichiana*) / Europe, Asia, N America / CIRC POL / ge.

Orthilia secunda (L.) House (*Pyrola secunda* L., *Ramischia secunda* (L.) Garcke) / Ser-rated Wintergreen (e)

CHILAS: Pa: Diamir Valley, 3150 m, *Schickhoff 2451* (!). – Ra: Fairy Meadows, 3400 m, *Troll 7799*; Raikot Valley, 3560 m, *Schickhoff 1636b* (!). – Bu: Lichar Valley, 3200 m, *Troll 7586*. — ASTOR: Da: Mushkin Forest, 2740-3040 m, *Duthie 12269* (E, Fl. Pak. 128); 3000 m, *Schickhoff 1435* (!); Mushkin RH <, 2580 m, *Dickoré 12732* (!); Mushkin RH > SE, 2700 m, *Dickoré 12758* (!). – As: Rama, *E. Nasir & Webster 6436* (K, RAW, Fl. Pak. 128); 3040 m, *R. R. Stewart & E. Nasir 22877* (K, RAW, Fl. Pak. 128); Rama Valley, Sachen Gl. <, 3220 m, *Schickhoff 967* (!); 3380 m, *Schickhoff 989* (!). – Ru: Chichi Valley, 3200 m, *Troll 7492* (“var. *obtusata*”); Zaipur >, 3140 m, *Schickhoff 1104* (!). — ASTOR/KASHMIR: Kamri P., *R. R. & I. D. Stewart & E. Nasir 21706* (RAW, Fl. Pak. 128); 2890 m, *R. R. & I. D. Stewart 1865* (RAW, Fl. Pak. 128).

2580-3560 m / submont.-subalp.: forest (*Abies*, *Betula*, *Pinus wallichiana*, *Salix walli-chiana*) / Europe, Asia, N America / CIRC POL / ch.

Pyrola rotundifolia subsp. *karakoramica* Krisa / Round-leaved Wintergreen (e)

CHILAS: Babusar Village >, *M. A. Siddiqi & Y. Nasir 2732* (RAW, Fl. Pak. 128). – Pa: Diamir Valley, 3900 m, *Peer 41* (!). – Ra: Kosto Valley, 3950 m, *Nüsser 1449* (B!); Raikot Gl. – Ganalo Gl. confluence, 3890 m, *Nüsser 298* (B!); Raikot Gl., nunatak, 3900 m, *Nüsser 424* (B!); Raikot Valley, 3560 m, *Schickhoff 1636* (!); Raikot Valley, Bezar, 3500 m, *Troll 7649*. — ASTOR: Astor Valley, 3040-3650 m, *Duthie 12452* (E, Fl. Pak. 128). – Da: Mushkin RH > SE, 2700 m, *Dickoré 12757* (!). – As: Gudai, *Duthie 12224* (K, Fl. Pak. 128); Rama, *R. R. Stewart 22878* (K, Cat. Pak., Fl. Pak. 128). – Ru: Chichi Valley, 3200 m, *Troll 7491*. — ASTOR/KASHMIR: Kamri P., 2740 m, *R. R. & I. D. Stewart 18698* (RAW, Fl. Pak. 128). — ASTOR/DEOSAI: Burzil, 3350 m, *Koelz 9388* (RAW, Fl. Pak. 128); Burzil P., *Winterbottom* (Cat. Pak.).

2700-3950 m / mont.-alp.: dwarf scrub, forest, scrub (*Betula*, *Pinus wallichiana*, *Rhododendron anthopogon*, *Salix karelinii*) / SW Karakorum, NW Himalaya: Chitral, Gilgit – Kashmir / W HIM / ch.

Ranunculaceae

Aconitum chasmanthum Stapf ex Holmes (*A. napellus* sensu Hook. f. & Thomson p.p., non L., *A. napellus* var. *hians* P. Brühl) / bishmulo (sh), ban-bal-nag (u)

CHILAS: Babusar P. N, 3700 m, *Dickoré 12863* (!). — ASTOR: Ru: Rupal (Kazmi & Siddiqui 1953); Rupal Valley, Tap, 3560 m, *Nüsser 95* (B!); Tarishing (Kazmi & Siddiqui 1953). — Ka: Kalapani, 3040 m (Kazmi & Siddiqui 1953); 3500 m, *Hansen 73* (!); Kalapani Valley, 3200 m, *Troll 7997* (“var. *nudum*”); Rattu 2740 m, *Duthie 12510* (Stapf 1905); Kalapani 3050-3350 m, *Duthie 12520* (E, Stapf 1905). — ASTOR/KASHMIR: Kamri P. (Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil (Kazmi & Siddiqui 1953).

2740-3700 m / mont.-subalp.: avalanche path, scree / W Himalaya: Chitral – Nepal / W HIM / he.

Medicinal, poisonous.

Aconitum heterophyllum Wall. ex Royle / buma (sh), atis (u)

ASTOR: *Falconer* (K, Stapf 1905); “Gilgit” [probably from Astor?], *Azim & Shaheed* (RAW, “var. *heterophyllum*”, Fl. Pak. 193). — As: Chillam – Gudai, *E. Nasir & Webster* (RAW, “var. *heterophyllum*”, Fl. Pak. 193). — Ru: Rupal Valley, 3010 m (Kazmi & Siddiqui 1953). — Ka: Kalapani, *Giles 664* (Cat. Pak.); 3040 m (Kazmi & Siddiqui 1953); 3500 m, *Hansen 30* (!); Kalapani Valley, 3300 m, *Troll 8016*. — ASTOR/DEOSAI: Burzil (Kazmi & Siddiqui 1953).

3010-3500 m / mont.-subalp.: forb, scrub / W Himalaya: Kashmir – Nepal / W HIM / he.

Medicinal.

Aconitum laeve Royle (*A. lycoctonum* sensu Hook. f. & Thomson, non L.)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2830* (RAW, Fl. Pak. 193). — ASTOR: Ka: Kalapani, 3050-3350 m, *Duthie 12550* (Stapf 1905); 3260 m, *Schickhoff 1202* (!); Kalapani Valley, 3300 m, *Troll 8015*. — ASTOR/DEOSAI: Burzil Chowki, *R. R. Stewart 19753* (RAW, Fl. Pak. 193); Burzil P. (Cat. Pak.).

3050-3960 m / mont.-alp.: forb, forest (*Abies*) / W Himalaya: Kashmir – W Nepal / W HIM / he.

Aconitum rotundifolium Kar. & Kir. (*A. napellus* var. *rotundifolium* (Kar. & Kir.) Hook. f. & Thomson)

CHILAS: Babusar P. N, 3700 m, *Dickoré 12845* (!); Babusar P., 4050 m, *Miehe 451* (!); 4300 m, *Miehe 485* (!). — Pa: Pattaro Valley, Guttum Sagar >, 4450 m, *Nüsser 1339* (B!). — Ra: Raikot Gl., left lateral moraine, 3700 m, *Nüsser 1312* (B!); Raikot Valley, Kilo Sagar, 3900 m, *Troll 7788*; Raikot Valley, Pungadori, 3300 m, *Nüsser 359* (B!). — Bu: Buldar Valley, Mamocha Peak <, 4000 m, *Troll 7877*. — ASTOR: Da: Doian 3350-3660 m, *Duthie* (CAL, E, Stapf 1905). — As: Bulan Ridge, 4100 m, *Nüsser 173* (B!); Sango Sar 3050-3660 m, *Giles 590* (K, Stapf 1905)

3050-4450 m / mont.-alp.: avalanche path, dwarf scrub, scree, turf (*Rhododendron anthopogon*, *Salix karelinii*) / C. Asia, Karakorum, W Himalaya: Kashmir – Nepal / C AS / he.

Aconitum violaceum Jacquem. ex Stapf (*A. napellus* sensu Hook. f. & Thomson p.p., non L.) / tilia-kachang (u)

ASTOR: *Falconer 71* (Stapf 1905: p.p., incl. “var. *robustum*”, Cat. Pak.). — As: Sardar Kothi

(Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil P., 3650-3960 m, *R. R. Stewart 19024* (KUH, RAW, “var. *violaceum*”, Fl. Pak. 193).

3650-3960 m / subalp.-alp. / W Himalaya: Kashmir – Nepal / W HIM / he.

Medicinal, poisonous.

Actaea spicata L. / itshei-ajali (sh), Baneberry (e)

CHILAS: Bu: Muthat, Chwar, 3000 m, *Troll 7841*. — ASTOR: Da: Mushkin RH > SE, 2800 m, *Dickoré 12806* (!). — Ka: Faqirkot, 3100 m, *Schickhoff 1376* (!); Kalapani, 3260 m, *Schickhoff 1248* (!); 3500 m, *Hansen 103* (!). — ASTOR/DEOSAI: Burzil Chowki, 3200 m, *R. R. Stewart 19774* (RAW, Fl. Pak. 193).

2800-3500 m / mont.-subalp.: avalanche path, forest (*Abies*, *Pinus wallichiana*) / Europe, Asia / EURAS / he.

Medicinal, poisonous. The Himalayan plant is var. *acuminata* (Wall. ex Royle) Hara.

Adonis chrysocyathus Hook. f. & Thomson (*A. pyrenaica* sensu Hook. f. & Thomson, non DC.) / jakon-jabatti (sh)

ASTOR: Ka: Faqirkot, 3200 m, *Hansen 71a* (!).

3200 m / mont.: turf / W Himalaya: Kashmir – Nepal / W HIM / he.

Anemone obtusiloba D. Don

ASTOR: (Cat. Pak.). — ASTOR/KASHMIR: Kamri (“var. *potentilloides*”, Cat. Pak.). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19858* (RAW, “var. *obtusiloba*”, Fl. Pak. 193); *R. R. Stewart 19877* (RAW, “var. *obtusiloba*”, Fl. Pak. 193).

Dwarf scrub, turf / Himalaya: Kashmir – Bhutan, S Tibet, Burma / HIMAL / he.

Anemone polyanthes D. Don (*A. narcissiflora* auct., non L.)

ASTOR: Ru: Chichi Valley, 3200 m, *Troll 7484*.

3200 m / mont. / Himalaya: Chitral, Swat, Kashmir – Bhutan, Assam / HIMAL / ge.

Anemone rupicola Cambess.

CHILAS: Ra: Raikot, 3850 m (*Nüsser*); Raikot Valley, 4300 m, *Troll 7717*.

3850-4300 m / subalp.-alp.: rock, scree, turf / Himalaya: SW Karakorum, Chitral – Kashmir – Bhutan, SE Tibet, W China / HIMAL / he.

Anemone tetrasepala Royle

ASTOR: (Cat. Pak.). — Ka: Kalapani Valley, 3300 m, *Troll 8018*. — ASTOR/DEOSAI: Burzil P. (Cat. Pak.); Chillam – Sochar P., 3200 m, *E. Nasir & Webster 6521* (RAW, Fl. Pak. 193).

3200-3300 m / mont. / W Himalaya: Kurram, Swat – Kashmir / W HIM / he.

Aquilegia fragrans Benth.

CHILAS: Pa: Pattaro Valley, Guttum Sagar >, 4450 m, *Nüsser 1332* (B!). — Bu: Lichar Valley, 3300 m, *Troll 7584* (“*A. glauca*”). — ASTOR: (Cat. Pak.). — As: Rama >, 3350 m, *R. R. Stewart & E. Nasir 22904* (RAW, ? also cited under *A. moorcroftiana*, Fl. Pak. 193). — Ru: Rupal Valley, 3600 m, *Peer 5* (!). — Ka: Kalapani, 3260 m, *Schickhoff 1234* (!); Kalapani Valley, 3300 m,

Troll 8010. — ASTOR/DEOSAI: Burzil Chowki, *R. R. Stewart 19759* (RAW, “var. *fragrans*”, Fl. Pak. 193); Chillam Chowki, *R. R. & I. D. Stewart 18971* (RAW, “var. *fragrans*”, Fl. Pak. 193). 3260-4450 m / mont.-alp.: forest (*Abies*) / W Himalaya: Chitral – Kunawar / W HIM / he.

[*Aquilegia moorcroftiana* Wall. ex Royle (*A. kanaorensis* Jacquem., *A. vulgaris* subsp. *viscosa* Hook. f.)]

ASTOR: (Cat. Pak.).

Mont. / SW Karakorum, W Himalaya: Kashmir – Nepal / W HIM / he.

To be expected but unconfirmed, the specimen *R. R. Stewart & E. Nasir 22904* is also cited under *A. fragrans* var. *fragrans*. *A. moorcroftiana* seems to be the most common species of the genus in the SW Karakorum.

Aquilegia nivalis Falc. ex Jackson (*A. vulgaris* subsp. *jucunda* Hook. f. & Thomson)

CHILAS: Ra: Raikot Valley, Bayal, 3580 m, *Nüsser 928* (B!). — ASTOR: *Inayat 25443* (Cat. Pak.). – Da: Rama Ridge N, 3600-3700 m, *Troll 7294* (“*A. jucunda*”). — ASTOR/KASHMIR: Kamri (Cat. Pak.); Kamri P., *R. R. & I. D. Stewart 18721* (RAW, Fl. Pak. 193). — ASTOR/DEOSAI: Burzil, *W. Koelz 9391* (KUH, Fl. Pak. 193); Burzil P. (Cat. Pak.). 3580-3700 m / subalp. / NW Himalaya: Chitral – Kashmir / ENDEM / he.

[*Aquilegia pubiflora* Wall. ex Royle (*A. vulgaris* subsp. *pubiflora* Hook. f. & Thomson)]

CHILAS: Ra: Bezar Gali – Fairy Meadows, 3420 m, *Nüsser 556* (B!, cf.). — ASTOR: Ru: Rupal Valley, Shaigiri – Latobo, 3600 m, *Nüsser 1576* (B!, cf.). 3420-3600 m / subalp. / W Himalaya: Kashmir – Nepal / W HIM / he. Doubtful, specimens may also belong to *A. fragrans*.

Callianthemum pimpinelloides (D. Don ex Royle) Hook. f. & Thomson (*C. cachemiricum* Cambess., *Ranunculus pimpinelloides* D. Don ex Royle)

CHILAS: Go: Gor, Kahlimay >, 4050 m, *Nüsser 1094* (B!). – Ra: Raikot Valley, Kilo Sagar, 4000 m, *Troll 7781*; Raikot Valley, right slope, 3870 m, *Nüsser 984* (B!). 3870-4050 m / subalp.-alp.: scree, turf / Karakorum, Tibet, Himalaya / TIBET / ge.

Caltha alba Cambess. (*C. palustris* auct., non L.) / mamire (u)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2768* (RAW, Fl. Pak. 193). — ASTOR: (Cat. Pak.). – Da: Harchu Valley, Baro Nirril, 3200 m, *Troll 7285*. – Ru: Tarishing, 2910 m, *Nüsser 747* (B!). – Ka: Kalapani, 3040-m (*C. palustris*, Kazmi & Siddiqui 1953). 2910-3960 m / mont.-alp.: flush, moist / NW Himalaya: Chitral – Kashmir / ENDEM / he. Poisonous, dangerous to livestock.

Ceratocephala falcata (L.) Pers. (*Ranunculus falcatus* L.) / jibodajo (sh)

ASTOR: Da: Doian, 2700-3000 m, *Troll 7228*. – As: Kine Das – Nan, 2750 m, *Hansen 219* (!); Los, 2300 m, *Troll 7324*. 2300-3000 m / submont.-mont. / Europe, W & C. Asia / EURAS / th.

Clematis graveolens Lindl.

ASTOR: Da: Dashkin – Mushkin Forest, 2450 m, *Dickoré 12818* (!); Mushkin Forest, RH –

Dashkin, 2660 m, *Nüsser* 263 (B!). – As: Astor, 2310 m (Kazmi & Siddiqui 1953); Astor Bazar, 2400 m, *Troll* 7927 (“var. *acutifolia*”); Gurikot (Kazmi & Siddiqui 1953); Rama Forest (Kazmi & Siddiqui 1953).

2310-2660 m / submont.: hedge on roadside, scrub (*Fraxinus xanthoxyloides*) / W Himalaya: Afgh. – Nepal / W HIM / np.

Medicinal, poisonous.

***Clematis orientalis* L.**

ASTOR: (Cat. Pak.). – As: Gurikot, *R. R. & I. D. Stewart* 18896 (RAW, Fl. Pak. 193); Gurikot – Kirim, *R. R. Stewart & E. Nasir* 21980 (RAW, Fl. Pak. 193).

SE Europe, W & C. Asia, Mongolia, China / C AS / np.

Apparently substituting *C. graveolens* in the drier and higher areas; *C. orientalis* is more common in the Karakorum.

***Clematis sibirica* Mill. (*C. alpina* var. *sibirica* (L.) Kuntze, *Atragene sibirica* L.)**

CHILAS: Bu: Buldar Valley, 3200 m, *Troll* 7598 (“*C. robertsiana*”).

3200 m / mont. / N Europe, N Asia, Tian Shan, Kongur, SW Karakorum: Gilgit, Baltistan / EURAS / np.

C. robertsiana is usually considered endemic to the Kurram Valley, typical *C. sibirica* and specimens probably identical with Troll’s occur in the SW Karakorum.

***Delphinium brunonianum* Royle (*D. jacquemontianum* Cambess., *D. moschatum* Munro)**

CHILAS: Babusar P. NE, 4210 m, *Dickoré* 12871 (!). – Ra: Raikot Gl., nunatak, 4200 m, *Nüsser* 380 (B!); 4550 m, *Nüsser* 397 (B!).

4200-4550 m / alp.-subniv.: dwarf scrub, rock, scree, turf / Pamir, Karakorum, Tibet, Himalaya / TIBET / he.

***Delphinium cashmerianum* Royle (*D. aitchisonii* Huth)**

CHILAS: Babusar P., 4050 m, *Miehe* 446 (!). — ASTOR/KASHMIR: Kamri P., *R. R. & I. D. Stewart* 18723 (KUH, Fl. Pak. 193). — ASTOR/DEOSAI: Chillam – Sochar P., *E. Nasir & Webster* 6524 (RAW, Fl. Pak. 193).

4050 m / alp.: scree, turf / W Himalaya: Hazara – Kashmir, NW India / W HIM / he.

[*Delphinium crassifolium* Schrad. ex Spreng.]

ASTOR: Ka: Kalapani – Kamri P., 3500-4000 m, *Troll* 8063.

3500-4000 m / subalp.-alp.

Probably referable to *D. pyramidale*.

***Delphinium pyramidale* Royle (*D. ranunculifolium* Wall. ex Hook. f. & Thomson, *D. speciosum* subsp. *ranunculifolium* (Wall.) Brühl & King, *D. speciosum* var. *pyramidale* (Royle) Mukerjee)**

ASTOR: Ka: Kalapani, 3040 m (Kazmi & Siddiqui 1953). — ASTOR/KASHMIR: Kamri P. (Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil Valley, *Osmaston* 78 (Cat. Pak.).

3040 m / mont. / W Himalaya: Kashmir – Nepal / W HIM / he.

[*Delphinium trollii* ined.]

CHILAS: Pa: Pattaro Valley, Zangal, 2400-2600 m, *Troll* 7681.

2400-2600 m / submont.

A manuscript name; plant of unknown identity.

Delphinium vestitum Wall. ex Royle (*D. rectivenium* Royle, *D. vestitum* var. *sphenolobum* Brühl ex Huth)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir* 2805 (RAW, Fl. Pak. 193); 3960 m, *S. Abedin & M. Qaiser* 9035 (KUH, Fl. Pak. 193); 3960 m, *M. A. Siddiqi & Y. Nasir* 2808 (RAW, Fl. Pak. 193); 3960 m, *Azim & Shaheed* (RAW, Fl. Pak. 193); 3960 m, *M. A. Siddiqi & Y. Nasir* 4106 (RAW, Fl. Pak. 193).

3960 m / alp. / W Himalaya: Kashmir – Nepal / W HIM / he.

[*Delphinium viscosum* Hook. f. & Thomson]

CHILAS: Bu: Buldar Valley, Mamocho Peak <, 4600 m, *Troll* 7869.

4600 m / subniv. / he.

An E Himalayan species; probably a misidentification.

Isopyrum anemonoides Kar. & Kir. (*I. uniflorum* Aitch. & Hemsley)

CHILAS: Bu: Buldar Valley, Mamocho Peak <, 4000 m, *Troll* 7868.

4000 m / alp. / Tian Shan, Pamir, SW Karakorum, NW Himalaya; E Tibet / CAS / ge.

Occasionally found also in adjacent Gilgit.

Paraquilegia anemonoides (Willd.) Ulbr. (*Aquilegia anemonoides* Willd., *Isopyrum grandiflorum* Fisch. ex DC.)

CHILAS: Babusar P., 4300 m, *Miehe* 504 (!). — ASTOR/KASHMIR: Kamri P., *R. R. & I. D. Stewart* 22715a (RAW, Fl. Pak. 193). — ASTOR/DEOSAI: Burzil, 3350 m, *W. Koelz* 9389 (RAW, Fl. Pak. 193).

3350-4300 m / mont.-alp. / Altai, Tian Shan, Pamir, Afgh., Karakorum, Himalaya, E Tibet / CAS / ch.

Pulsatilla wallichiana (Royle) Ulbr. (*Anemone wallichiana* Royle, *A. albana* sensu Hook. f. & Thomson, non Steven, *P. duthiei* Gandoger)

CHILAS: Go: Gor, 3520 m, *Schickhoff* 1474 (!); Gor, Kahlimay >, 3670 m, *Nüsser* 1113 (B!).

– Ra: Raikot Valley, 3560 m, *Schickhoff* 1650 2 (!, cf.). — ASTOR: Da: Harchu Valley, 3200 m, *Troll* 7297; 3500 m, *Nüsser* 849 (B!). – As: Astor – Rama, *R. R. Stewart & E. Nasir* 21874 (RAW, Fl. Pak. 193); Rama (Cat. Pak.); Rama Valley, 4020 m, *Nüsser* 172 (B!). –

Ru: Latobo S, 3950 m, *Nüsser* 69 (B!); upper Mazeno BC, 4320 m, *Nüsser* 1472 (B!).

3200-4320 m / mont.-alp.: alluvial fan, forest, scrub (*Betula*) / SW Karakorum, W Himalaya: Chitral – NW India / W HIM / he.

[*Ranunculus chaerophyllos* L.]

ASTOR: Ru: Tarishing, *Winterbottom* 736 (Cat. Pak.).

N Africa, S Europe, SW Asia; W Pakistan: Chitral, Peshawar / IRAN / ge.

Doubtful, specimen may refer to *R. rubrocalyx*.

Ranunculus diffusus DC. / jibedaji (sh)ASTOR: Ka: Faqirkot, 2700 m, *Hansen 38* (!); 2700 m, *Hansen 187* (!).

2700 m / mont. / Himalaya: Swat, Kashmir – SE Tibet, Assam, N Burma, China / HIMAL / he.

Ranunculus hirtellus RoyleCHILAS: Go: Gor, Martal, 2930 m, *Nüsser 1084* (B!). — ASTOR: Da: Doian, 2800-3300 m, *Troll 7224*; 3000 m, *Troll 7563*; Doian Ridge, 3800 m, *Troll 7570*. – As: Gudai, 2600 m, *Troll 7040*. – Ka: Kalapani, 3260 m, *Schickhoff 1223* (!); 3500 m, *Hansen 96* (!).— ASTOR/DEOSAI: Burzil P., R. R. & I. D. Stewart 19097 (RAW, Fl. Pak. 193).2600-3800 m / submont.-subalp.: forest (*Abies, Picea*) / Himalaya: Kashmir – Sikkim, SE Tibet, W China / HIMAL / he.***Ranunculus jacquemontii*** Riedl

ASTOR/KASHMIR: Kamri, 3040 m, R. R. Stewart & E. Nasir 22720 (RAW, Fl. Pak. 193).

3040 m / mont. / W Himalaya: Astor, Kashmir – Kunawar / W HIM / he.

Ranunculus karakoramicola TamuraCHILAS: Go: Gor, Kahlimay >, 3680 m, *Nüsser 1112* (B!). – Pa: Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser 1382* (B!); 4490 m, *Nüsser 1381* (B!). – Ra: Fairy Meadows, 3390 m, *Nüsser 950* (B!); Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser 1317* (B!); 4200 m, *Nüsser 1325* (B!); Raikot Gl., nunatak, BC, 3990 m, *Nüsser 466* (B!); Raikot Valley, Pungadori, 3300 m, *Nüsser 921* (B!). — ASTOR: As: Rama Valley, 3550 m, *Nüsser 160* (B!); 3780 m, *Nüsser 166* (B!).

3300-4490 m / mont.-alp.: alluvial fan, moist / SW Karakorum, NW Himalaya / ENDEM / he.

Ranunculus laetus Wall. ex Hook. f. & Thomson (*R. pathanorum* Rech. f., *R. pseudo-laetus* Tamura) / bezamik (sh)CHILAS: Babusar Valley, Jal – Nagat, 2050 m, *Dickoré 12821* (!). – Go: Gor, Ranote, 2120 m, *Nüsser 1200* (B!). — ASTOR: As: Los, 2400 m, *Troll 7326*. – Ru: Rupal Valley, 3140 m, *Nüsser 124* (B!, cf.); 3140 m, *Nüsser 127* (B!); Rupal Valley, Bayals, 3160 m, *Nüsser 582* (B!, cf.); Tarishing, 2910 m, *Nüsser 755* (B!, cf.); 2910 m, *Nüsser 577* (B!); vil-lage Lower Rupal, 3100 m, *Nüsser 1588* (B!). – Ka: Rattu, 2700 m, *Troll 7954*. — ASTOR/DEOSAI: Burzil Chowki, R. R. Stewart 19743 (RAW, Fl. Pak. 193).

2050-3160 m / submont.-mont.: flush, meadow / C. Asia, Himalaya: Afgh. – SE Tibet, W China / C AS / he.

[*Ranunculus meinshausenii* Schrenk]ASTOR: As: Rama Ridge S, 3200-3600 m, *Troll 7304*. – Ru: Rupal Ridge, 3700 m, *Troll 7470*.

3200-3700 m / mont.-subalp.

Of unknown identity.

Ranunculus munroanus Drumm. ex DunnCHILAS: Babusar P., 4050-4100 m, *Miehe 469* (!).

4050-4100 m / alp.: turf / W Himalaya: Swat – Kashmir / ENDEM / he.

Ranunculus natans C. A. Mey. (*R. hyperboreus* var. *natans* (C. A. Mey.) Regel) / kushe (sh)

ASTOR: As: Rama, *R. R. Stewart* 22875 (Cat. Pak.); *R. R. Stewart & E. Nasir* 21875 (RAW, Fl. Pak. 193); [?]Waylari, *Winterbottom* 514 (“*R. hyperboreus* var. *multifidus*”, Cat. Pak.). – Ru: Bazhin Lake, 3520 m, *Nüsser* 2 (B!); Rupal Valley, Tap, 3460 m, *Nüsser* 745 (B!); Tap, 3500 m, *Troll* 7400. – Ka: Rattu, 2700 m, *Troll* 7950. — ASTOR/KASHMIR: Kamri, 1954-06-26, *R. R. Stewart & E. Nasir* (RAW, Fl. Pak. 193). 2700-3520 m / mont.-subalp. / Siberia, Mongolia, Altai, Tian Shan, Pamir, Himalaya: Afgh. – Nepal / C AS / he.

Ranunculus rubrocalyx Regel ex Kom. (*R. hirtellus* auct., non Royle)

CHILAS: Babusar P. N, 3700 m, *Dickoré* 12852 (!); Babusar P. NE, 4210 m, *Dickoré* 12924 (!). — ASTOR: As: [?]Rattu – Gurikot, *F. Schmid* 1766 (RAW, “*R. pangiensis*”, Cat. Pak.; Fl. Pak. 193, “*R. chaerophyllum*”). – Ru: Toshain Valley, ascent to Mazeno Gali, 5300 m, *Nüsser* 1516 (B!). 3700-5300 m / subalp.-subniv.: avalanche path, dwarf scrub, rock, scree, turf / Tian Shan, Pamir, W Himalaya: Afgh., Chitral – Kashmir / PAMIR / he.

Ranunculus trichophyllus Chaix (*Batrachium trichophyllum* (Chaix) Van der Bosche) / Thread-leaved Water-crowfoot (e)

ASTOR: As: Gurikot (Kazmi & Siddiqui 1953). – Ka: Rattu, 2740 m (Kazmi & Siddiqui 1953); 2800 m, *Miehe* 950403 (!). 2740-2800 m / Europe, N Africa, Asia, N America / CIRCPOLE / he.

Thalictrum alpinum L. / Alpine Meadow-rue (e)

CHILAS: Pa: Pattaro Valley, 4500 m, *Troll* 7736. – Ra: Fairy Meadows, 3350 m, *Nüsser* 959 (B!). 3350-4500 m / mont.-subniv.: turf / Europe, Asia, N America / CIRCPOLE / he.

[*Thalictrum cultratum* Wall.]

ASTOR: Ka: Kalapani Valley, 3300 m, *Troll* 8013. 3300 m / mont. / Himalaya: Kashmir – Bhutan, SE Tibet, W China / HIMAL / he. Record may be referable to *Th. platycarpum*.

Thalictrum foetidum L.

CHILAS: Babusar Village, *M. A. Siddiqi & Y. Nasir* 2827 (RAW, Fl. Pak. 193). — ASTOR/KASHMIR: Gudai – Gurais, *R. R. & I. D. Stewart* 4283 (RAW, Fl. Pak. 193). — ASTOR/DEOSAI: Burzil <, *R. R. Stewart* 19755 (RAW, Fl. Pak. 193); Burzil Chowki <, *R. R. Stewart* 1955a (KUH, Fl. Pak. 193). Europe, Asia / EURAS / he. Rather common from SW Karakorum to Ladakh & Zaskar.

[*Thalictrum foliolosum* DC.]

CHILAS: Babusar, *M. A. Siddiqi & Y. Nasir* 2827 (RAW, ? also cited under *T. foetidum*, Fl. Pak. 193).

Himalaya: Kashmir – SE Tibet, N Burma / HIMAL / he.

Perhaps a form of *Th. foetidum*.

Thalictrum platycarpum Hook. f. & Thomson (*Th. cultratum* subsp. *platycarpum* (Hook. f. & Thomson) Brühl)

ASTOR/KASHMIR: Kamri, R. R. Stewart & E. Nasir 22723a (RAW, Fl. Pak. 193); R. R. Stewart & E. Nasir 22722 (RAW, Fl. Pak. 193); Kamri Camp, R. R. Stewart 22722 (Cat. Pak.).

W Himalaya: Kashmir – Nepal / W HIM / he.

Trollius acaulis Lindl.

CHILAS: Babusar, M. A. Siddiqi & Y. Nasir 2828 (RAW, Fl. Pak. 193). — ASTOR: Da: Harchu Valley, 3540 m, *Nüsser 835* (B!, cf.); Rama Ridge N, 3600-3700 m, *Troll 7295*. — As: Gurikot Valley, 3800 m, *Troll 7520*. — ASTOR/KASHMIR: Kamri (Cat. Pak.). — ASTOR/DEOSAI: Burzil, W. Koelz 9447 (RAW, Fl. Pak. 193); Burzil P. (Cat. Pak.).

3540-3800 m / subalp. / W Himalaya: Kashmir – Nepal / W HIM / he.

Rhamnaceae

Rhamnella gilgitica Mansf. & Melch.

CHILAS: Go: Gor, 2300 m, *Troll 7157*; 2420 m, *Dickoré 12652* (!, veg.); Thelichi – Gor Gali, 1600-2200 m, *Troll 7093* (B; holotype, destroyed). — Pa: Diamir Valley, 1700 m, *Schickhoff 2613* (!); Pattaro Valley, Zangal, 2450 m, *Troll 7680* (B; isotype, destroyed). 1600-2450 m / coll.-submont.: rock, scrub, steppe-forest (*Quercus*) / Indus Valley: Palas, Chilas, Gor; Gilgit / ENDEM / np.

Known from a few localities along the upper Indus only: Palas Valley, R. Rafiq (!), Nanga Parbat area, Gilgit, Shinghai Gah, *Miehe* (!), Kar Gah, *Peer* (!); heavily browsed by goats, mutilated vegetative specimens are difficult to distinguish from *Sageretia thea* (Fig. 10).

Rhamnus prostrata Jacquem. ex Parker (*R. persica* sensu Lawson, non Boiss.)

ASTOR: (Cat. Pak.).

Iran, Afgh., Pamir, Karakorum, W Himalaya: Chitral – Garhwal / IRAN / ch.

Sageretia thea (Osbeck) M. C. Johnston

CHILAS: Go: Darang >, 1550 m, *Dickoré 12683* (!); Gor, 1400-1600 m (*Dickoré*); Gor, Hapareng, 1950 m, *Nüsser 1207* (B!). — Bu: Muthat – Raikot Bridge, 2320 m, *Nüsser 1052* (B!). — ASTOR: Da: Doian, 1780-2080 m (*Dickoré*); Ramghat, 1700 m, *Troll 7199*.

1400-2320 m / coll.-submont.: rock, semi-desert (*Heliotropium dasycarpum*, *Pistacia khinjuk*, *Stipagrostis plumosa*) / Afgh., Pakistan, India, China / HIMAL / np.

The specimens are referable to subsp. *thea*, whereas subsp. *brandrethiana* (Aitch.) Zilinsky occurs in the foothill zone.

Rosaceae

Agrimonia pilosa Ledeb. (*A. eupatoria* auct., non L.)

ASTOR: Da: Doian, 2500 m, *Troll 7904*; Mushkin RH – Turbaling, 2620 m, *Dickoré 12751* (!).

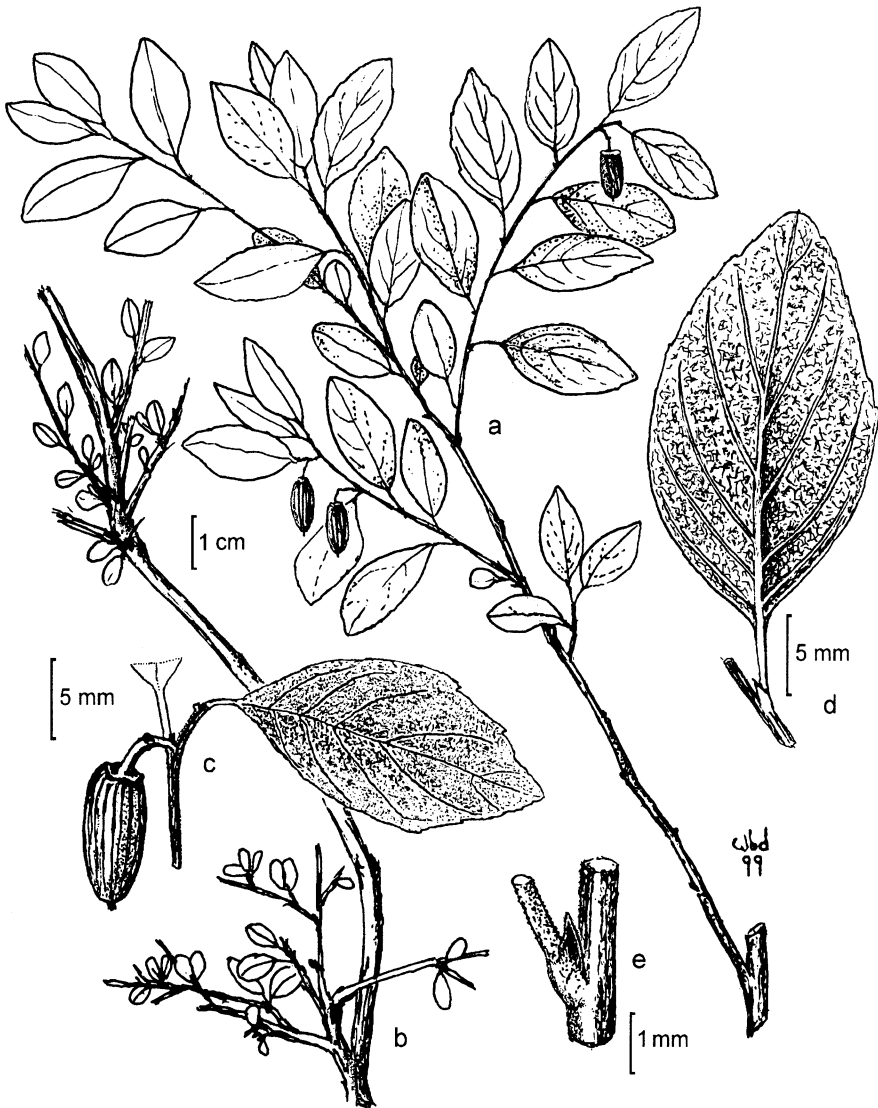


Fig. 10. *Rhammella gilgitica* – a: fruiting twig, b: small leaved vegetative branch, mutilated by browsing (most specimens seen from Nanga Parbat are in this state), c: fruit, d: leaf, abaxial surface, e: petiole base, stipule (all drawn from Gilgit, Shinghai Gah – Pahot Gali, 2150-2300 m, 1990-08-06, Miede 1786).

2500-2620 m / submont.: forest, meadow, moist (*Pinus wallichiana*, *Salix wallichiana*) / C. Asia, W Himalaya: Afgh. – SE Tibet, W China / C AS / he.

Alchemilla trollii Rothm.

ASTOR: As: Gurikot Valley, 3400 m, *Troll 7525*.

3400 m / subalp. / SW Karakorum, NW Himalaya / ENDEM / he.

Alchemilla ypsilotoma Rothm.

ASTOR/KASHMIR: Kamri P., R. R. *Stewart 18665* (Cat. Pak.). — ASTOR/DEOSAI: Burzil P., R. R. *Stewart 19069* (Cat. Pak.).

Alp.: meadow / Astor, Kashmir / ENDEM / he.

Cotoneaster affinis Lindl. (*C. bacillaris* Wall. ex Lindl., *C. rosea* Edgew.)

ASTOR: Da: Harchu Valley, Lathang, 2600 m, *Nüsser 820* (B!, cf.); Mushkin RH <, 2580 m, *Dickoré 12711* (!).

2580-2600 m / submont. / Himalaya: Kashmir – Bhutan, SE Tibet, W China / HIMAL / np. Synonymy tentative.

[*Cotoneaster integerrima* Medik. (*C. vulgaris* sensu Hook. f.)]

ASTOR: (Cat. Pak.).

Europe, W Asia; W Karakorum / EURAS / ch.

Doubtful, but appears to be rather common in adjacent SW Karakorum.

[*Cotoneaster microphylla* Wall. ex Lindley / khariz, luni (u)]

ASTOR: Ka: Rattu, 2740 m (Kazmi & Siddiqui 1953).

2740 m / Himalaya / HIMAL / ch.

Medicinal. Record from the area probably based upon misidentification, though the species is common in the Outer Himalaya.

Cotoneaster nummularia Fisch. & C. A. Mey. (? *C. lindleyi* Steud., ? *C. minuta* Klotz, *C. racemiflora* var. *kotschyi* C. K. Schneider, *C. racemiflora* var. *royleana* Dipp.)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1756* (!). – Go: Gor, 2160-2650 m (*Dickoré*); 2690 m, *Schickhoff 1586* (!); Gor > NW, 2600 m, *Dickoré 12575* (!). — ASTOR: (Cat. Pak.). – Da: Doian – Turbaling, 2380-2600 m (*Dickoré*); Mushkin Forest, 2580 m, *Schickhoff 1139* (!). – As: Gurial, 2800 m, *Hansen 191* (!); Gurikot – Das Kirim, R. R. *Stewart 22909* (“*C. lindleyi*”, Cat. Pak.). – Ka: Faqirkot, 2800 m, *Hansen 112* (!, cf.); 3000 m, *Hansen 186* (!); Rattu, R. R. *Stewart 22810* (“*C. lindleyi*”, Cat. Pak.).

2160-3000 m / submont.-mont.: forest, steppe-forest (*Pinus gerardiana*, *Pinus wallichiana*, *Quercus*) / SE Europe, SW Asia: Turkey – Tian Shan, Pamir, SW Karakorum, W Himalaya / IRAN / np.

Crataegus songarica C. Koch (*C. fischeri* C. K. Schneider, *C. monogyna* auct., non Jacq., *C. oxyacantha* auct., non L., *C. oxyacanthoides* Thuill.)

ASTOR: (Cat. Pak.). – Da: Astor <, opp. Parishing Gah, 2300 m, *Dickoré 12816* (!); Dashkin

– Astor, 2090 m (*Dickoré*); Doian – Mushkin, 2000-2500 m, *Troll* 7267 (“*Crataegus?*”). – As: Los, 2300 m, *Troll* 7325 (“*C. monogyna*”).
2000-2500 m / submont. / Iran, Afgh., Tian Shan, Pamir, W Himalaya / IRAN / np.

Dasiphora dryadanthoides Juz. (*Potentilla fruticosa* var. *pumila* Hook. f., *P. dryadanthoides* (Juz.) Viroshilov)

CHILAS: Babusar P., 4000-4200 m, *Miehe* 572 (!). – Ra: Raikot Valley, 4300 m, *Troll* 7718 (“*Potentilla arbuscula* var. *pumila*”); Raikot Valley, Kilo Sagar, 4000 m, *Troll* 7784a (“*Potentilla arbuscula* var. *pumila*”).

4000-4300 m / alp. / Pamir, Karakorum, Tibet, Himalaya / TIBET / ch.

Dasiphora parvifolia (Fisch. ex Lehm.) Juz. (*Potentilla parvifolia* Fisch. ex Lehm.)

ASTOR: Ka: Faqirkot, 2900 m, *Hansen* 201 (!).

2900 m / mont. / SW Karakorum, W Himalaya / W HIM / np.

Fragaria nubicola Lindl. ex Lacaita (*F. vesca* var. *nubicola* Lindl. ex Hook. f.) / bourousse, burusé (sh)

CHILAS: Babusar Valley, 3200 m (*Schickhoff* 1706). – Go: Gor, 3000-3500 m, *Troll* 7146; 3230 m (*Schickhoff* 1522); Gor > NW, 2770 m, *Dickoré* 12595 (!); Gor, Martal, 2930 m, *Nüsser* 1077 (B!); 2970 m, *Nüsser* 1130 (B!). – Pa: Diamir Valley, 3150 m, *Schickhoff* 2453 (!); Pattaro Valley, 3570 m, *Nüsser* 1353 (B!). – Ra: Fairy Meadows, 3310 m, *Nüsser* 368 (B!); Raikot Valley, 3220 m (*Schickhoff* 1658); 3230 m, *Schickhoff* 1603 (!); Raikot Valley, Pungadori, 3300 m, *Nüsser* 925 (B!). — ASTOR: Da: Harchu Valley, Baro Nirril >, 3120 m, *Nüsser* 886 (B!); Mushkin Forest, 2580 m (*Schickhoff* 1116); 2900 m (*Schickhoff* 1382); 3000 m (*Schickhoff* 1414); Mushkin Forest, RH, 2700 m, *Nüsser* 253 (B!). – As: Rama, 3100 m, *Hansen* 47 (!); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff* 1009 (!); 3220 m, *Schickhoff* 968 (!). – Ru: Chichi Valley, 3050 m, *Nüsser* 140 (B!). – Ka: Faqirkot, 2980 m (*Schickhoff* 1320); *Kalapani*, 3260 m, *Schickhoff* 1203 (!); Kalapani Valley, 3300 m, *Troll* 8020.

2580-3570 m / submont.-subalp.: forest, steppe-forest (*Abies*, *Cedrus*, *Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / Himalaya: Afgh. – N Burma, W China / HIMAL / he.

Geum elatum G. Don (*Acomastylis elata* Bolle, *G. elatum* Wall., *Sieversia elata* Royle) / goglimool (u)

ASTOR/KASHMIR: Kamri P., 4000 m, *Troll* 8061. — ASTOR/DEOSAI: Burzil (Kazmi & Siddiqui 1953).

4000 m / alp. / Himalaya: Kashmir – Sikkim, SE Tibet / HIMAL / he.

Medicinal.

● ***Malus domestica*** Borkh. / chirko phalo, ka ashpi, phala (sh), Apple (e)

ASTOR: Da: Doian, 1780 m (*Dickoré*). – As: Sakamel, 3000 m, *Hansen* 159 (!, cf.). – Ka: Faqirkot, 2700 m, *Schickhoff* 1379 (!); 2800 m, *Hansen* 115 (!).

1780-3000 m / mont.: river terrace / cultivated / ph.

Potentilla agrimonioides M. Bieb. (*P. sericea* auct., non L.)

CHILAS: Ra: Raikot Valley, Jut, 3330 m, *Nüsser* 936 (B, det. Soják !); Raikot Valley,

Pungadori, 3300 m, *Nüsser 351* (B, det. Soják !). — ASTOR: Da: Doian, *Duthie 12472* (“*P. sericea*”, Cat. Pak.); Doian – Muthat, 3500 m, *Troll 7605* (“*P. sericea*”).
3300-3500 m / mont. / Caucasus, Iran, Afgh., Pamir, Karakorum, W Himalaya, SW Tibet / IRAN / he.

Potentilla atosanguinea Lodd. (*P. argyrophylla* var. *atosanguinea* Hook. f.)
ASTOR/KASHMIR: Kamri P., *R. R. Stewart 22683* (“var. *cataclines*”, Cat. Pak.).
W Himalaya: Chitral – Nepal / W HIM / he.

Potentilla bifurca subsp. ***orientalis*** (Juz.) Soják (*P. moorcroftii* Wall. ex Lehm.)
ASTOR: As: Chillam, *R. R. Stewart 18970* (Cat. Pak.).
E Europe, W & C. Asia, Tibet / C AS / he.
Very common in adjacent Karakorum.

[*Potentilla conferta* Bunge]

ASTOR: Da: Doian Ridge, 3600 m, *Troll 7572*.
3600 m / subalp. / An exclusively Siberian species, identity uncertain.

Potentilla curviseta Hook. f.
ASTOR: Ka: Kalapani – Kamri P., 3700 m, *Troll 8073*.
3700 m / subalp. / NW Himalaya (Astor – Kashmir, ?Himachal Pradesh) / ENDEM / ch.

Potentilla desertorum Bunge (*P. arnavatensis* (Th. Wolf) Th. Wolf ex Juz.)
CHILAS: Babusar Village, *M. A. Siddiqi 2775* (Cat. Pak.). – Ra: Raikot Gl., nunatak, 3880 m, *Nüsser 439* (B, det. Soják !, “var. *arnavatensis*”); Raikot Gl., nunatak, BC, 3990 m, *Nüsser 1301* (B, det. Soják !); Raikot Valley, Batharet, 3400 m, *Nüsser 1001* (B, det. Soják !). —
ASTOR: Da: Harchu Valley, Baro Nirril >, 3120 m, *Nüsser 885* (B, det. Soják !). – Ru: Rupal Valley, lower Mazeno BC moraine, 4050 m, *Nüsser 1529* (B, det. Soják !). – Ka: Kalapani, 3260 m, *Schickhoff 1229* (!).
3120-4050 m / mont.-alp.: forest, scrub (*Abies*, *Cedrus*) / Altai, Tian Shan, Pamir, Afgh., Karakorum, W Himalaya / C AS / he.

Potentilla doubjonneana Cambess.
CHILAS: Babusar P., 4050 m, *Miehe 452* (! det. Soják).
4050 m / alp. / Himalaya: Chitral – Kashmir / W HIM / he.

Potentilla gelida subsp. ***borissii*** (Ovcz. & Koczk.) Soják
CHILAS: Babusar Village, *M. A. Siddiqi 2869* (Cat. Pak., “*P. gelida*”); Babusar P., 4300 m, *Miehe 493* (! det. Soják); 4320 m, *Miehe 571* (! det. Soják). – Ra: Raikot Valley, 3950 m, *Troll 7627* (*P. gelida*); Raikot Valley, Nunatak, 4400 m, *Troll 7759* (“*P. gelida*”); Raikot Gl., nunatak, BC, 3910 m, *Nüsser 1294* (B, det. Soják !). — ASTOR: Ru: Mazeno High Camp, ascent, 4770 m, *Nüsser 1513* (B, det. Soják !); Sharsingi Ridge, 4200 m, *Troll 7509* (“*P. gelida*”); upper Rupal Valley, 3600 m, *Troll 7443* (“*P. gelida*”).
3600-4770 m / subalp.-subniv. / Tian Shan, Pamir, Karakorum, W Himalaya (*P. gelida* subsp. *gelida*: Caucasus, Tian Shan, Mongolia, Siberia) / PAMIR / he.

Potentilla gerardiana Lindl. ex Lehm. (*P. fragarioides* Hook. f., non L.)ASTOR: (Cat. Pak.). – As: Gurikot, Kine Das, 2550 m, *Troll 7358*.

2550 m / submont. / W Himalaya: Kurram, Chitral – Uttar Pradesh / W HIM / he.

Potentilla monanthes Wall. ex Lehm.CHILAS: Pa: Pattaro Valley, 3800 m, *Troll 7705* (“*P. menantha*”).

3800 m / subalp. / Himalaya, W China / HIMAL / he.

Apparently rare, to be confirmed.

Potentilla multifida L.ASTOR: As: Gurikot, 2500 m, *Troll 7537*; Rama Valley, 3180 m, *Nüsser 894* (B, det. Soják !, cf.). – Ru: Latobo, Tap Gl., left lateral moraine, 3600 m, *Nüsser 36* (B, det. Soják !, “non typica”).

2500-3600 m / submont.-subalp. / Europe, Asia, N America / CIRC POL / he.

Potentilla pamirica WolfCHILAS: Babusar P., 4300 m, *Miehe 563* (*P. pamirica* × *sino-nivea*, det. Soják !).

4300 m / alp.: open cushions / Tian Shan, Pamir, Hindukush, Karakorum, Kunlun Shan, W Tibet / PAMIR / he.

Potentilla supina subsp. *costata* Soják

ASTOR/DEOSAI: Burzil (Kazmi & Siddiqui 1953).

C. & E Asia (*P. supina* subsp. *supina*: Europe, Asia, N America) / C AS / th.

Medicinal.

Potentilla turczaninowiana Stschegl.CHILAS: Ra: Raikot Gl., nunatak, BC, 3970 m, *Nüsser 474* (B, “subsp. *nephogena*”, det. Soják !); Raikot Gl., nunatak, 4550 m, *Nüsser 395* (B, det. Soják !); Raikot Valley, Pungadori, 3300 m, *Nüsser 922* (B, det. Soják !). — ASTOR: Da: Harchu Valley, Baro Nirril >, 3200 m, *Nüsser 871* (B, det. Soják !). – As: Rama Valley, 3700 m, *Nüsser 161b* (B!).

3200-4550 m / mont.-subniv.: alluvial fan, forest / Tian Shan, Pamir, Karakorum, Himalaya, Yunnan / C AS / he.

According to Soják (1988) possibly all specimens refer to subsp. *nephogena* Soják, which differs from the glabrous type only in being somewhat hairy.***Potentilla venusta*** Soják (*P. argyrophylla* var. *leucochroa* (Lindl.) Hook. f.)CHILAS: Go: Gor, 3520 m, *Schickhoff 1482* (!); Gor, Kahlimay, 3610 m, *Nüsser 1093* (B, det. Soják !); Gor, Kahlimay >, 3650 m, *Nüsser 1114* (B, det. Soják !); 3770 m, *Nüsser 1104* (B, det. Soják !). – Pa: Pattaro Valley, Guttum Sagar, 4260 m, *Nüsser 1361* (B, det. Soják !); 4320 m, *Nüsser 1363* (B, det. Soják !). – Ra: Raikot Valley, Bayal, 3600 m, *Nüsser 1271* (B, det. Soják !). — ASTOR: As: Bulan Ridge, 4180 m, *Nüsser 179* (B, det. Soják !); Gurikot Valley, 4200 m, *Troll 7512* (“*P. argyrophylla*”). – Ru: Latobo S, 4410 m, *Nüsser 74* (B, det. Soják !); Rupal Valley, Nagachakali, nunatak, 3620 m, *Nüsser 614* (B, det. Soják !); 3620 m, *Nüsser 643* (B, det. Soják !); 3620 m, *Nüsser 641* (B, det. Soják !); upper Mazeno

BC, 4320 m, *Nüsser 1457* (B, det. Soják !); upper Rupal Valley, 3500-4000 m, *Troll 7440* (“*P. argyrophylla*”).

3500-4410 m / subalp.-alp.: dwarf scrub, flushes, moraine, meadow, scrub, turf (*Rhododendron anthopogon*, *Salix karelinii*) / SW Karakorum, Himalaya / HIMAL / he.

Prunus amygdalus Batsch (*Amygdalus communis* L., *P. amygdalus* Baill.) / kune (sh), jungli badam (u), Almond (e)

ASTOR: Da: Astor – Harchu, 2000-2400 m, *Troll 7923*. – As: Chongra – Kachik, 2100 m, *Hansen 198* (!).

2000-2400 m / submont. / SE Europe, SW Asia / IRAN / ph.

Possibly indigenous.

● ***Prunus armeniaca*** / juroti (sh), Apricot (e)

CHILAS: Go: Thelichi, 1400 m (*Nüsser*).

1400 m / ph.

Cultivated on a small scale.

● ***Prunus avium*** / gilal (sh), Cherry (e)

CHILAS: Go: Darang, 1280 m (*Nüsser*); Gor, Ranote, 1800-2050 m (*Nüsser*).

1280-2050 m / ph.

Rarely cultivated.

Prunus jacquemontii Hook. f. (*Cerasus jacquemontii* (Hook. f.) Buser, *P. prostrata* sensu Hook. f., non Labill.) / tonel (sh)

ASTOR: Conway (Cat. Pak.). – Da: Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 236* (B!); Ramghat, 1500 m, *Troll 7050* (“*Prunus* shrub”). – As: Gudai, 2600 m, *Troll 7047* (“*Prunus* shrub”); Gurikot, R. R. *Stewart 18901* (Cat. Pak.). – Ru: Tarishing – Churit, 2730 m, *Nüsser 149* (B!).

1500-2730 m / coll.-submont.: forest, rock, steppe (*Cedrus*) / Afgh., W Himalaya: Chitral – NW India, SW Karakorum / W HIM / np.

● ***Prunus persica*** / Peach (e)

CHILAS: Go: Darang, 1280 m (*Nüsser*).

1280 m / ph.

Rarely cultivated.

Rosa brunonii Lindl. (*R. moschata* auct., non J. Herrmann)

ASTOR: Da: Mushkin, 1900 m, *Troll 7268* (cf., *R. moschata*). – Ka: Kalapani, 3050 m, *Schickhoff 1251* (!).

1900-3050 m / coll.-mont.: dwarf scrub (*Artemisia santolinifolia*) / Himalaya: Kashmir – Assam, Burma, W China / HIMAL / np.

Troll's record under *R. moschata* most probably refers to here.

[*Rosa canina* L. (*R. corymbifera* Borkh.) / Dog-rose (e)]

ASTOR: As: Astor – Rama, R. R. *Stewart 22872* (“*R. corymbifera*”, Cat. Pak.).

N Africa, Europe, W, SW & C. Asia / EURAS / np.

Cited from Chitral and Swat in Flora Iranica; this record is possible, but unconfirmed.

Rosa foetida J. Herrmann / ishkapur (sh)

ASTOR: Ka: Faqirkot, 2800 m, *Hansen 59* (!).

2800 m / mont. / SW Asia: Turkey, Caucasus – Afgh., Turkestan, Pakistan / IRAN / np.

Rosa macrophylla Lindl. (*R. alpina* L. var. *macrophylla* (Lindl.) Boulenger, *R. saundersiae* Rolfe) / sattapurri (sh)

ASTOR: Da: Mushkin RH <, 2580 m, *Dickoré 12715* (!). – Ru: Tarishing, 2930 m, *Nüsser 1602* (B!); 2930 m, *Nüsser 1601* (B!). – Ka: Faqirkot, 2800 m, *Hansen 57* (!).

2580-2930 m / submont.-mont.: forest, moist (*Pinus wallichiana*, *Salix wallichiana*) / Himalaya: Kashmir – Bhutan / HIMAL / np.

Rosa webbiana Wall. ex Royle / chingay, shingey, shingeyon mayaro, kini shingey (sh)

CHILAS: Babusar Valley, 3200 m (*Schickhoff 1719*). – Go: Gor, 2300 m, *Troll 7156*; 2650 m (*Dickoré*); 2690 m, *Schickhoff 1562* (!); 3230 m (*Schickhoff 1552*); 3520 m, *Schickhoff 1473* (!); Gor, Martal, 2920 m, *Nüsser 1157* (B!). – Pa: Diamir Valley, 2970 m, *Schickhoff 2415* (!); 3150 m, *Schickhoff 2462* (!). – Ra: Raikot Valley, Pungadori, 3300 m, *Nüsser 358* (B!). – Bu: Muthat – Raikot Bridge, 2320 m, *Nüsser 1051* (B!). — ASTOR: Da: Doian, 2000-3000 m, *Troll 7227*; 2080 m (*Dickoré*); Harchu Valley, Lathang, 2600 m, *Nüsser 821* (B!); Mushkin Forest, 2580 m, *Schickhoff 1142* (!). – Ru: Churit – Bulashbar, 2480 m, *Nüsser 803* (B!); Tarishing, 2910 m, *Nüsser 757* (B!); 2930 m, *Nüsser 1603* (B!); Tarishing – Churit, 2730 m, *Nüsser 148* (B!). – Ka: Faqirkot, 2800 m, *Hansen 58* (!); 2900 m, *Hansen 111* (!).

2000-3520 m / submont.-subalp.: forest, scrub, steppe-forest (*Cedrus*, *Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / Karakorum, W Himalaya: Afgh. – Nepal / W HIM / np.

Rubus irritans Focke (*R. parvifolius* Duthie, *R. purpureus* Hook. f., non Bunge) / uchjay, eiché (sh)

CHILAS: Ra: Raikot Valley, 3220 m, *Schickhoff 1684* (!); Raikot Valley, right slope, 3470 m, *Nüsser 995* (B!). – Bu: Lichar Valley, 3200 m, *Troll 7588* (cf., *Rubus*). — ASTOR: Da: Mushkin Forest, 2580 m, *Schickhoff 1125* (!); 2900 m, *Schickhoff 1381* (!); 3000 m, *Schickhoff 1437* (!); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 251* (B!); Mushkin RH <, 2580 m, *Dickoré 12714* (!); Mushkin RH > SE, 2720 m, *Dickoré 12774* (!). – As: Bulashbar Bridge, 2420 m, *Nüsser 813* (B!); Chillam, *R. R. Stewart* (Cat. Pak.); Rama, *R. R. Stewart* (Cat. Pak.); 3300 m, *Hansen 46* (!); Rama Valley, Sachen Gl., left ablation valley, 3480 m, *Nüsser 203* (B!). – Ru: Rupal Valley, *R. R. Stewart*. – Ka: Faqirkot, 2980 m, *Schickhoff 1302* (!).

2420-3480 m / submont.-subalp.: forest, meadow, moist, scrub (*Pinus wallichiana*, *Salix wallichiana*) / W Himalaya: E Afgh. (Kurram, Nuristan) – Kashmir, SW Karakorum / W HIM / np.

Rubus saxatilis L. / popé (sh), Stone Bramble (e)

ASTOR: Da: Mushkin RH <, 2580 m, *Dickoré 12731* (!); Turbaling, 2700 m, *Troll 7898*. –

As: Gudai – Chillam, *R. R. Stewart 18952* (Cat. Pak.). – Ka: Faqirkot, 2800 m, *Hansen 155* (!); Kalapani Valley, 3300 m, *Troll 8026*. — ASTOR/KASHMIR: Kamri P., 2740-4260 m (Cat. Pak.). — ASTOR/DEOSAI: Burzil P., 2740-4260 m (Cat. Pak.). 2580-4260 m / submont.-alp.: forest, moist (*Pinus wallichiana*, *Salix wallichiana*) / Europe, W Asia; W Himalaya: Rakaposhi, Nanga Parbat, Kashmir / EURAS / he. Apparently an isolated outpost of an Euro-Siberian distribution area.

Sibbaldia cuneata (Wall. ex Lehm.) Hornem. ex Kuntze (*Potentilla cuneata* Wall. ex Lehm., *P. sibbaldi* Hook. f., *S. parviflora* Kitam., *S. procumbens* L. s.l.) / methari kadj (sh)
 CHILAS: Babusar P. N, 3520-3570 m, *Dickoré 12837* (!); 3700 m, *Dickoré 12860* (!); Babusar P. NE, 4210 m, *Dickoré 12923* (!). – Go: Gor, Kahlimay, 3610 m, *Nüsser 1087* (B, det. Soják !); Gor, Kahlimay >, 3770 m, *Nüsser 1108* (B, det. Soják !); Gor, Martal, 2970 m, *Nüsser 1151* (B, det. Soják !). – Pa: Diamir Valley, 4200 m, *Peer* (!); Pattaro Valley, 3950 m, *Nüsser 1354* (B, det. Soják !); Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser 1383* (B, det. Soják !). – Ra: Bezar Gali E, Sagar, 3750 m, *Nüsser 535* (B, det. Soják !); Bezar Gali S, Fulu, 4180 m, *Nüsser 539* (B, det. Soják !); Fairy Meadows, 3350 m, *Nüsser 956* (B, det. Soják !); 3390 m, *Nüsser 951* (B, det. Soják !); Raikot Gl., nunatak, BC, 3970 m, *Nüsser 449* (B, det. Soják !); 4100 m, *Nüsser 477* (B, det. Soják !); Raikot Valley, Bayal, 3600 m, *Nüsser 1267* (B, det. Soják !); Raikot Valley, Jut, 3310 m, *Nüsser 942* (B, det. Soják !); Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 350* (B, det. Soják !). — ASTOR: Da: Doian, 3000-3500 m, *Troll 7230*; Doian Ridge, 3800 m, *Troll 7569*; Harchu Valley, 3500 m, *Nüsser 846* (B, det. Soják !). – As: Rama Ridge, 4000 m, *Nüsser 215* (B, det. Soják !); Rama Valley, 3180 m, *Nüsser 898* (B, det. Soják !); 3180 m, *Nüsser 896* (B, det. Soják !); 3700 m, *Nüsser 161a* (B!); Rama Valley, left slope, 3620 m, *Nüsser 209* (B, det. Soják !). – Ru: Rupal Valley, Nagachakali, nunatak, 3440 m, *Nüsser 600* (B, det. Soják !); 3620 m, *Nüsser 611* (B, det. Soják !); 3870 m, *Nüsser 629* (B, det. Soják !). — ASTOR/KASHMIR: Kamri P., 4000 m, *Troll 8072*. 2970-4490 m / mont.-alp.: alluvial fan, avalanche path, dwarf scrub, turf, scree, rock, meadow, moist, rocky slope, turf (*Bistorta affinis*, *Juniperus communis*) / Pamir, Karakorum, Himalaya: Afgh. – SE Tibet / TIBET / ch.

Sibbaldia tetrandra Bunge (*Dryadanthe tetrandra* (Bunge) Juz., *Potentilla tetrandra* (Bunge) Hook. f.)
 CHILAS: Babusar P., 4300 m, *Miehe 557* (!); Babusar P. NE, 4210 m, *Dickoré 12887* (!). 4210-4300 m / alp.: dwarf scrub, rock, scree, turf / Karakorum, Tibet, Himalaya / TIBET / ch.

Sorbaria tomentosa (Lindl.) Rehder (*Schizonotus tomentosus* Lindl., *Sorbaria lindleyana* Maxim., *Spiraea lindleyana* Wall.)
 CHILAS: Pa: Diamir Valley, 1700 m, *Schickhoff 2615* (!). 1700 m / coll.: moist ravine / Pamir, W Himalaya: Afgh. – Nepal / W HIM / np.

[*Sorbus cashmiriana* Hedlund (*Pyrus ursina* var. *typica* C. K. Schneider, *P. foliolosa* var. *cashmiriana* (Hedl.) Parker)]
 CHILAS: Ra: Raikot Valley, Bezar, 3600 m, *Troll 7647*. — ASTOR/DEOSAI: Burzil P., *Koelz 9399* (Cat. Pak.). 3600 m / subalp. / E Afgh., Kashmir – Uttar Pradesh / W HIM / ph. Records may refer to *S. tianschanica*.

Sorbus lanata (D. Don) S. Schauer (*Pyrus lanata* D. Don)ASTOR: Ka: Kalapani Valley, 3000 m, *Troll* 7990.

3000 m / mont. / W Himalaya: Afgh. – Nepal / W HIM / ph.

Sorbus tianschanica Rupr. (*Sorbus aucuparia* auct., non L.) / bezar (sh)

CHILAS: Go: Gor, 3230 m (*Schickhoff* 1545); 3520 m, *Schickhoff* 1468 (!); Gor, Kahlmay <, 3500 m, *Nüsser* 1121 (B!). – Pa: Diamir Valley, 3150 m, *Schickhoff* 2439 (!). – Ra: Bazar Gali – Fairy Meadows, 3600 m, *Nüsser* 550 (B!); Raikot Gl., right lateral moraine, 3430 m, *Nüsser* 303 (B!); Raikot Valley, 3230 m, *Schickhoff* 1618 (!); Raikot Valley, Bazar, 3630 m, *Nüsser* 531 (B!). — ASTOR: Da: Doian – Khoijut, 3400-3500 m, *Troll* 7231; Mushkin Forest, 3000 m (*Schickhoff* 1446). – As: Rama Valley, Sachen Gl. <, 3220 m (*Schickhoff* 975); 3380 m, *Schickhoff* 993 (!). – Ru: Latobo S, 3780 m, *Nüsser* 90 (B!); Rupal, 3300 m, *Troll* 7398; Rupal Valley, Shaigiri, 3800 m, *Nüsser* 1565 (B!).

3000-3800 m / mont.-subalp.: forest, scrub (*Abies*, *Betula*, *Picea*, *Pinus wallichiana*) / Tian Shan, Pamir, SW Karakorum, W Himalaya / PAMIR / ph.***Spiraea lasiocarpa*** Kar. & Kir. (*S. hypericifolia* Kar. & Kir., *S. crenata* Pamp., *S. lycioides* Parker, ? *S. affinis* Parker) / luni, mujon bish (sh)

CHILAS: Go: Gor, 3520 m, *Schickhoff* 1471 (!). – Bu: Buldar Valley, 2600-3700 m, *Troll* 7599 (“*Spiraea*”). — ASTOR: Da: Doian – Mushkin, 2500 m, *Troll* 7248 (“*Spiraea*”). – As: Chongra, 3000 m, *Hansen* 186 (!). – Ru: Latobo, Tap Gl., left lateral moraine, 3750 m, *Nüsser* 33 (B!); Rupal Valley, Nagachakali, nunatak, 3520 m, *Nüsser* 637 (B!); Rupal Valley, Shaigiri, 3800 m, *Nüsser* 1566 (B!); Tap – Latobo, 3500-3600 m, *Troll* 7410 (“*Spiraea*”); Tap Gl., terminal moraine, 3600 m, *Nüsser* 16 (B!). — ASTOR/DEOSAI: Burzil P., *Duthie* 14004 (“*S. affinis*”, Cat. Pak.).

2500-3800 m / mont.-subalp.: scrub / SW & C. Asia, Himalaya / IRAN / np.

Rubiaceae***Asperula oppositifolia*** Regel & Schmalh.

CHILAS: Babusar < 1 mile, *M. Qaiser* & *A. Ghafoor* 5400 (KUH, “subsp. *pseudocynanchica*”, Fl. Pak. 190); Babusar Village (“subsp. *albiflora*”, Cat. Pak.). – Bu: Muthat – Raikot Bridge, 2330 m, *Nüsser* 1049 (B!). — ASTOR: Da: Astor – Bunji, 1300-2300 m, *F. Schmid* 1799 (RAW, “subsp. *grandiflora*”, Fl. Pak. 190); Dashkin – Luskum, 2300 m, *Troll* 7279 (“*A. brachyantha*”); Mushkin Forest, RH – Dashkin, 2660 m, *Nüsser* 265 (B!); Ramghat, 1200-1800 m, *Troll* 7061 (“*A. brachyantha*”).

1200-2660 m / coll.-submont.: desert-steppe, steppe, steppe-forest / Pamir, Afgh., Pakistan / PAMIR / ch.

The division of this polymorphic species into various subspecies does not seem to be quite satisfactory.

Galium aparine L. / Cleavers (e)

CHILAS: Babusar Valley, 2750 m, *Schickhoff* 1748 (!); 3200 m, *Schickhoff* 1721 (!). – Go: Gor Gali, 2500-2800 m, *Troll* 7110; Gor, Martal <, 2810 m, *Nüsser* 1161 (B!). — ASTOR: Ka: Faqirkot, 2980 m, *Schickhoff* 1311 (!); Kalapani, 3260 m, *Schickhoff* 1206a (!).

2500-3260 m / submont.-mont.: forest, ruderal (*Abies*, *Cedrus*, *Pinus wallichiana*) / N Africa, Europe, Asia / EURAS / th.

Specimens cited may (in part?) belong to *G. spurium* L.

Galium asperuloides Edgew. (*G. triflorum* sensu Hook. f., non Michx.)

CHILAS: Go: Gor > NW, 2770 m, *Dickoré* 12600 (!). — ASTOR: Ka: Kalapani, 3260 m, *Schickhoff* 1219 (!); Kalapani Valley, 3300 m, *Troll* 8014 (“*G. triflorum*”).

2770-3300 m / mont.: forest, moist, steppe-forest (*Abies*, *Pinus gerardiana*) / Himalaya: Afgh. – SE Tibet, China / HIMAL / ge.

Galium boreale L. / katsh (sh) / Northern Bedstraw (e)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir* 2787 (RAW, Fl. Pak. 190). — ASTOR: (Cat. Pak.). – As: Gurikot, 2400 m, *Troll* 7364; Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff* 1015 (!); 3220 m, *Schickhoff* 972 (!). – Ru: Village Lower Rupal, 3100 m, *Nüsser* 1590 (B!); Zaipur >, 3140 m, *Schickhoff* 1108 (!). – Ka: Faqirkot, 2800 m, *Hansen* 34 (!); 2980 m, *Schickhoff* 1308 (!); 3220 m, *Schickhoff* 1355 (!); Kalapani, 3050 m, *Schickhoff* 1254 (!); 3260 m, *Schickhoff* 1208 (!). — ASTOR/DEOSAI: Deosai – Chillam, 3350 m, *E. Nasir & Webster* 6405 (RAW, Fl. Pak. 190).

2400-3960 m / submont.-alp.: dwarf scrub, forest (*Abies*, *Artemisia santolinifolia*, *Pinus wallichiana*) / Europe, Asia, N America / CIRC POL / he.

Galium elegans Wall. (*G. rotundifolium* sensu Hook. f., non L.)

ASTOR: *Giles* 681 (Cat. Pak.).

Himalaya: Afgh. – SE Tibet, SW China / HIMAL / ch.

Galium pauciflorum Bunge (*G. aparine* var. *pauciflorum* (Bunge) Maxim.)

ASTOR: 3960 m, *E. Nasir & Webster* 6153 (RAW, Fl. Pak. 190). — ASTOR/DEOSAI: Burzil Chowki, 3040-3350 m, *R. R. Stewart* 19817 (RAW, Fl. Pak. 190).

3040-3960 m / mont.-alp. / C. Asia, W Himalaya / C AS / th.

May be included in *G. aparine*.

Galium tenuissimum M. Bieb. (*G. trichophorum* Kar. & Kir.)

CHILAS: Ra: Darang – Jalipur, 1200 m, *Troll* 7167.

1200 m / coll. / SE Europe, SW Asia, NW Himalaya: Chitral – Kashmir / EURAS / he.

Galium verum L. / Lady’s Bedstraw (e)

CHILAS: Babusar, *S. Abedin & M. Qaiser* 9040 (KUH, Fl. Pak. 190); Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir* 2792 (RAW, Fl. Pak. 190); Babusar Valley, 3200 m, *Schickhoff* 1703 (!). – Pa: Diamir Valley, 3150 m, *Schickhoff* 2459 (!). — ASTOR: Da: Doian, 1950-07-25, *A. H. Khan* (RAW, Fl. Pak. 190). – As: Dumusar Valley, 3200 m, *Troll* 7529. – Ka: Kalapani, *Giles* 675 (Cat. Pak.); 3050 m (*Schickhoff* 1283).

3050-3960 m / mont.-alp.: dwarf scrub, forest (*Artemisia santolinifolia*, *Pinus wallichiana*) / N Africa, Europe, Asia / EURAS / he.

Rubia cordifolia L. (*R. akane* Nakai, *R. cordifolia* f. *akane* (Nakai) Kitam., *R. cordifolia* var. *munjista* (Roxb.) Miq., *R. purpurea* DC.)

ASTOR: Upper Astor, *R. R. & I. D. Stewart 18745* (RAW, Fl. Pak. 190). – Da: Harchu Valley, Lathang, 2600 m, *Nüsser 818* (B!). – As: Gurikot, 2400 m, *Troll 7548*; 2500 m, *Troll 7343*. 2400-2600 m / submont. / N Africa, SE Europe, S & E Asia / EURAS / he.

Rutaceae

Haplophyllum gilesii (Hemsley) C. C. Townsend (*Ruta gilesii* Hemsley)

CHILAS: Go: Darang >, 1550 m, *Dickoré 12675* (!); Gor, 1400-2180 m (*Dickoré*); 1850 m, *Schickhoff 1460* (!); Thelichi, 1260 m, *Dickoré 12508* (!). – Bu: Indus Valley, Astor Valley – Raikot Bridge, 1470 m, *Nüsser 909* (B!); Muthat – Raikot Bridge, 1950 m, *Nüsser 1061* (B!). — ASTOR: Da: Bunji (Cat. Pak.); lower Astor, *Duthie 12290* (Cat. Pak.); Ramghat, 1200-1800 m, *Troll 7078*.

1200-2180 m / coll.-submont.: alluvial terrace, semi-desert, forest, rock, steppe (*Artemisia fragrans*, *Heliotropium dasycarpum*, *Stipagrostis plumosa*) / Gilgit, Chilas, Astor / ENDEM / ch.

Salicaceae

Populus caspica Bornm. (*P. alba* L. s.l.) / fratz (sh)

ASTOR: (Cat. Pak.). – Da: Doian, 1780 m (*Dickoré*); Doian – Mushkin, 2000-2700 m, *Troll 7238*; Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 250* (B!). – As: Astor, 2310 m (Kazmi & Siddiqui 1953).

1780-2700 m / coll.-submont. / Caucasus – C. Asia, Himalaya / IRAN / ph.
Possibly indigenous, planted for timber.

Populus ciliata Wall. ex Royle (*P. pyriformis* Royle, *P. rotundifolia* Griff.)

CHILAS: Bu: Buldar Valley, 2600 m, *Troll 7592*. — ASTOR: (Cat. Pak.).

2600 m / submont. / Himalaya: Swat – SE Tibet / HIMAL / ph.

Populus nigra L. (*P. italica* (Duroi) Moench, *P. nigra* var. *pyramidalis* (Borkh.) Spach, *P. pyramidalis* Roz.) / fratz (sh), changma (u), Black-poplar (e)

ASTOR: Da: Doian, 1780 m (*Dickoré*). – As: Astor (Kazmi & Siddiqui 1953). – Ru: Tarishing – Churit, 2730 m, *Nüsser 152* (B!).

1780-2730 m / mont. / Europe, Asia / EURAS / ph.
Planted for timber; medicinal.

[*Salix acmophylloides* Hausskn. & Bornm. (*S. schlagintweitii* N. J. Andersson)]

ASTOR: 1856-09, *Schlagintweit* (Cat. Pak.).

Record needs confirmation.

Salix caesia Vill. (*S. divergens* N. J. Andersson, *S. minutiflora* Turcz. ex E. Wolf., *S. myricifolia* N. J. Andersson, *S. sclerophylla* var. *pubescens* N. J. Andersson ?)

CHILAS: Ra: Fairy Meadows, 3390 m, *Nüsser 948* (B!, cf.); Raikot Valley, Bayal, 3500 m, *Troll 7635* (“*S. divergens*”). — ASTOR: As: Chillam, *R. R. Stewart* (Cat. Pak.). – Ru: Upper Rupal Valley, 3500-3600 m, *Troll 7465* (“*S. divergens*”).

3390-3600 m / mont.-subalp.: fen / Europe, W & N Asia, S to E Pamir, W Himalaya / EURAS / ch.

Rare and disjunct in Inner W Himalaya (Astor, Deosai, Dras, Zanskar).

[*Salix capusii* Franch. (*S. coerulea* E. Wolf, *S. egbertii-wolfii* Toepffer)]

ASTOR: As: Gurikot – Das Kirim, *R. R. Stewart 22964* (Cat. Pak.).

Pamir, Afgh., Chitral, ?Astor / PAMIR.

Record needs confirmation.

Salix denticulata N. J. Andersson (? *S. himalayensis* Klotzsch ex N. J. Andersson, *S. elegans* Wall. ex N. J. Andersson, non Besser)

ASTOR: (Cat. Pak.).

W Himalaya: Afgh. – Nepal / W HIM / np.

A species of the Himalaya S slope, may well occur near the southern passes of Astor.

[*Salix denticulata* × *karelinii* (? *S. elegans* Wall. var. *govianiana* N. J. Andersson)]

CHILAS: Babusar Village, *M. A. Siddiqi 2741* (Cat. Pak.). — ASTOR: As: Waylari, *Winterbottom 539* (Cat. Pak.). — Ka: Kalapani, *Giles 171* (Cat. Pak.). — ASTOR/DEOSAI: Burzil P., *C. B. Clarke 20691a* (Cat. Pak.).

Records may refer to *S. karelinii*; hybrids with *S. denticulata* do not seem to be particularly common, both species are largely vicarious.

Salix flabellaris N. J. Andersson (? *S. lindleyana* auct., non Wall. ex N. J. Andersson)

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12883* (!). — Ra: Raikot Gl., nunatak, 4270 m, *Nüsser 390* (B!); Raikot Gl., nunatak, BC, 4000 m, *Troll 7756*. — Bu: Buldar Gl., 4200 m, *Troll 7845*. — ASTOR: As: Rama Valley, 3800 m, *Nüsser 167* (B!). — Ru: Rupal Valley, Nagachakali, nunatak, 3870 m, *Nüsser 627* (B!). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19122* (cf., *S. lindleyana*, Cat. Pak.).

3800-4270 m / subalp.-alp.: alluvial fan, boulder slope, dwarf scrub, turf, scree, rock, turf / SW Karakorum, W Himalaya: E Afgh. – Tehri Garhwal / W HIM / ch.

Salix iliensis Regel (*S. pseudocaprea* M. Popov, *S. pseudovivida* Goerz, *S. pseudowallichiana* Goerz.) / bijau (sh)

CHILAS: Ra: Bezar Gali – Fairy Meadows, 3600 m, *Nüsser 548* (B!); Raikot Gl., nunatak, 3890 m, *Nüsser 426* (B!); Raikot Gl., right lateral moraine, 3520 m, *Nüsser 307* (B!). — ASTOR: As: Rama moraine, *E. Nasir & Webster 5996* (Cat. Pak.). — Ru: Rupal Valley, Lolio Duru, 3800 m, *Nüsser 1562* (B!); 3800 m, *Nüsser 1564* (B!); Rupal Valley, Shaigiri, 3650 m, *Nüsser 23* (B!). — Ka: Faqirkot, 3220 m, *Schickhoff 1341* (!).

3220-3890 m / mont.-subalp.: forest, meadow, scrub (*Abies*, *Pinus wallichiana*, *Salix*) / Tian Shan, Pamir, SW Karakorum, W Himalaya / PAMIR / np.

A larger shrub or small tree up to 3.5 m, leaves used as winter fodder.

Salix karelinii Turcz. ex Stschegl. (? *S. himalayensis* (N. J. Andersson) Flöd., *S. hastata* auct., non L., *S. prunifolia* Kar. & Kir., non Sm.) / suhsuhrbay (sh)

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12882* (!). — Pa: Bunar Valley, 4200 m, *Peer* (!). —

Ra: Kosto Valley, 3800 m, *Nüsser 1451* (B!); 3800 m, *Nüsser 1450* (B!); 4300 m, *Nüsser 1416* (B!); Raikot Gl., nunatak, 4000 m, *Nüsser 410* (B!); 4000 m, *Nüsser 409* (B!); 4120 m, *Nüsser 370* (B!); Raikot Gl., nunatak, BC, 3910 m, *Nüsser 1286* (B!); 4000 m, *Troll 7751a*; Raikot Valley, 3500-4300 m, *Troll 7634*; 3560 m, *Schickhoff 1633* (!); Raikot Valley, Bayal, 3500 m, *Troll 7636*; Raikot Valley, right slope, 3830 m, *Nüsser 987* (B!). — ASTOR: Da: Rama Ridge N, 3500-3900 m, *Troll 7302*. — As: Bulan Ridge, 4100 m, *Nüsser 183* (B!); Rama Forest, 3350 m, *Schickhoff 1004* (!); Rama Valley, Sachen Gl. <, 3380 m, *Schickhoff 996* (!). — Ru: Bazhin Gl. S, 3700 m, *Nüsser 94* (B!); Latobo, 3540 m, *Nüsser 728* (B!, cf.); Latobo S, 4200 m, *Nüsser 86* (B!); Tap Gl. right lateral moraine, 3580 m, *Nüsser 739* (B!); upper Rupal Valley, 3600-4000 m, *Troll 7463*.

3350-4300 m / mont.-alp.: alluvial plain, avalanche path, dwarf scrub, turf, scree, rock, forest, scree / boulders (*Abies*, *Betula*, *Rhododendron anthopogon*) / Tian Shan, Pamir, SW Karakorum, W Himalaya: Afgh. – Nepal / PAMIR / np.

Salix linearifolia E. Wolf (*S. blakii* Goerz, *S. olgae* Regel) / bijau (sh)

ASTOR: Ru: Churit – Bulashbar, 2480 m, *Nüsser 799* (B!).

2480 m / submont. / Tian Shan, Pamir, SW Karakorum, W Himalaya / PAMIR / np.

[*Salix myrtillacea* N. J. Andersson]

ASTOR: Da: Doian >, *Duthie 12475* (Cat. Pak.).

An E Himalayan species, probably a misidentification.

Salix sericocarpa N. J. Andersson (*S. daphnoides* var. *indica* N. J. Andersson, *S. dolichostachya* Flöd., *S. insignis* N. J. Andersson, *S. oxycarpa* N. J. Andersson, *S. alba* auct., non L.) / bijau (sh), vair (sh)

CHILAS: Go: Gor – Darang, 2000 m (*Dickoré*). — Ra: Raikot Gl. tongue, 3240 m, *Nüsser 1005* (B!); Raikot Gl., right lateral moraine, 3520 m, *Nüsser 308* (B!); Raikot Valley, 3360 m, *Schickhoff 1689* (!). — ASTOR: Da: Doian, 2400-2800 m, *Troll 7207* (“*S. oxycarpa*”). — As: Harchu – Astor, 2090 m (*Dickoré*). — Ru: Bazhin Lake, 3530 m, *Nüsser 8* (B!); Rupal Valley, 2300-4000 m, *Troll 7464* (“*S. oxycarpa*”); 3150 m, *Nüsser 120* (B!); Rupal Valley, Lolio Duru, 3800 m, *Nüsser 1563* (B!); Rupal Valley, Shaigiri – Latobo, 3600 m, *Nüsser 1571* (B!); Tap Gl., terminal moraine, 3580 m, *Nüsser 19* (B!); Tarishing, 2910 m, *Nüsser 758* (B!); Tarishing – Churit, 2730 m, *Nüsser 151* (B!, cf.); village Lower Rupal, 3030 m, *Nüsser 746* (B!). — Ka: Faqirkot, 2800 m, *Schickhoff 1375* (!); Kalapani, 3010 m, *Schickhoff 1289* (!); Shankargarh, *Giles 13* (Cat. Pak.).

2000-4000 m / submont.-alp.: fen, field, groves, meadow, riverside (*Salix sericocarpa*) / C. Asia, W Himalaya, S Tibet / C AS / ph.

Commonly cultivated for timber and winter fodder, also possibly wild, medicinal.

[*Salix tetrasperma* Roxb.]

ASTOR: As: Astor (Kazmi & Siddiqui 1953). — Ka: Rattu (Kazmi & Siddiqui 1953).

Identity unknown; medicinal.

[*Salix viminalis* L. (*S. gmelinii* Pallas, *S. serotina* Pallas)]

ASTOR: *Duthie 14056* (Cat. Pak.). — Ka: Rattu, *R. R. Stewart* (Cat. Pak.).

Doubtful record, may refer to *S. turanica* Nasarov.

Salix wallichiana N. J. Andersson (*S. julacea* N. J. Andersson) / bijau (sh)

CHILAS: Pa: Diamir Valley, 2970 m, *Schickhoff 2413* (!). – Ra: Raikot Valley, 2300 m, *Schickhoff 1598* (!). — ASTOR: Da: Doian, 2400-2800 m, *Troll 7206*; Doian – Khoijut, 3500 m, *Troll 7232*; Doian – Turbaling, 2360-2600 m (*Dickoré*); Harchu Valley, Karmi Haray, 2740 m, *Nüsser 825* (B!); 2850 m, *Nüsser 834* (B!); Mushkin Forest, *Duthie 12274* (“*S. julacea*”, Cat. Pak.); 2580 m, *Schickhoff 1114* (!); 2900 m, *Schickhoff 1411* (!); 3000 m, *Schickhoff 1444* (!); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 239* (B!, cf.); Mushkin RH <, 2580 m, *Dickoré 12712* (!). – Ru: Chichi Valley, 3050 m, *Nüsser 136* (B!); Rupal, 3300-3600 m, *Troll 7466*.

2300-3600 m / submont.-subalp.: forest, hay meadow, riverside (*Pinus wallichiana*, *Salix wallichiana*) / Mongolia, China, SW Karakorum, Himalaya / C AS / np.

Salix wilhelmsiana M. Bieb. (*S. angustifolia* auct., non Willd., *S. trautvetteriana* Regel)

CHILAS: Go: Darang >, 1450 m, *Dickoré 12688* (!).

1450 m / coll.: scrub / C. Asia, Karakorum, W Himalaya / C AS / np.

Santalaceae***Thesium hookeri*** Hedrych (*T. himalense* Hook. f., non Royle, *T. multicaule* Hook. f. & Thomson, non Ledeb.)

ASTOR: Da: Doian Ridge, 3500 m, *Troll 7582* (“*Thesium*”); Mushkin Forest, 3000 m, *Schickhoff 1443* (!). – As: Rama Valley, *Lankester & Pearson 1306* (BM, “var. *jarmilae*”, Fl. Pak. 159). – Ru: Tarishing, 2900 m, *Troll 7397* (“*Thesium*”).

2900-3500 m / mont.-subalp.: forest (*Pinus wallichiana*) / Himalaya: E Afgh. – S Tibet / HIMAL / ge.

Saxifragaceae***Bergenia stracheyi*** (Hook. f. & Thomson) Engl. (*Saxifraga stracheyi* Hook. f. & Thomson) / tchapur, shapur (sh)

CHILAS: Babusar P., 3960 m, *M. A. Siddiqi & Y. Nasir 2815* (RAW, Fl. Pak. 108). – Pa: Diamir Valley, 3150 m, *Schickhoff 2444* (!). – Ra: Raikot Gl., nunatak, 3880 m, *Nüsser 442* (B!); Raikot Valley, 3560 m, *Schickhoff 1635* (!). — ASTOR: Conway (Cat. Pak.). – Da: Doian – Khoijut, 3300-3700 m, *Troll 7233*; Mushkin RH > SE, 2770 m, *Dickoré 12791* (!). – As: Rama, 3000 m, *Hansen 51* (!); Rama Valley, Sachen Gl. <, 3380 m, *Schickhoff 988* (!). – Ru: Latobo S, 4120 m, *Nüsser 64* (B!); Rupal Valley, Nagachakali, nunatak, 3890 m, *Nüsser 659* (B!). — ASTOR/DEOSAI: Burzil P. top, Kuthnar, 3040 m, *R. R. Stewart & E. Nasir 23888* (RAW, Fl. Pak. 108).

2770-4120 m / mont.-alp.: forest, moraine, scrub (*Abies*, *Betula*, *Pinus wallichiana*) / Pamir, Afgh., W Himalaya / PAMIR / ch.

Medicinal, source of tannine.

Saxifraga androsacea L.

CHILAS: Ra: Kosto Valley, 4400 m, *Troll 7737*; Raikot Valley, Nunatak, 3750 m, *Troll 7763*. — ASTOR/KASHMIR: Kamri P., 3960 m, *R. R. Stewart* (“var. *tridentata*”, Fl. Pak. 108);

Kamri P. top, *R. R. Stewart* 22716 (“var. *tridentata*”, Cat. Pak.).

3750-4400 m / subalp.-alp. / Europe, Asia / EURAS / ch.

Apparently rare in SW Karakorum and NW Himalaya.

Saxifraga asarifolia Sternb. (*S. odontophylla* Wall. ex Hook. f. & Thomson)

ASTOR/KASHMIR: Kamri P., 3040-3960 m, *R. R. Stewart* & *E. Nasir* 22649 (RAW, Fl. Pak. 108); 3040 m, *R. R. & I. D. Stewart* 18686 (RAW, Fl. Pak. 108).

3040-3960 m / mont.-alp.: forest, shady places / W Himalaya: Kashmir – Bhutan / W HIM / he. Also rare in Gilgit (Naltar).

Saxifraga flagellaris Willd. ex Sternb.

subsp. ***crassiflagellata*** Hultén

CHILAS: Babusar P. N., 3700 m, *Dickoré* 12851 (!); Babusar P. NE, 4210 m, *Dickoré* 12895 (!).

– Pa: Pattaro Valley, Guttum Sagar, 4320 m, *Nüsser* 1364 (B!); 4490 m, *Nüsser* 1380 (B!). –

Ra: Raikot Gl., nunatak, BC, 3970 m, *Nüsser* 451 (B!); 3990 m, *Nüsser* 1300 (B!). —

ASTOR: Ru: Rupal Valley, lower Mazeno BC moraine, 4050 m, *Nüsser* 1531 (B!); upper Mazeno BC, 4320 m, *Nüsser* 1463 (B!). — ASTOR/KASHMIR: Kamri P., 3960-4260 m, *R. R. Stewart* 18669 (K, Fl. Pak. 108). — ASTOR/DEOSAI: Burzil P., 3960-4260 m, *R. R. Stewart* 22075 (K, Fl. Pak. 108).

3700-4490 m / subalp.-alp.: avalanche path, dwarf scrub, meadow, rock, scree, turf / SW Karakorum, W Himalaya: Kashmir – Kumaon / W HIM / he.

subsp. ***mucronulata*** (Royle) Engl. & Irm.

ASTOR/KASHMIR: Kamri P., 3960-4260 m, *R. R. & I. D. Stewart* 18669 (RAW, Fl. Pak. 108).

3960-4260 m / alp. / W Himalaya: Kashmir – Kumaon / W HIM / he.

subsp. ***stenophylla*** (Royle) Hultén

CHILAS: Babusar P., 4000-4200 m, *Miehe* 573 (!). – Pa: Pattaro Valley, Guttum Sagar –

Kosto Gali, 4790 m, *Nüsser* 1401 (B!). – Ra: Raikot Gl. – Ganalo Gl. confluence, 3900 m,

Nüsser 285 (B!); Raikot Gl., nunatak, 4250 m, *Nüsser* 387 (B!). — ASTOR: Ru: Latobo S,

4270 m, *Nüsser* 83 (B!); Lolio Duru, 3900 m, *Troll* 7423 (“*S. flagellaris*”); Mazeno High

Camp, ascent, 4600 m, *Nüsser* 1495 (B!); 4650 m, *Nüsser* 1506 (B!); Toshain Valley, ascent

to Mazeno Gali, 5010 m, *Nüsser* 1520 (B!). — ASTOR/DEOSAI: Burzil P., 3960 m, *R. R. & I.*

D. Stewart 19012a (RAW, Fl. Pak. 108).

3900-5010 m / alp.-subniv.: boulder slope, scree / SW Karakorum, W Himalaya / W HIM / he.

Saxifraga hirculoides Decne. (*S. hirculus* var. *hirculoides* (Decne.) C. B. Clarke)

CHILAS: Babusar P., 4000-4200 m, *Miehe* 570 (!).

4000-4200 m / alp.: turf / S Karakorum, W Himalaya, W Tibet / W HIM / he.

Saxifraga jacquemontiana Decne.

CHILAS: Babusar P., 4300 m, *Miehe* 531 (!); Babusar P. NE, 4210 m, *Dickoré* 12886 (!). –

Pa: Pattaro Valley, 4600 m, *Troll* 7743. – Bu: Lichar Ridge, Lichar Peak <, 4000-4900 m,

Troll 7874.

4000-4900 m / alp.-subniv.: dwarf scrub, rock, scree, turf / SW Karakorum, W Himalaya:

Hazara – Bhutan / W HIM / ch.

Saxifraga moorcroftiana (Ser.) Wall. ex Sternb. (*S. diversifolia* var. *moorcroftiana* Ser.)
 ASTOR: As: Chillam, 3040 m, *R. R. & I. D. Stewart 18979* (RAW, Fl. Pak. 108); Gudai – Chillam, 2740 m, *E. Nasir & Webster 6509* (RAW, Fl. Pak. 108). – Ka: Rattu, 2700 m, *Troll 7951*.
 2700-3040 m / mont.: wet soil / Himalaya: Swat – Nepal, S Tibet, W China / HIMAL / he.

Saxifraga oppositifolia subsp. *asiatica* (Hayek) Engl. & Irm. (*S. asiatica* Hayek) / Purple Saxifrage (e)
 CHILAS: Ra: Raikot Valley, Nunatak, 4400 m, *Troll 7765*.
 4400 m / alp. / Siberia, Tian Shan, Pamir, Karakorum, NW Himalaya / C AS / ch.
 Rare in Karakorum and NW Himalaya.

Saxifraga pulvinaria H. Smith (*S. imbricata* Royle, non Lam.)
 CHILAS: Babusar P., 4300 m, *Miehe 505* (!). – Ra: Raikot Valley, 4400 m, *Troll 7744*;
 Raikot Valley, Nunatak, 4400 m, *Troll 7766*.
 4300-4400 m / alp.: rock, scree, turf / Karakorum, W Himalaya: Chitral – Sikkim / W HIM / ch.

Saxifraga sibirica L.
 CHILAS: Babusar P., 4300 m, *Miehe 532* (!); Babusar Village >, 2850 m, *Dickoré 12831* (!).
 – Go: Gor, 2800 m, *Troll 7144*; 2800 m, *Troll 7145*; 3230 m, *Schickhoff 1531* (!). – Pa: Diamir Valley, 3150 m, *Schickhoff 2448* (!). — ASTOR: (Cat. Pak.). – Da: Harchu Valley, Baro Nirril >, 3230 m, *Nüsser 873* (B!); Harchu Valley, Karmi Haray, 2740 m, *Nüsser 832* (B!). – As: Gudai, 2600 m, *Troll 7042*; Rama Valley, 3550 m, *Nüsser 159* (B!). – Ru: Chichi Valley, 3100 m, *Troll 7477*; Rupal Valley, Bayals – Chungphare, 3200 m, *Nüsser 793* (B!); Tarishing – Bayals, 3000 m, *Nüsser 791* (B!); upper Rupal Valley, 3800-4000 m, *Troll 7435*. – Ka: Kalapani, 3260 m, *Schickhoff 1239* (!); Kalapani – Kamri P., 3700 m, *Troll 8065* (“var. *purpureo-striata*”). — ASTOR/KASHMIR: Kamri P., *R. R. Stewart 22711* (K, RAW, Fl. Pak. 108); 3350-3960 m, *Giles 703* (K, Fl. Pak. 108). — ASTOR/DEOSAI: Burzil P., 3960 m, *R. R. & I. D. Stewart 19085* (RAW, Fl. Pak. 108).
 2600-4300 m / submont.-alp.: alluvial fan, forest, hay meadow, irrigated meadow, steppe-forest, turf (*Abies*, *Juniperus excelsa*, *Picea*, *Pinus wallichiana*) / E Europe, C. Asia, Karakorum, Tibet, Himalaya / EURAS / ge.

Scrophulariaceae

Chaenorhinum johnstonii (Stapf) Pennell (*Linaria johnstonii* Stapf, *Chaenorhinum minus* auct., non (L.) Lange)
 ASTOR: Da: Astor – Bunji, *F. Schmid* (Cat. Pak.).
 Afgh., W Himalaya / IRAN / th.
 Also reported from Baltistan (Sutton 1988).

Euphrasia aristulata Pennell
 ASTOR: As: Chillam, *R. R. Stewart 22028* (? also under *E. flabellata*, Cat. Pak.); Das Kirim, *R. R. Stewart 22970* (Cat. Pak.).
 W Himalaya: Astor, Hazara, Kashmir, Dras / W HIM / th.

***Euphrasia densiflora* Pennell**

ASTOR: Ru: Rattu – Rupal Valley, *R. R. & I. D. Stewart 18852* (GH, NY, type of *E. densiflora*, Pennell 1943). – Ka: Rattu >, *R. R. Stewart 22783* (Cat. Pak.).
Astor / ENDEM / th.

[*Euphrasia flabellata* Pennell]

ASTOR: As: Chillam, *R. R. Stewart 22028* (? also under *E. aristulata*, Cat. Pak.).
Baltistan / ENDEM / th.

***Euphrasia incisa* Pennell**

ASTOR: As: Gudai, *R. R. Stewart 19143* (GH, NY, RAW); 2550-2600 m, *R. R. & I. D. Stewart 18934* (GH, NY, RAW, type of *E. incisa*, Pennell 1943); Rama – Gurikot, *R. R. Stewart 22951a* (Cat. Pak.). – Ru: Tarishing, *R. R. Stewart 22847* (? also under *E. remota*, Cat. Pak.). 2550-2600 m / submont.: irrigation ditch, moist / Astor / ENDEM / th.

***Euphrasia paucifolia* Wettst.**

ASTOR: As: Burzil P. N, *R. R. Stewart 22986* (K, NA, NY, PH, Siddiqui & al. 1989); Burzil P. NW, *R. R. Stewart 19930* (NY, RAW, Pennell 1943, Siddiqui & al. 1989); *R. R. Stewart 19059* (NY, PH, RAW, Pennell 1943, Siddiqui & al. 1989). — ASTOR/KASHMIR: Kamri P., *R. R. Stewart 22696* (NY, PH, US, Siddiqui & al. 1989); *R. R. Stewart 22741* (NA, NY, PH, Siddiqui & al. 1989).
W Himalaya: Astor, Deosai, Kashmir – Spiti / W HIM / th.

***Euphrasia remota* Pennell**

ASTOR: (Cat. Pak.). – Ru: Tarishing, *R. R. Stewart 22847* (? also under *E. incisa*, Cat. Pak.). – Ka: Rattu >, 2700 m, *R. R. & I. D. Stewart 18792* (NY, RAW, type of *E. remota* Pennell, Cat. Pak.).
2700 m / mont. / Astor, Kashmir / ENDEM / th.

***Euphrasia schlagintweitii* Wettst.**

ASTOR: Da: Hajipir [Hattu Pir] (Cat. Pak.).
SW Karakorum, W Himalaya: Hazara – Garhwal / W HIM / th.

***Kickxia cabulica* (Benth.) D. A. Sutton (*Linaria incana* auct., non Wall.)**

ASTOR: Da: Ramghat, 1680 m, 1892-07-28, *Duthie 12283* (BM, Sutton 1988); 1200-1800 m, *Troll 7084* ("*Linaria incana*").
1200-1800 m / coll. / Afgh., Baluch., W Himalaya (Chitral, Gilgit, Astor) / IRAN / th.

***Lagotis cashmeriana* (Royle) Rupr. (*Gymnandra cashmeriana* Royle, *L. glauca* var. *cashmeriana* (Royle) Hook. f.)**

ASTOR/KASHMIR: Kamri (Cat. Pak.). — ASTOR/DEOSAI: Burzil P. (Cat. Pak.).
W Himalaya: Swat – Lahul / W HIM / ge.

***Lagotis kunawurensis* (Royle) Rupr. (*Gymnandra kunawurensis* Royle ex Benth., *L. glauca* var. *kunawurensis* (Royle) Hook. f.)**

ASTOR/DEOSAI: Burzil P., *R. R. Stewart* (Cat. Pak.).
SW Karakorum, Himalaya, S Tibet / W HIM / ge.

Leptorhabdos parviflora (Benth.) Benth. (*Gerardia parviflora* Benth., *L. benthamiana* sensu Hook. f., non Walpers)

CHILAS: Go: Gor, 2690 m, *Schickhoff 1567* (!); Gor > NW, 2840 m, *Dickoré 12605* (!); 2840 m, *Dickoré 12614* (!). – Ra: Tato – Muthat, 3200 m, *Troll 7833*. — ASTOR: Da: Dashkin, 2380 m (*Dickoré*); Mushkin Forest, 2580 m, *Schickhoff 1130* (!); 2900 m, *Schickhoff 1406* (!); 3000 m, *Schickhoff 1445* (!); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 238* (B!); Mushkin RH <, 2580 m, *Dickoré 12713* (!). – As: Rama (Cat. Pak.). – Ka: Rattu, *R. R. Stewart* (Cat. Pak.); *R. R. Stewart 18836* (Cat. Pak., Pennell 1943).

2380-3200 m / submont.-mont.: forest, steppe-forest (*Cedrus*, *Pinus gerardiana*, *Pinus wallichiana*, *Salix wallichiana*) / SW & C. Asia, S Karakorum, Himalaya: Afgh. – Nepal / IRAN / th.

Limosella aquatica L. / Mudwort (e)

ASTOR: As: Das Kirim – Sardar Kothi, *R. R. Stewart 22037* (Cat. Pak.). – Ru: Tarishing (Cat. Pak.).

Africa, Europe, Asia, N America / CIRCPOL / th.

Pedicularis bicornuta Klotzsch

CHILAS: Ra: Raikot Gl., nunatak, BC, 3900 m, *Nüsser 1302* (B!). — ASTOR: As: Bulan Ridge, 4100 m, *Nüsser 176* (B!). – Ru: Latobo S, 4150 m, *Nüsser 87* (B!); Rupal Valley, 3700 m, *Peer 7* (!); Tap, 3500 m, *Troll 7437*. — ASTOR/KASHMIR: Kamri, 3350-3960 m, *Giles* (Prain 1891).

3350-4150 m / mont.-alp.: dwarf scrub (*Rhododendron anthopogon*, *Salix karelinii*) / W Himalaya: E Afgh. – NW India, SW Karakorum / W HIM / he.

Pedicularis brevifolia D. Don (*P. chitralensis* Pennell)

CHILAS: Bu: Buldar Valley, Mamocho Peak <, 4200 m, *Troll 7855*. — ASTOR: Ru: Mazeno High Camp, ascent, 4550 m, *Nüsser 1489* (B!).

4200-4550 m / alp.-subniv. / W Himalaya: Kashmir – Nepal / W HIM / he.

Pedicularis cheilanthifolia Schrenk (*P. albida* Pennell, *P. cheilanthifolia* var. *albida* (Pennell) Tsoong)

CHILAS: Babusar P., 4050 m, *Miehe 448* (! “subsp. *svenhedinii*”, det. Yamazaki); 4300 m, *Miehe 474* (! “subsp. *svenhedinii*”, det. Yamazaki). — ASTOR/DEOSAI: Burzil P., *Koelz 9382* (Cat. Pak.). — Astor/Skardu: Alampi P., *Duthie* (DD, Pennell 1943).

4050-4300 m / alp.: scree, turf / Tian Shan, Pamir, Karakorum, W Himalaya / PAMIR / he.

Pedicularis pectinata Wall. ex Benth. / mishram (u)

CHILAS: Pa: Diamir Valley, 3150 m, *Schickhoff 2456* (!). – Ra: Ganalo Gl., nunatak, BC, 4200 m, *Nüsser 513* (B!); Raikot Gl., nunatak, 4400 m, *Nüsser 403* (B!); Raikot Gl., nunatak, BC, 3910 m, *Nüsser 1290* (B!); 4300 m, *Nüsser 489* (B!); 4400 m, *Nüsser 501* (B!); 4430 m, *Nüsser 507* (B!); Raikot Valley, 3220 m, *Schickhoff 1672* (!); Raikot Valley, Bayal, 3500 m, *Troll 7630*. — ASTOR: (Cat. Pak.). – As: Gurikot Valley, 3400 m, *Troll 7522*; Rama

Valley, Sachen Gl. <, 3380 m, *Schickhoff 991* (!). – Ru: Latobo, Tap Gl., 3900 m, *Nüsser 50* (B!); Zaipur >, 3120 m, *Schickhoff 1052* (!). — ASTOR/KASHMIR: Kamri P. (“subsp. *bipinnatifida*”, Cat. Pak.). — ASTOR/DEOSAI: Beyond Burzil P., *Winterbottom 589* (“subsp. *bipinnatifida*”, Cat. Pak.).

3120-4430 m / mont.-alp.: forest (*Abies*, *Betula*, *Picea*, *Pinus wallichiana*) / S Karakorum, W Himalaya: Afgh. – W Nepal / W HIM / he.

Medicinal.

Pedicularis punctata Decne. (*P. siphonantha* auct., non (D. Don) Hook. f., *P. siphonantha* var. *brevituba* Prain) / punar kadj, katsh (sh)

ASTOR: As: Astor Bazar, 2400 m, *Troll 7918* (“*P. siphonantha*”); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1038* (!). – Ru: Rupal Valley, 3140 m, *Nüsser 123* (B!); 3300 m, *Nüsser 109* (B!); Tarishing, 2910 m, *Nüsser 574* (B!, cf.); village Lower Rupal, 3100 m, *Nüsser 1583* (B!). – Ka: Faqirkot, 2800 m, *Hansen 40* (!); Kalapani, 3010 m, *Schickhoff 1285* (!); 3400 m, *Hansen 93a* (!). — ASTOR/KASHMIR: Kamri (Kazmi & Siddiqui 1953).

2400-3400 m / submont.-subalp.: forest, riverside (*Abies*) / W Himalaya: E Afgh. – NW India / W HIM / he.

Pedicularis pycnantha Boiss.

ASTOR: 3960 m, *Tanner* (Prain 1891). – Da: Doian, 2700-3000 m, *Troll 7208*; Harchu Valley, Baro Nirril >, 3160 m, *Nüsser 859* (B!). – As: Gudai, 2600 m, *Troll 7044*. – Ru: Tap Gl. right lateral moraine, 3580 m, *Nüsser 732* (B!). – Ka: Kalapani, *Giles* (Cat. Pak.); Rattu >, *R. R. Stewart* (“subsp. *semenovii*”, Cat. Pak.).

2600-3960 m / submont.-alp. / Iraq, Iran, Afgh., W Karakorum, NW Himalaya / IRAN / he. E limit of distribution.

Pedicularis pyramidata Royle (*P. pectinata* Wall. var. *pyramidata* (Royle) Hook. f., *P. kashmiriana* Pennell)

CHILAS: Babusar P., 4050-4100 m, *Miehe 466* (! det. Yamazaki). — ASTOR: (Cat. Pak.). – Ka: Faqirkot, 2980 m, *Schickhoff 1335* (!); 3220 m, *Schickhoff 1354* (!); Kalapani, *Giles* (“*P. kashmiriana*”, Cat. Pak.); 3050 m, *Schickhoff 1253* (!); 3500 m, *Giles* (Prain 1891); Kalapani Valley, 2800-3300 m, *Troll 7974*. — ASTOR/KASHMIR: Kamri P. (Cat. Pak.). — ASTOR/DEOSAI: Burzil P. (Cat. Pak.); Burzil P. – Deosai, *Falconer* (“*P. kashmiriana* var. *ornata*”, Cat. Pak.).

2800-4100 m / mont.-alp. / W Himalaya: E Afgh. – Kashmir, NW India, SW Karakorum / W HIM / he.

Pedicularis rhinanthoides Schrenk ex Fisch. & Mey.

CHILAS: Bu: Buldar Valley, Mamocha Peak <, 4200 m, *Troll 7854*. — ASTOR: Ru: Rupal Valley, *R. R. Stewart* (Cat. Pak.). – Ka: Rattu, *R. R. Stewart* (Cat. Pak.). — ASTOR/DEOSAI: Burzil P., *Koelz 9458* (Cat. Pak.).

4200 m / alp. / China, Mongolia, Tian Shan, Pamir, N Iran, Afgh., W Himalaya / C AS / he.

Pedicularis roylei Maxim.

ASTOR/DEOSAI: Burzil P., *R. R. Stewart* (Cat. Pak.).

Himalaya: Hazara – SE Tibet, W China / HIMAL / he.

***Pedicularis tenuirostris* Benth.**

ASTOR: Ka: Kalapani, *Giles 673* (Cat. Pak.); Kalapani Valley, 3200 m, *Troll 7992*. — ASTOR/KASHMIR: Kamri (Cat. Pak.). — ASTOR/DEOSAI: Burzil P. (Cat. Pak.). 3200 m / mont. / W Himalaya: Swat – Kashmir, NW India / W HIM / he.

***Picrorhiza kurrooa* Royle ex Benth. / kalikutki (u)**

ASTOR/KASHMIR: Kamri P., *Inayat 25732* (Pennell 1943, Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 18856* (NY, Cat. Pak., Pennell 1943); *R. R. Stewart 19084* (NY, Pennell 1943, Kazmi & Siddiqui 1953); Mir Panzil P., Deosai Rd., *R. R. Stewart 19945a* (Pennell 1943).

W Himalaya: Kashmir – Kumaon / W HIM / ch.

Medicinal.

[*Scrophularia calycina* Benth.]

ASTOR: Ka: Kalapani – Kamri P., 3700-4000 m, *Troll 8075*.

3700-4000 m / subalp.-alp. / W Himalaya: Kashmir – Nepal / W HIM / he.

Doubtful record.

***Scrophularia decomposita* Royle ex Benth. (*S. lucida* sensu Hook. f., non L.)**

ASTOR: Ka: Kalapani, *Inayat 25730c* (DD, ?, Pennell 1943); Kamri Valley, *Duthie* (DD, Pennell 1943); ? Shankargarh, *Inayat 25730a* (DD, Pennell 1943, “subsp. *latifolia*”, also cited under “*S. koelzii*”). — ASTOR/DEOSAI: Burzil, *Koelz 9443* (Pennell 1943); *Duthie 14034* (DD, Pennell 1943); *Duthie 13970* (DD, Pennell 1943).

W Himalaya: Afgh., Kashmir – Nepal / W HIM / he.

***Scrophularia dentata* Royle (*S. koelzii* Pennell, *S. nudata* Pennell, *S. variegata* auct., non (M. Bieb.) Hook. f.)**

CHILAS: Pa: Jiliper Valley, 3300 m, *Troll 7657* (“*S. variegata*”). — ASTOR: *R. R. Stewart 22843* (Cat. Pak.). – Da: Ramghat, 1200-1800 m, *Troll 7070* (“*S. variegata*”). – As: Gurikot, 2400-3000 m, *Troll 7349* (“*S. variegata*”). – Ru: Tap – Latobo, 3500-3600 m, *Troll 7414* (“*S. variegata*”); Tarishing (Cat. Pak.). – Ka: Kalapani, 3040 m (“*S. griffithii*”, Kazmi & Siddiqui 1953); Rattu >, *R. R. Stewart 22791* (“*S. koelzii*”, Cat. Pak.); *R. R. Stewart 18782* (Pennell 1943, Cat. Pak.); ? Shankargarh, *Inayat 25730a* (“*S. koelzii*”, Pennell 1943, also cited under *S. decomposita* subsp. *latifolia*).

1200-3600 m / coll.-subalp. / W Himalaya: E Afgh. – Uttar Pradesh / W HIM / he.

[*Scrophularia scabiosifolia* Benth. (*S. exserta* Pennell, *S. stewartii* Pennell)]

ASTOR: (Cat. Pak.). – Ka: Rattu, *Inayat 25730* (DD, ?, Pennell 1943).

W Himalaya: Afgh. – Kashmir / W HIM / he.

Doubtful, *Inayat*’s number is also cited under *S. decomposita* subsp. *latifolia* and *S. koelzii*.

[*Verbascum songaricum* Schrenk]

Ra: Jalipur, 1200 m, *Troll 7184*.

Coll. / Doubtful record.

***Verbascum thapsus* L. / romkot, ramkato (sh), bentamaku (u), Great Mullein (e)**

CHILAS: Go: Gor, 2690 m (*Schickhoff 1564*); 2900 m (*Dickoré*); 3230 m (*Schickhoff 1557*).

– Ra: Raikot Valley, Pungadori – Bezar, 3300 m, *Troll 7650*; Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 328* (B!). — ASTOR: 2130-3350 m (Kazmi & Siddiqui 1953). – Da: Harchu Valley, Baro Nirril >, 3120 m, *Nüsser 891* (B!); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 233* (B!). – As: Rama Forest (Kazmi & Siddiqui 1953). – Ru: Rupal Valley, Nagachakali, nunatak, 3620 m, *Nüsser 615* (B!). – Ka: Faqirkot, 2980 m (*Schickhoff 1326*); Kalapani, 3040 m (Kazmi & Siddiqui 1953); 3050 m, *Schickhoff 1281* (!); 3260 m (*Schickhoff 1215*); 3500 m, *Hansen 90* (!).

2130-3620 m / submont.-subalp.: dwarf scrub, forest, steppe-forest, turf (*Abies*, *Artemisia santolinifolia*, *Cedrus*, *Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / Europe, Asia / EURAS / th.

Medicinal.

Veronica alpina* subsp. *pumila (All.) Dostál (*V. alpina* var. *australis* Wahlenb., *V. pumila* All., *V. lasiocarpa* Pennell, *V. ciliata* auct., non Fisch.)

CHILAS: Babusar P. N, 3700 m, *Dickoré 12864* (!). – Ra: Raikot Gl., nunatak, BC, 4100 m, *Nüsser 482* (B!). – Bu: Buldar Valley, Mamocha Peak <, 4200 m, *Troll 7852* (*V. ciliata*). — ASTOR/KASHMIR: Kamri P., *R. R. Stewart 1866b* (Pennell 1943). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 18999* (GH, NY, RAW, Pennell 1943).

3700-4200 m / subalp.-alp.: avalanche path, scree / C. & S Europe, Siberia, Karakorum, W Himalaya / EURAS / he.

***Veronica anagallis-aquatica* L.** / Blue Water-speedwell (e)

CHILAS: Pa: Pattaro Valley, Zangal, 2650 m, *Troll 7690*. — ASTOR: As: Chillam, *R. R. Stewart 18994* (“*V. secunda*”, Cat. Pak., Pennell 1943); Das Kirim, *R. R. Stewart 22016* (“*V. secunda*”, Cat. Pak.). – Ka: Rattu, 2800 m, *Miehe 950404b* (!).

2650-2800 m / submont. / N Africa, Europe, Asia / EURAS / th.

Possibly all referable to *V. anagallis-aquatica* subsp. *michauxii* (Lam.) A. Jelen. (“*V. secunda* Pennell”).

***Veronica beccabunga* L.** / Brooklime (e)

ASTOR: As: Astor, 2310 m (Kazmi & Siddiqui 1953); Rama (Kazmi & Siddiqui 1953). – Ru: Bazhin Lake, 3520 m, *Nüsser 1* (B!); Tarishing, 2700-3000 m, *Troll 7386*. – Ka: Kalapani, 3010 m, *Schickhoff 1290* (!); Rattu, 2800 m, *Miehe 950404a* (!).

2310-3520 m / mont.-subalp.: fen, flush / N Africa, Europe, Asia / EURAS / he.

Medicinal.

***Veronica biloba* L.**

CHILAS: Go: Gor, 2500-3000 m, *Troll 7142*. – Pa: Diamir Valley, 2970 m, *Schickhoff 2434* (!). – Ra: Raikot Valley, Bayal, 3600 m, *Nüsser 1280b* (B!). — ASTOR: Da: Doian, 2700-3200 m, *Troll 7234*. – Ru: Latobo S, 3950 m, *Nüsser 71* (B!, cf.); Tap Gl. right lateral moraine, 3580 m, *Nüsser 733* (B!, cf.). – Ka: Kalapani, 3050 m, *Schickhoff 1264* (!); 3260 m, *Schickhoff 1206b* (!); 3260 m, *Schickhoff 1210* (!); Rattu, 2600 m, *Troll 7378*. — ASTOR/DEOSAI: Burzil Chowki, *R. R. Stewart 19776* (NY, RAW, Pennell 1943).

2500-3950 m / submont.-alp.: dwarf scrub, forest, meadow (*Abies*, *Artemisia santolinifolia*, *Cedrus*, *Pinus wallichiana*) / W & C. Asia, W Himalaya / IRAN / th.

Veronica lanosa Royle ex Benth. (*V. deltigera* Wall., *V. rupestris* Aitch. & Hemsley)
 ASTOR: Ka: Faqirkot, 3100 m, *Schickhoff 1377* (!); Kalapani Valley, 2700-3000 m, *Troll 7984*. — ASTOR/KASHMIR: Kamri P., *R. R. Stewart 18666* (GH, NY, US, Pennell 1943). —
 ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19100a* (GH, NY, RAW, Pennell 1943); *R. R. Stewart 19045* (DD, Pennell 1943); Mir Panzil P., *R. R. Stewart 19912a* (Pennell 1943).
 2700-3100 m / mont.: avalanche path / W Himalaya: E Afgh. – Uttar Pradesh / W HIM / he.

[*Veronica polita* Fries (*V. didyma* auct., non Tenore, *V. agrestis* auct., non L.)]

ASTOR: (“*V. didyma*”, Cat. Pak.).

N & E Africa, Europe, Asia, N & S America, Tasmania / CIRC POL / th.

Possible, but to be confirmed.

[*Veronica verna* L.]

ASTOR: As: Rama, *E. Nasir & Webster 6495* (Cat. Pak.).

Europe, W & SW Asia, Kashmir / EURAS / ge.

Possible, but to be confirmed.

Simaroubaceae

● ***Ailanthus altissima*** (Miller) Swingle (*A. glandulosa* Desf.) / Tree of Heaven (e)

CHILAS: Chilas, 1200 m (*Dickoré*); Chilas – Babusar, 1200-1330 m (*Dickoré*); Gunar Farm, 1160 m (*Dickoré*). — ASTOR: Da: Doian, 2050 m (*Dickoré*).

1160-2050 m / coll.-submont.: irrigation, roadside, rock / China (widely cultivated and naturalised) / ph.

Commonly planted (?and naturalising) along Karakorum Highway and in villages.

Solanaceae

Datura stramonium L. / Thorn Apple (e)

CHILAS: Go: Gor, 2160 m (*Dickoré*). — ASTOR: (Cat. Pak.). – Da: Dashkin – Astor, 2090 m (*Dickoré*); Doian (Kazmi & Siddiqui 1953). – As: Astor (Kazmi & Siddiqui 1953); Gurikot (Kazmi & Siddiqui 1953). – Ka: Rattu (Kazmi & Siddiqui 1953).

2090-2160 m / submont.: ruderal / trop. America (introduced cosmopolitan) / COSMO / th.

Medicinal.

Hyoscyamus niger L. / bazarbang (sh), ajwain khurasani (u), Black Henbane (e)

CHILAS: Pa: Diamir, *H. Jahan* (ISL, Fl. Pak. 168). — ASTOR: *Duthie 12486* (E, Fl. Pak. 168). – As: Gurikot (Kazmi & Siddiqui 1953); Rama Valley, *Lankester & Pearson 1277* (BM, Fl. Pak. 168); Rampur (Kazmi & Siddiqui 1953). – Ka: Faqirkot (Kazmi & Siddiqui 1953); 2800 m, *Hansen 42* (!); Rattu (Kazmi & Siddiqui 1953).

2800 m / mont. / N Africa, Europe, Asia, N America / CIRC POL / th.

Medicinal, poisonous.

Hyoscyamus pusillus L.

ASTOR: Da: Ramghat, 1500-1900 m, *Troll 7202*.

1500-1900 m / coll. / SE Europe, SW & C. Asia, Siberia, Mongolia / C AS / th.
Also along the Indus to Skardu and Ladakh.

● *Lycopersicon esculentum* Mill. / Tomato (e)

CHILAS: Go: Gor, 2000 m (*Dickoré*).

2000 m / submont. / cultivated worldwide (C. & S America) / th.

Cultivated on a small scale in gardens at relatively low altitudes.

Physochlaina praealta (D. Don) Miers (*Scopolia praealta* Dunal)

ASTOR: Da: Doian – Ramghat, *Conway 336* (Cat. Pak.). – As: Gurikot, *R. R. Stewart* (Cat. Pak.); Gurikot – Bulashbar, 2400 m, *Troll 7366*.

2400 m / submont.: ruderal, scree / S Karakorum, Ladakh, Himalaya, S Tibet / W HIM / ge.

Solanum nigrum L. / mako, kach-mach (u), Black Nightshade (e)

CHILAS: Chilas – Babusar, 1140 m (*Dickoré*). — ASTOR: As: Astor Bazar, Hotel, 2440 m, *Dickoré 12812* (!); Rama Valley, *Lankester & Pearson 1419* (BM, “var. *nigrum*”, Fl. Pak. 168).

1140-2440 m / coll.-submont.: ruderal / cosmopolitan / COSMO / th.

Medicinal.

Solanum surattense Burm. f. (*S. xanthocarpum* Schrader & Wendl.) / kundiyari, momoli, mokri (u)

CHILAS: Go: Thelichi, 1260 m, *Dickoré 12525* (!); 1300 m, *Troll 7092*. – Bu: Muthat – Raikot Bridge, 1440 m, *Nüsser 1067* (B!).

1260-1440 m / coll.: desert, semi-desert, wet places by spring / N Africa, S & SE Asia, Himalaya, Australia / SUBTROP / ch.

Medicinal; N limit of distribution.

● *Solanum tuberosum* L. / aalu, desi alu, sarkari alu, sheo alu (sh), Potato (e)

CHILAS: Babusar Village, 2800 m (*Dickoré*). – Go: Gor, 2000 m (*Dickoré*). — ASTOR: Da: Doian, 2600 m (*Dickoré*). – As: Rampur (Kazmi & Siddiqui 1953).

2000-2800 m / submont.-mont. / cultivated worldwide (S America) / ge.

Commonly cultivated, does well at high altitudes.

Withania somnifera (L.) Dunal / aksan (u)

ASTOR: Da: Ramghat, 1670 m, *Duthie 12309* (BM, Fl. Pak. 168).

1670 m / coll. / Canaries, Medit., SW Asia, Pakistan, India / MEDIT / he.

Medicinal, N limit of distribution.

Tamaricaceae

Myricaria germanica subsp. *alopecuroides* (Schrenk) Kitam. (*M. bracteata* Royle) / hukur (sh)

CHILAS: Babusar Village < 10 miles, *S. Abedin & M. Qaiser 9053* (KUH, Fl. Pak. 141). – Ra: Raikot Gl. tongue, 3230 m, *Nüsser 1006* (B!). — ASTOR: *R. R. Stewart* (Cat. Pak.);

Lankester & Pearson 1289 (BM, Fl. Pak. 141); *Schlagintweit* (Cat. Pak.). – As: Gurikot, 2400 m, *Troll 7554*. – Ru: Latobo, 3600 m, *Troll 7406*. – Ka: Faqirkot, 2800 m; *Hansen 114* (!); Rattu >, 2890 m, *R. R. & I. D. Stewart 18771* (RAW, Fl. Pak. 141). 2400-3600 m / submont.-subalp. / C. Asia, Karakorum, W Himalaya, SW Tibet (*M. germanica* subsp. *germanica*: Europe, Asia) / C AS / np.

Tamarix ramosissima Ledeb.

CHILAS: Go: Thelichi, 1300 m, *Troll 7090* (“var. *pallasii*”). 1300 m / coll. / C., S & E Asia: Iran – Pakistan, Mongolia, China, Korea / C AS / np.

Thymeleaceae

Daphne mucronata Royle (*D. angustifolia* C. Koch, *D. oleoides* auct., non Schreb.) / nirko, nik (sh), kuttibel, kuttikal (u)

CHILAS: Go: Gor, 1230-2650 m (*Dickoré*); 2420 m, *Dickoré 12650* (!); 2690 m, *Schickhoff 1563* (!); Gor, Hapareng, 1950 m, *Nüsser 1208* (B!); Gor, Martal, 2920 m, *Nüsser 1160* (B!); Gor, Martal <, 2150 m, *Nüsser 1185* (B!); 2540 m, *Nüsser 1183* (B!); 2750 m, *Nüsser 1164* (B!). – Ra: Tato – Fairy Meadows, 2480 m, *Nüsser 964* (B!); Tato – Fary, 2540 m, *Nüsser 1011* (B!). – Bu: Muthat – Raikot Bridge, 2350 m, *Nüsser 1047* (B!). — ASTOR: (Cat. Pak.). – Da: Doian <, 1660 m, *Nüsser 711* (B!); Harchu, 2100 m, *Troll 7278*; Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 235* (B!); Ramghat, 1200-1800 m, *Troll 7059*. – As: Chongra – Gan, 2400 m, *Hansen 181* (!); Gudai (Kazmi & Siddiqui 1953). 1200-2920 m / coll.-mont.: scrub, steppe-forest (*Juniperus excelsa*, *Pinus gerardiana*, *Quercus*) / W Himalaya: Afgh. – Garhwal / W HIM / ch. Medicinal, poisonous.

Diarthron vesiculosum (Fisch. & C. A. Mey.) C. A. Mey. (*Passerina vesiculosa* Fisch. & C. A. Mey.)

ASTOR: (Cat. Pak.).
E Europe, SW Asia, Tian Shan, Pamir, W Himalaya / IRAN / th.

Ulmaceae

Celtis caucasica Willd.

CHILAS: Go: Gor, 2300 m, *Troll 7158*. 2300 m / submont. / SW Asia: Caucasus – Iran, Afgh., Pamir, W Himalaya: Chitral – Nepal / IRAN / ph. Also rare in Gilgit.

Umbelliferae (Apiaceae)

Aegopodium kashmiricum (R. R. Stewart ex Dunn) Pimenov (*A. alpestre* auct., non Ledeb., *Pimpinella kashmirica* R. R. Stewart ex Dunn, *A. tadshikorum* Schischk.)

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12627* (!). — ASTOR: Ka: Kalapani, 3260 m, *Schickhoff 1214* (!); Rattu, *Duthie 12513* (“*A. alpestre*”, Cat. Pak.).

2950-3260 m / mont.: forest (*Abies*, *Picea*, *Pinus wallichiana*) / Tian Shan, Pamir, SW Karakorum, W Himalaya / PAMIR / he.

Angelica archangelica L. (? *Archangelica oreadum* Diels) / Garden Angelica (e)

ASTOR: As: Chillam – Gurikot, *M. A. Siddiqi & Y. Nasir* 4166 (“*Archangelica oreadum*”, Cat. Pak.); Gudai – Chillam, *M. A. Siddiqi & Y. Nasir* (RAW, “var. *himalaica*”, Fl. Pak. 20); *E. Nasir & Webster* 6514 (GH, RAW, “var. *himalaica*”, Fl. Pak. 20). – Ka: Rattu – Kalapani, 2800-3200 m, *Troll* 7976 (B, type of *Archangelica oreadum*; destroyed). — ASTOR/DEOSAI: Burzil ascent, 3500 m, *R. R. Stewart* 19215 (K, RAW, “var. *himalaica*”, Fl. Pak. 20).

2800-3500 m / mont.-subalp. / Europe, W Asia; W Himalaya / EURAS / he.

Medicinal. *Archangelica oreadum* Diels is tentatively included here.

Angelica glauca Edgew. / choro (sh)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir* 2759 (RAW, Fl. Pak. 20). — ASTOR: As: Gudai (Kazmi & Siddiqui 1953). – Ka: Kalapani Valley, 3300 m, *Troll* 8012; Kamri Valley (Cat. Pak.). — ASTOR/KASHMIR: Kamri P., *Duthie* 12523 (E, Fl. Pak. 20). — ASTOR/DEOSAI: Sochar P., *E. Nasir & Webster* 6393 (GH, K, RAW, Fl. Pak. 20).

3300-3960 m / mont.-alp. / W Himalaya: Afgh. – NW India / W HIM / he.

Anthriscus nemorosa (M. Bieb.) Spreng.

ASTOR: (Cat. Pak.); *R. R. Stewart* 22724 (“var. *glabriuscula*”, Cat. Pak.). – As: Gurikot Valley, 3400 m, *Troll* 7523. – Ka: Kalapani, *Giles* 178 (Fl. Pak. 20); Kalapani Valley, 3200 m, *Troll* 8008. — ASTOR/KASHMIR: Kamri P. (“var. *glabriuscula*”, Cat. Pak.). — ASTOR/DEOSAI: Deosai – Chillam, *E. Nasir & Webster* 6393 (GH, RAW, Fl. Pak. 20).

3200-3400 m / mont.-subalp. / S Europe, Turkey, Caucasus – Pakistan, India – Japan / IRAN / he.

Bunium persicum (Boiss.) B. Fedtsch. (*Carum persicum* Boiss., *C. bulbocastanum* auct., non *C. Koch*) / kino hayo (sh), zira seyah (u)

CHILAS: Babusar Village, *M. A. Siddiqi & Y. Nasir* 2790 (RAW, Fl. Pak. 20). – Go: Gor > NW, 2840 m, *Dickoré* 12602 (!). – Pa: Pattaro Valley, Zangal, 2400-2600 m, *Troll* 7685. – Ra: Tato – Fary, 2540 m, *Nüsser* 1012 (B!). – Bu: Muthat – Raikot Bridge, 2830 m, *Nüsser* 1040 (B!). — ASTOR: Da: Mushkin, 2000-2200 m, *Troll* 7263; Mushkin Forest, RH – Dashkin, 2660 m, *Nüsser* 274 (B!). – As: Astor (Kazmi & Siddiqui 1953). – Ka: Rattu, 2740 m (Kazmi & Siddiqui 1953); Rattu >, *R. R. & I. D. Stewart* 18787 (RAW, Fl. Pak. 20).

2000-2840 m / submont.-mont.: steppe-forest (*Pinus gerardiana*) / N Africa, S Europe – Afgh., W Pakistan / IRAN / ge.

Medicinal.

Specimens from the area recently referred to *B. hissaricum* Korovin by Pimeno (in litt.).

Bupleurum aitchisonii (Boiss.) Wolff

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir* 2767 (RAW, Fl. Pak. 20).

3960 m / alp. / W Himalaya: E Afgh. – N Pakistan / W HIM / he.

***Bupleurum canaliculatum* Diels**

CHILAS: Go: Gor, 2900 m (*Dickoré*); Gor > NW, 2840 m, *Dickoré 12603* (!). – Pa: Jiliper Valley, 2800-3200 m, *Troll 7669* (B, type of *B. canaliculatum*, destroyed). — ASTOR: Da: Mushkin RH > SE, 2680 m, *Dickoré 12756* (!); Turbaling – Doian, 2650 m, *Dickoré 12820* (!). – As: Gurikot – Bulashbar, 2600 m, *Troll 7375*. – Ka: Rattu >, 2740 m, *R. R. & I. D. Stewart 18837* (GH, NY, RAW, US neotype of *B. canaliculatum*, Fl. Pak. 20). 2600-3200 m / submont.-mont.: dwarf scrub, forest, steppe-forest (*Artemisia brevifolia*, *Astragalus strobiliferus*, *Krascheninnikovia*, *Pinus gerardiana*, *Pinus wallichiana*) / NW Himalaya (Astor, Chilas) / ENDEM / he.

***Bupleurum clarkeanum* (Wolff) E. Nasir**

ASTOR: Ru: Rupal Valley, 3300 m, *Nüsser 107* (B!); Rupal Valley, Rupal Gl. ablation valley, 3950 m, *Nüsser 1552* (B!); village Lower Rupal, 3100 m, *Nüsser 1595* (B!). 3100-3950 m / mont.-alp. / Astor, Kashmir / ENDEM / he.

[*Bupleurum exaltatum* M. Bieb. (*B. falcatum* subsp. *exaltatum* (M. Bieb.) Briq.)]

ASTOR: (Cat. Pak.).

S Europe, SW Asia / EURAS / ch.

In Pakistan apparently known only from Baluch. and Chitral; record may refer to *B. hoffmeisteri*.

[*Bupleurum falcatum* subsp. *marginatum* Wall. ex DC.]

ASTOR: As: Gurikot – Bulashbar, 2400-2500 m, *Troll 7369*.

2400-2500 m / submont. / W Himalaya: Kashmir – Bhutan / W HIM / he.

Possibly identical with *B. hoffmeisteri*.

As *B. marginatum* DC. by Pimenov (in litt.).

***Bupleurum gracillimum* Klotzsch (*B. falcatum* var. *gracillimum* (Klotzsch) Wolff, *B. falcatum* var. *nigrocarpum* Jacquem. ex C. B. Clarke)**

CHILAS: Go: Gor, 3520 m, *Schickhoff 1491* (!).

3520 m / subalp.: scrub / SW Karakorum, W Himalaya: Chitral – NW India / W HIM / he.

***Bupleurum hoffmeisteri* Klotzsch & Garcke**

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2824* (RAW, Fl. Pak. 20). – Pa: Jiliper Valley, 2800-3200 m, *Troll 7670*. – Bu: Muthat, 2960 m, *Nüsser 1037* (B!). — ASTOR: (Cat. Pak.). – Da: Mushkin Forest, 2900 m, *Schickhoff 1395* (!); 3000 m, *Schickhoff 1423* (!). – As: Chillam – Gudai, *E. Nasir & Webster 6411* (GH, RAW, Fl. Pak. 20); *E. Nasir & Webster 6413* (GH, RAW, Fl. Pak. 20).

2800-3960 m / mont.-alp.: forest (*Pinus wallichiana*) / SW Karakorum, W Himalaya / W HIM / he.

Close to the Eurasiatic *B. falcatum*.

Specimens from the area recently referred to *B. marginatum* DC. by Pimenov (in litt.).

[*Bupleurum linearifolium* DC. (*B. exaltatum* var. *linearifolium* (DC.) Boiss.)]

ASTOR: (Cat. Pak.).

SW Asia / IRAN / he.

Belongs to the *B. falcatum* group, possibly to *B. hoffmeisteri*.

Bupleurum longicaule Wall. ex DC.

ASTOR: Ka: Rattu, 2700 m, *Troll 7965*. — ASTOR/DEOSAI: Burzil P. (“var. *himalayense*”, Cat. Pak.); Burzil Valley (Cat. Pak.); Burzil, Sardar Kothi nr., *R. R. Stewart & E. Nasir 21996* (RAW, “var. *himalayense*”, Fl. Pak. 20); Chillam – Sochar P., 3810 m, *E. Nasir & Webster 6525* (GH, RAW, “var. *himalayense*”, Fl. Pak. 20).

2700-3810 m / mont.-subalp. / W Himalaya: Kashmir – Bhutan / W HIM / he.

[*Bupleurum microcephalum* Diels]

ASTOR: Da: Dashkin (Cat. Pak.).

Identity unknown.

Bupleurum swatianum Nasir (*B. jucundum* var. *cachemirica* C. B. Clarke)

ASTOR: (“*Bupleurum jucundum* var. *cachemirica*”, Cat. Pak.). — ASTOR/KASHMIR: Kamri P. <, *R. R. & I. D. Stewart 18626* (RAW, Fl. Pak. 20).

W Himalaya: Swat, Gilgit, Astor / ENDEM / he.

[*Bupleurum tenue* Ham. ex D. Don]

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1754* (!, cf.).

2750 m / mont.: forest (*Cedrus*) / W Himalaya: E Afgh. – Nepal / W HIM / he.

Bupleurum thomsonii C. B. Clarke

CHILAS: Ra: Fary, 3200 m, *Troll 7817*. — ASTOR: As: Rama, *R. R. Stewart & E. Nasir 22945a* (RAW, Fl. Pak. 20); *E. Nasir & Webster 6432* (GH, RAW, Fl. Pak. 20); Rama – Gurikot, *R. R. Stewart 22950* (Cat. Pak.); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1040* (!). — Ru: Rupal Valley, *R. R. Stewart & E. Nasir 22830b* (RAW, Fl. Pak. 20); Zaipur >, 3120 m, *Schickhoff 1067* (!). — Ka: Faqirkot, 2980 m, *Schickhoff 1322* (!). — ASTOR/KASHMIR: Kamri P. (Cat. Pak.). — ASTOR/DEOSAI: Burzil P. (Cat. Pak.); Chillam – Sochar P., *E. Nasir & Webster 6526* (GH, RAW, Fl. Pak. 20); Deosai – Chillam, *E. Nasir & Webster 6403* (GH, RAW, Fl. Pak. 20).

2980-3200 m / mont.: forest (*Abies*, *Picea*, *Pinus wallichiana*) / Himalaya: N Pakistan, N India / HIMAL / he.

Carum carvi L. / zirah (sh), Caraway (e)

CHILAS: Babusar Village, 3650 m, *M. A. Siddiqi & Y. Nasir 2781* (RAW, Fl. Pak. 20). — Go: Gor, Martal, 2970 m, *Nüsser 1152* (B!). — ASTOR: (Cat. Pak.). — Da: Doian, *A. H. Khan* (PPFI-B, Fl. Pak. 20). — As: Rama, *A. H. Khan* (PPFI-B, Fl. Pak. 20). — Ru: Bazhin Lake, 3520 m, *Nüsser 5* (B!). — ASTOR/DEOSAI: Chillam Chowki, *M. A. Siddiqi & Y. Nasir 4167* (RAW, Fl. Pak. 20).

2970-3650 m / mont.-subalp.: meadow, moist, riverside, ruderal, tuf / N Africa, Europe, Asia / EURAS / he.

Used for flavouring and as an aromatic carminative, economically important (Nüsser 1998).

Chaerophyllum villosum Wall. ex DC. (? *C. acuminatum* Lindl., ? *C. reflexum* Lindl.)

ASTOR: (“*C. reflexum*”, Cat. Pak.). — Ka: Kalapani, 3050 m, *Schickhoff 1274* (!, “*C. reflexum* var. *acuminatum*”); Kalapani Valley, 3200 m, *Troll 8046*. — ASTOR/DEOSAI: Burzil Chowki, 1940-07-27, *R. R. Stewart* (RAW, “*C. villosum*”, Fl. Pak. 20); Burzil P., 3350-

3650 m, *R. R. Stewart 19111* (RAW, Fl. Pak. 20); Deosai – Chillam, *E. Nasir & Webster* (GH, RAW, “*C. villosum*”, Fl. Pak. 20).

3050-3650 m / mont.-subalp.: dwarf scrub (*Artemisia santolinifolia*) / Himalaya: Afgh. – Bhutan / HIMAL / he.

Edible carrot-like roots.

W Himalayan specimens recently referred to *C. acuminatum* Lindl. by Pimenov (in litt.).

● ***Coriandrum sativum* L.** / Coriander (e)

CHILAS: Ra: Tato, 2400 m, *Troll 7806*. — ASTOR: As: Rama – Gurikot, *R. R. & I. D. Stewart 21950a* (RAW, Fl. Pak. 20).

2400 m / submont. / cultivated and possibly naturalising / th.

[*Cuminum cyminum* / zira (u)]

ASTOR: Ka: Rattu, 2740 m (Kazmi & Siddiqui 1953).

2740 m / mont. / Record to be confirmed, cultivated? Medicinal.

***Daucus carota* L.** / Wild Carrot (e)

CHILAS: Go: Gor, 2000-2160 m (*Dickoré*).

2000-2160 m / submont. / almost cosmopolitan / COSMO / th.

***Ferula narthex* Boiss.** (*Narthex asafoetida* Falc.) / sap (sh), anjudan (u)

ASTOR: 1921-09, *Coventry* (BM, Fl. Pak. 20). – Da: Doian, *Aitchison* (K, Fl. Pak. 20); 1900-2700 m, *Troll 7215*; Harchu Valley (Kazmi & Siddiqui 1953). – As: Gudai, *Aitchison* (K, Fl. Pak. 20); Gurikot – Bulashbar, 2400-2800 m, *Troll 7374*. – Ru: Boosthon [?Bulashbar], *Falconer* (K, type of *Narthex asafoetida*, Fl. Pak. 20). – Ka: Faqirkot (Kazmi & Siddiqui 1953); Rattu, 2740 m (Kazmi & Siddiqui 1953); Shankargarh (Kazmi & Siddiqui 1953).

1900-2800 m / coll.-mont. / Kurram, Astor / ENDEM / he.

Medicinal.

***Heracleum candicans* Wall.** ex DC.

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2823* (RAW, Fl. Pak. 20). – Go: Gor, Martal, 2930 m, *Nüsser 1085* (B!). – Ra: Fairy Meadows, 3300 m, *Troll 7629*. — ASTOR: Ru: Village Lower Rupal, 3100 m, *Nüsser 1589* (B!). – Ka: Kalapani Valley, 3200 m, *Troll 8007*. — ASTOR/DEOSAI: Chillam – Sochar P., *E. Nasir & Webster 6520* (GH, RAW, Fl. Pak. 20).

2930-3960 m / mont.-alp. / Himalaya: Kashmir – SW China / HIMAL / he.

***Heracleum canescens* Lindl.** (*H. hirsutum* Edgew.)

CHILAS: Ra: Raikot Valley, 3230 m, *Schickhoff 1624* (!). — ASTOR: Ru: Gageh, 3070 m, *Nüsser 771* (B!). – Ka: Faqirkot, 2980 m, *Schickhoff 1324* (!).

2980-3230 m / mont.: forest (*Pinus wallichiana*) / W Himalaya: Kashmir – Kumaon, ?Nepal / W HIM / he.

***Heracleum pinnatum* C. B. Clarke** (*H. multibracteatum* Rech. f. & Riedl)

ASTOR: (Cat. Pak.). – As: Gurikot, 2500 m, *Troll 7559*. — ASTOR/DEOSAI: Chillam >, *R. R.*

Stewart 18963 (RAW, Fl. Pak. 20).

2500 m / submont. / Karakorum, W Himalaya / W HIM / he.

Ligusticum marginatum C. B. Clarke

ASTOR: Ka: Kalapani Valley, 3300 m, *Troll 8029*.

3300 m / mont. / W Himalaya: E Afgh. – Uttar Pradesh / W HIM / he.

Ligusticum thomsonii C. B. Clarke

CHILAS: Pa: Jiliper Valley, 2800-3200 m, *Troll 7665* (“var. *glabrior*”). – Ra: Raikot Valley, Kilo Sagar, 3700-4000 m, *Troll 7786*; Raikot Valley, Pungadori Lake, 3300 m, *Nüsser 349* (B!). – Bu: Lichar Valley, 3000-3500 m, *Troll 7574*. — ASTOR: As: Astor Bazar, 2400 m, *Troll 7931*; Gurikot <, 2300 m, *Troll 7348* (“var. *glabrior*”). — ASTOR/KASHMIR: Kamri, R. R. *Stewart 18728* (RAW, “var. *evolution*”, Fl. Pak. 20).

2300-4000 m / submont.-alp. / Himalaya: N Pakistan, N India / HIMAL / he.

Pimpinella diversifolia (Wall.) DC.

CHILAS: Ra: Fairy Meadows, 3300 m, *Troll 7826*. — ASTOR: Da: Doian, 3000 m, *Troll 7560*; Harchu Valley, Karmi Haray, 2740 m, *Nüsser 827* (B!); Mushkin Forest, 2580 m, *Schickhoff 1124* (!); 2700 m, *Troll 7891*; Mushkin RH <, 2580 m, *Dickoré 12723* (!). – As: Astor Bazar, 2400 m, *Troll 7935*. – Ka: Kalapani Valley, 3300 m, *Troll 8017*.

2400-3300 m / submont.-mont.: forest, hay meadow (*Pinus wallichiana*, *Salix wallichiana*) / Himalaya: Afgh. – Assam, China, Taiwan, Japan / HIMAL / he.

Pleurospermum candollei (DC.) C. B. Clarke (*Hymenolaena candollei* DC.)

ASTOR/KASHMIR: Kamri P., 4000 m, *Troll 8052*.

4000 m / alp. / W Himalaya: E Afgh. – NW India, SW Karakorum / W HIM / he.

Pleurospermum stylosum C. B. Clarke (*Aulacospermum stylosum* (C. B. Clarke) Rech. f. & Riedl)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2817* (RAW, Fl. Pak. 20). – Bu: Buldar Valley, Mamocha Peak <, 3800-4000 m, *Troll 7861*. — ASTOR: Ru: Rupal Ridge, 3500 m, *Troll 7469*.

3500-4000 m / subalp.-alp. / Himalaya: Afgh. – NW India / HIMAL / he.

Prangos pabularia Lindl. (*Koelzella pabularia* Hiroe) / palangus (sh), badiyane khatai, komal (u)

ASTOR: (Cat. Pak.). – As: Chillam – Gudai, *E. Nasir & Webster 6417* (GH, RAW, Fl. Pak. 20). – Ka: Faqirkot, 2800 m, *Hansen 50* (!); Rattu – Kalapani, 2800 m, *Troll 7971*. — ASTOR/KASHMIR: Kamri, 1892-08-24, *Duthie* (E, Fl. Pak. 20).

2800 m / mont. / Pamir, Afgh., Baluch., W Himalaya / PAMIR / he.

Medicinal.

Schulzia dissecta (C. B. Clarke) Norman (*Ligusticum balistanicum* Wolff, *Trachydium dissectum* C. B. Clarke)

CHILAS: Babusar P., 4300 m, *Miehe 517* (!); Babusar P. N, 3700 m, *Dickoré 12853* (!). – Go: Gor, Kahlmimay >, 3770 m, *Nüsser 1106* (B!, cf.). – Pa: Pattaro Valley, Guttum Sagar,

4490 m, *Nüsser 1368* (B!). – Ra: Raikot Gl., nunatak, BC, 3900 m, *Nüsser 1304* (B!); 4100 m, *Nüsser 483* (B!, cf.); 4300 m, *Nüsser 492* (B!); 4300 m, *Nüsser 494* (B!, cf.); 4400 m, *Nüsser 502* (B!, cf.). — ASTOR: *R. R. Stewart* (Cat. Pak.). – As: Burzil P. N, *R. R. & I. D. Stewart 19039* (RAW, Fl. Pak. 20); Rama Ridge, 4000 m, *Nüsser 216* (B!); 4000 m, *Nüsser 218* (B!). – Ru: Latobo S, 4150 m, *Nüsser 88* (B!); Mazeno High Camp, ascent, 4600 m, *Nüsser 1496* (B!). — ASTOR/DEOSAI: Burzil, *R. R. Stewart 22080* (K, UC, Fl. Pak. 20); *R. R. Stewart 22984* (K, UC, Fl. Pak. 20); Burzil top (Cat. Pak.). 3700-4600 m / subalp.-subniv.: avalanche path, rocky slope, scree / SW Karakorum, W Himalaya: N Pakistan, N India / W HIM / he. Specimens from the area recently identified as the *C. asiatic S. albiflora* (Kar. & Kir.) Popov by Pimenov (in litt.).

Selinum candollei DC. (? *S. tenuifolium* Wall. ex C. B. Clarke)

CHILAS: Pa: Jiliper Valley, 3000 m, *Troll 7675*. — ASTOR/KASHMIR: Kamri P., *Duthie 12573* (“*S. tenuifolium*”, Cat. Pak.). 3000 m / mont. / Himalaya: Kashmir – Sikkim / HIMAL / he.

Selinum papyraceum C. B. Clarke (*Cortia papyracea* (C. B. Clarke) Leute)

ASTOR: (Cat. Pak.). – As: Chillam – Gudai, 2740 m, *E. Nasir & Webster 6419* (GH, RAW, Fl. Pak. 20). — ASTOR/DEOSAI: Burzil P., 3650-3960 m, *R. R. Stewart & E. Nasir 22103* (K, RAW, UC, Fl. Pak. 20). 2740-3960 m / mont.-alp. / Pamir, W Himalaya: E Afgh. – Nepal, Sikkim / HIMAL / he.

Selinum vaginatum (Edgew.) C. B. Clarke

ASTOR/DEOSAI: Burzil P., 3650 m, *R. R. & I. D. Stewart 19013a* (RAW, Fl. Pak. 20). 3650 m / subalp. / W Himalaya: N Pakistan, NW India / W HIM / he.

Semenovia lasiocarpa (Boiss.) Manden. (*Heracleum thomsoni* C. B. Clarke, *Platytaenia lasiocarpa* (Boiss.) Rech. f. & Riedl)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2770* (RAW, “var. *glabrior*”, Fl. Pak. 20). — ASTOR: (Cat. Pak.). – As: Chillam – Gudai, 2740 m, *E. Nasir & Webster 6412* (GH, RAW, “var. *glabrior*”, Fl. Pak. 20). – Ru: Rupal Valley, *E. Nasir & Webster 6504* (GH, RAW, “var. *glabrior*”, Fl. Pak. 20). 2740-3960 m / mont.-alp. / NW Himalaya: Afgh. – NW India / W HIM / ch. More common in the inner ranges of S Karakorum.

Seseli libanotis (L.) Koch / kur shadun, butte jad, laskur (sh), Moon Carrot (e)

CHILAS: Go: Gor > NW, 2770 m, *Dickoré 12587* (!). – Ra: Raikot Gl. – Ganalo Gl. confluence, 3890 m, *Nüsser 296* (B!); 3900 m, *Nüsser 289* (B!). – Bu: Muthat, 2900 m, *Troll 7843*. — ASTOR: (Cat. Pak.); *Giles 571* (K, Fl. Pak. 20). – Da: Harchu Valley, Baro Nirril >, 3230 m, *Nüsser 879* (B!); Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 232* (B!). – As: Chongra, 3000 m, *Hansen 203* (!); 3000 m, *Hansen 210* (!); Gudai – Gurikot, *E. Nasir & Webster 6425* (GH, RAW, Fl. Pak. 20). – Ka: Faqirkot, 2700 m, *Hansen 228* (!). 2700-3900 m / mont.-alp.: rock, steppe-forest (*Pinus gerardiana*) / Europe, Asia / EURAS / he. Specimens from the area recently referred to *S. buchtormense* (Spreng.) W. D. J. Koch by Pimenov (in litt.).

Sium latijugum C. B. Clarke

CHILAS: Babusar Valley, Jal – Nagat, 2050 m, *Dickoré 12823* (!). – Ra: Tato, 2500 m, *Troll 7827*.

2050-2500 m / submont.: flush, meadow / W Himalaya: E Afgh. – Kashmir, NW India, SW Karakorum / W HIM / he.

Considered a synonym of the C. Asiatic *S. medium* C. A. Mey. by Pimenov (in litt.).

Trachydium roylei Lindl.

CHILAS: Babusar top, 1969-08-23, *Saeed* (PPFI-B, Fl. Pak. 20). – Pa: Pattaro Valley, 3900-4300 m, *Troll 7715*; 4300-4500 m, *Troll 7719*. – Ra: Raikot Gl., nunatak, 4210 m, *Nüsser 405* (B!); Raikot Gl., nunatak, BC, 4000 m, *Troll 7754*; 4000 m, *Troll 7755*. – Bu: Buldar Valley, Mamocha Peak <, 4000-4200 m, *Troll 7867*; 4200 m, *Troll 7849*. — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19056* (RAW, Fl. Pak. 20).

3900-4500 m / alp.-subniv.: moist, turf / W Himalaya: Swat – Kashmir, S Karakorum / W HIM / he.

Vicatia conifolia DC. (*V. millefolia* C. B. Clarke)

CHILAS: Babusar Village, 3960 m, *M. A. Siddiqi & Y. Nasir 2822* (RAW, Fl. Pak. 20). — ASTOR: (Cat. Pak.). — ASTOR/DEOSAI: Burzil Chowki, 3350 m, *R. R. Stewart 19885* (RAW, Fl. Pak. 20); Burzil P., *R. R. Stewart 22089* (K, RAW, Fl. Pak. 20).

3350-3960 m / mont.-alp. / Himalaya: E Afgh. – Bhutan / HIMAL / he.

Records may (in part?) refer to *V. wolffiana*.

Vicatia wolffiana (Wolff ex Fedde) Norman (*Pimpinella saxifraga* var. *dissectifolia* C. B. Clarke, *Tongoloa wolffiana* Wolff ex Fedde)

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12910* (!). – Go: Gor, Martal, 2970 m, *Nüsser 1133* (B!). – Ra: Kosto Valley, 4300 m, *Nüsser 1423* (B!); Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser 1440* (B!); Raikot Gl., nunatak, BC, 3990 m, *Nüsser 457* (B!); 3990 m, *Nüsser 464* (B!); 4000 m, *Troll 7764*; Raikot Valley, 3230 m, *Schickhoff 1605* (!); 3560 m, *Schickhoff 1646* (!). — ASTOR: *R. R. Stewart 22901* (Cat. Pak.). – Da: Harchu Valley, Baro Nirril, 3200 m, *Troll 7287*. – As: Rama, *R. R. Stewart & E. Nasir 22901* (K, RAW, Fl. Pak. 20); *E. Nasir & Webster 6433* (GH, RAW, Fl. Pak. 20); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1032* (!); 3220 m, *Schickhoff 965* (!); 3380 m, *Schickhoff 987* (!). – Ru: Chichi Valley, 3200 m, *Troll 7485*. — ASTOR/KASHMIR: Kamri, *Duthie 12544* (K, Fl. Pak. 20); Kamri etc. (Cat. Pak.). — ASTOR/DEOSAI: Burzil (Cat. Pak.).

2970-4300 m / mont.-alp.: dwarf scrub, forest, rock, scree, scrub, turf (*Abies*, *Betula*, *Pinus wallichiana*) / W Himalaya: N Pakistan, NW India / W HIM / he.

Urticaceae***Debregeasia salicifolia*** (D. Don) Rendle (*Boehmeria salicifolia* D. Don, *Debregeasia hypoleuca* Wedd., *Urtica salicifolia* (D. Don) Roxb.)

CHILAS: Go: Darang >, 1450 m, *Dickoré 12692* (!). — ASTOR: Da: Harchu, 2000 m, *Troll 7919* (cf., ? “*Urticaceae* semi-scrub”).

1450-2000 m / coll.-submont.: moist, scrub / Africa, S Asia (Afgh., Pakistan, India) / SUBTROP / ch.

Urtica dioica L. / gomee, jomi (sh), Common Nettle (e)

CHILAS: Go: Gor, 2940 m (*Dickoré*). – Ra: Raikot Valley, 3230 m, *Schickhoff 1625* (!). — ASTOR: (Cat. Pak.). – Da: Doian, 2600 m (*Dickoré*); Mushkin Forest, RH – Dashkin, 2660 m, *Nüsser 273* (B!); Mushkin RH > SE, 2750 m, *Dickoré 12784* (!). – As: Chillam, 2890-3040 m, *R. R. & I. D. Stewart 18965* (RAW, Fl. Pak. 137).
2600-3230 m / submont.-mont.: forb, forest, rock, ruderal (*Cedrus*, *Pinus wallichiana*) / temp. regions of both hemispheres / COSMO / he.

Valerianaceae

Valeriana clarkei Briq. (*V. elegans* C. B. Clarke)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1761* (!, cf.). – Go: Gor, 2690 m, *Schickhoff 1575* (!); Gor, Martal <, 2650 m, *Nüsser 1176* (B!). – Pa: Pattaro Valley, Zangal, 2600 m, *Troll 7689*. — ASTOR: As: Gudai, *R. R. Stewart* (Cat. Pak.); Gurikot – Kirim, *R. R. Stewart 21975* (RAW, Fl. Pak. 27).
2600-2750 m / submont.-mont.: forest, steppe-forest (*Cedrus*, *Pinus gerardiana*) / SW Karakorum, Gilgit, Astor, Baltistan / ENDEM / he.

Valeriana hardwickii Wall.

CHILAS: Bu: Buldar Valley, Fary, 2790 m, *Nüsser 1033* (B!, cf.). — ASTOR: Da: Mushkin Forest, *Duthie 12266* (“var. *hoffmeisteri*”, Cat. Pak.).
2790 m / mont. / Himalaya: Swat – Nepal, SE Asia / HIMAL / he.

Valeriana himalayana Grubov (*V. pusilla* Royle, *V. dioica* sensu C. B. Clarke, non L.)

CHILAS: Go: Gor, 3520 m, *Schickhoff 1494* (!); Gor Gali, 2500-2800 m, *Troll 7109* (“*V. dioica*”). – Ra: Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser 1435* (B!); Raikot Valley, Bezar, 3700 m, *Troll 7645* (“*V. dioica*”). – Bu: Buldar Valley, Mamocha Peak <, 4250 m, *Troll 7846* (“*V. dioica*”). — ASTOR: As: Rama Valley, 3800 m, *Nüsser 169* (B!). — Astor/Skardu: Alampi P., 3960 m, *Duthie 12173* (K, Fl. Pak. 27).
2500-4250 m / submont.-alp.: alluvial fan, scrub / Karakorum, Himalaya: Chitral – Garhwal / W HIM / he.

Valeriana jaeschkei C. B. Clarke (*V. dubia* C. B. Clarke, *V. kaschmiriensis* Grubov, *V. officinalis* auct., non L.)

CHILAS: Go: Gor, 3230 m, *Schickhoff 1544* (!); Gor > NW, 2770 m, *Dickoré 12588* (!). — ASTOR: Da: Doian, 2400-2800 m, *Troll 7212*. – As: Gudai, *Duthie 12223* (“*V. dubia*”, Cat. Pak.). – Ru: Zaipur >, 3120 m, *Schickhoff 1065* (!). – Ka: Kalapani Valley, 3400 m, *Troll 8036* (“*V. officinalis*”). — ASTOR/DEOSAI: Burzil P., 4260 m, *R. R. Stewart 19907* (RAW, Fl. Pak. 27).
2400-4260 m / submont.-alp.: forest, steppe-forest (*Abies*, *Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / W Himalaya: Gilgit – Lahul / W HIM / he.

Valeriana jatamansi Jones (*V. wallichii* DC.) / mukshbala, pishwala (u)

ASTOR: As: Gudai (Kazmi & Siddiqui 1953); Rama Forest (Kazmi & Siddiqui 1953); Rama Valley, Sachen Gl. <, 3220 m, *Schickhoff* (!). – Ru: Chichi Valley, 3200 m, *Troll 7490*;

Zaipur >, 3140 m, *Schickhoff 1103* (!, cf.). – Ka: Faqirkot, 3220 m, *Schickhoff 1356* (!); Kalapani, 3040 m, *M. B. Zaman* (PPFI-B, Fl. Pak. 101); Kalapani Valley, 3300 m, *Troll 8019*; Kalapani, Rattak, 3800 m, *Hansen 84* (!).

3040-3800 m / mont.-subalp.: forest (*Abies*, *Pinus wallichiana*) / Himalaya: Afgh. – W China / HIMAL / ge.
Medicinal.

Valerianella szowitziana Fisch. & C. A. Mey. (*V. aucheri* Boiss., *V. persica* Boiss.)

CHILAS: Go: Gor, Terimal, 2400 m, *Troll 7130*.

2400 m / submont. / SW & Asia: Turkey – W Himalaya / IRAN / th.

Violaceae

Viola biflora L. / Yellow Violet (e)

CHILAS: Go: Gor, 3520 m, *Schickhoff 1501* (!); Gor, Kahlmimay <, 3540 m, *Nüsser 1119* (B!); Gor, Martal, 2970 m, *Nüsser 1129* (B!). — ASTOR: Da: Mushkin RH > SE, 2700 m, *Dickoré 12769* (!). – As: Rama, 3040 m, *E. Nasir & Webster 6434* (RAW, Fl. Pak. 166); 3040 m, *E. Nasir & Webster 6455* (RAW, Fl. Pak. 166); Rama Valley, 3780 m, *Nüsser 165* (B!); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1035* (!). – Ru: Tarishing, 2700-3000 m, *Troll 7385*; Tarishing – Bayals, 2950 m, *Nüsser 787* (B!). – Ka: Kalapani, *Giles 125* (Cat. Pak.). 2700-3780 m / mont.-subalp.: alluvial fan, forest, irrigated meadow, scrub, steppe-forest (*Abies*, *Juniperus excelsa*) / Europe, Asia, N America / CIRC POL / he.

Viola kunawurensis Royle

CHILAS: Babusar P., 4300 m, *Miehe 568* (!); 4320 m, *Miehe 549* (!); Babusar P. NE, 4210 m, *Dickoré 12897* (!).

4210-4320 m / alp.: dwarf scrub, rock, scree, turf / Karakorum, Himalaya: Afgh. – SE Tibet, W China / HIMAL / he.

Viola rupestris F. W. Schmidt (*V. arenaria* DC.) / lilio (sh) / Teesdale Violet (e)

CHILAS: Babusar Valley, 3200 m, *Schickhoff 1696* (!). – Pa: Diamir Valley, 3150 m, *Schickhoff 2446* (!). – Ra: Fairy Meadows, 3390 m, *Nüsser 949* (B!); Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser 1431* (B!); Raikot Gl. – Ganalo Gl. confluence, 3890 m, *Nüsser 293* (B!); Raikot Gl., nunatak, BC, 4000 m, *Troll 7749* (“var. *arenaria*”); Raikot Valley, 3220 m, *Schickhoff 1659* (!); 3230 m, *Schickhoff 1613* (!); Raikot Valley, Jut, 3310 m, *Nüsser 941* (B!); Raikot Valley, Pungadori, 3300 m, *Nüsser 919* (B!). — ASTOR: Da: Doian, 2900 m, *Troll 7206a*; Mushkin Forest, 2900 m, *Schickhoff 1410* (!); 3000 m, *Schickhoff 1426* (!); Mushkin RH <, 2580 m, *Dickoré 12728* (!); Mushkin RH > SE, 2700 m, *Dickoré 12766* (!); 2750 m, *Dickoré 12781* (!). – As: Chongra, 3000 m, *Hansen 205* (!); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1022* (!); 3220 m, *Schickhoff 970* (!); 3380 m, *Schickhoff 984* (!). – Ru: Zaipur >, 3120 m, *Schickhoff 1051* (!); 3140 m, *Schickhoff 1095* (!). – Ka: Faqirkot, 2980 m, *Schickhoff 1315* (!); 3220 m, *Schickhoff 1345* (!). — ASTOR/DEOSAI: Burzil P. (Cat. Pak.).

2580-4210 m / submont.-alp.: forest, moist (*Abies*, *Betula*, *Cedrus*, *Picea*, *Pinus wallichiana*, *Salix wallichiana*) / Europe, Asia S to W Himalaya / EURAS / he.

Vitaceae

● *Vitis vinifera* L. / jach (sh), Grape-vine (e)

CHILAS: Chilas – Babusar, 1330 m (*Dickoré*). – Go: Gor, 2160 m (*Dickoré*). — ASTOR: (Cat. Pak.). – Da: Dashkin, 1780 m (*Dickoré*).

1330-2160 m / coll.-submont. / cultivated (origin probably SE Europe, SW Asia) / np.
Cultivated mainly for raisins.

Zygophyllaceae

Fagonia bruguieri DC. (*F. cretica* var. *bruguieri* (DC.) T. Anders., *F. echinella* Boiss.)

CHILAS: Go: Bunji – Thelichi, 1300 m, *Troll* 7085.

1300 m / coll.: desert / Africa, SW Asia / SUBTROP / he.

Peganum harmala L. / harmal, isband, isband (u)

CHILAS: Ra: Indus Valley, Shangri La, 1190 m, *Nüsser* 570 (B!); Jalipur, 1200 m, *Troll* 7174. – Bu: Muthat – Raikot Bridge, 2280 m, *Nüsser* 1054 (B!). — ASTOR: Da: Bunji, 1300 m, *Troll* 7089.

1190-2280 m / coll.-submont.: desert / N Africa, S Europe, SW & C. Asia, Himalaya, S Tibet / MEDIT / he.

Medicinal.

Tribulus terrestris L. / gokhru, tirkundi (u)

CHILAS: Babusar Valley, 1350 m, *Schickhoff* 1726 (!); Chilas nr., *Peer* 4 (!). – Go: Gor, 2400 m, (*Dickoré*); Thelichi, 1260 m, *Dickoré* 12510 (!). – Bu: Indus Valley, Shangri La, 1280 m, *Nüsser* 1217 (B!). — ASTOR: (Cat. Pak.). – Da: Ramghat Pul, 1200 m, *Troll* 7075.

1200-2400 m / coll.: ruderal, semi-desert, steppe (*Artemisia fragrans*) / Africa, S Europe, S Asia, N Australia (introduced N & S America) / MEDIT / th.

Medicinal.

Monocotyledoneae

Alliaceae

Allium atosanguineum Schrenk

CHILAS: Pa: Pattaro Valley, 4200 m, *Troll* 7723. – Bu: Buldar Valley, 3800 m, *Troll* 7603. — ASTOR: 3960 m, *Tanner* 171 (K!). — Astor/Skardu: Alampi P. [P. to Harpo in Rongdo], *Winterbottom* 789 (K!); Alampi P. W, 4270 m, *Duthie* 12178 (BM!, K!).

3800-4270 m / subalp.-alp.: turf / Tian Shan, Pamir, W Himalaya: Chitral, Astor / PAMIR / ge.
SE limit of distribution, an apparently disjunct outpost.

Allium carolinianum DC. (*A. thomsonii* Baker)

ASTOR: As: Burzil P. N, 3440 m (Persson 1938); Rama Valley, 3660 m, *Lankester & Pearson*

(BM!). – Ka: Kalapani, 3200 m, *Giles 182* (K!). — ASTOR/KASHMIR: Kamri P., 4000 m, *Troll 8053*. — ASTOR/DEOSAI: Burzil Chowki, *R. R. Stewart 19118* (KUH, Fl. Pak. 83). 3200-4000 m / mont.-alp.: scree, turf / Tian Shan, Pamir, Karakorum, W Himalaya: Afgh. – Nepal, ?Tibet / PAMIR / ge.

Allium consanguineum Kunth (*A. stracheyi* Baker)

ASTOR: As: Burzil P. N (Persson 1938).

NE Hindukush, SW Karakorum, W Himalaya: Swat, Gilgit, Hazara – W Nepal / W HIM / ge.

Allium fedtschenkoanum Regel (*A. semenovii* auct., non Regel) / palon (sh)

ASTOR: Ka: Guryas P. N, 3660 m, 1847-06-21, *Winterbottom 509* (K!); Kalapani, 3200-3660 m, *Giles 183* (K!); 3700 m, *Hansen 31* (!); Kalapani – Kamri P., 3300-4000 m, *Troll 8055* (“*A. semenovii*”); Steanmarg, *M. B. Zaman s.n.* (PPFI-M, Fl. Pak. 83).

3200-4000 m / mont.-alp.: dwarf scrub, moist, turf / Tian Shan, Pamir, W Himalaya: E Afgh. – Garhwal / PAMIR / ge.

Allium humile Kunth (*A. govanianum* Wall. ex Baker)

ASTOR: Ka: Steanmarg, *M. B. Zaman* (PPFI-M, Fl. Pak. 83).

Himalaya: Chitral – Assam, Burma / HIMAL / ge.

Allium jacquemontii Kunth (*A. rubellum* auct., non M. Bieb.)

CHILAS: Bu: Muthat – Raikot Bridge, 2480 m, *Nüsser 1043* (B!). — ASTOR: Ru: Tap Gl. right lateral moraine, 3590 m, *Nüsser 737* (B!, cf.). – Ka: Rattu, *R. R. Stewart 18796* (RAW, Fl. Pak. 83); 2800 m, *Troll 7978* (“*A. rubellum*”).

2480-3590 m / submont.-subalp.: dwarf scrub, scree (*Artemisia santolinifolia*) / W Pamir, Himalaya: E Afgh. – NW India / W HIM / ge.

Allium platyspathum Schrenk

CHILAS: Ra: Raikot Gl., nunatak, BC, 3910 m, *Nüsser 1288* (B!).

3910 m / alp. / Altai, Tian Shan, Pamir, W Himalaya: Chitral, Gilgit / PAMIR / ge.

● ***Allium ramosum*** L.

ASTOR: Da: Mangdoian, 1700 m (*Dickoré*).

1700 m / ge.

Cultivated as a vegetable.

Allium roylei Stearn

ASTOR: As: Gurikot [W Gorrakoa, Godi in Hasora], *Winterbottom 727* (K, Fl. Pak. 83).

W Himalaya: E Afgh. – Kashmir / W HIM / ge.

Allium schoenoprasum L.

ASTOR: Ru: Latobo, Tap Gl. left lateral moraine, 3710 m, *Nüsser 42* (B!); Shaigiri – Latobo, 3600 m, *Nüsser 1573* (B!).

3600-3710 m / subalp. / Europe, Asia, N America / CIRCPOLE / ge.

Apparently an isolated outpost on the S edge of its distribution in Astor and Kashmir.

***Allium victorialis* L. / gurhan (sh)**

ASTOR: Ka: Kalapani, *M.B.Zaman* 1975 (PPFI-M, Fl. Pak. 83); 3400 m, *Hansen* 100 (!).
3400 m / subalp. / Europe, Asia (S to W Himalaya), N America / CIRC POL / ge.
Edible; apparently rare in NW Himalaya.

[*Allium winterbottomii* Wang & Tang]

ASTOR: Ka: Gurys P. N [P to Gurais], *Winterbottom* 527 (K!).
Of unknown identity.

Asparagaceae***Asparagus neglectus* Kar. & Kir.**

CHILAS: Pa: Pattaro Valley, Zangal, 2650 m, *Troll* 7693.
2650 m / submont.: forest (*Pinus wallichiana*) / C. Asia, Afgh., NW Himalaya / C AS / ge.
As “*Asparagus filicinus* [Buch.-Ham. ex D. Don] proper sensu Hook. f.”, but probably referring to *A. neglectus*, which also occurs in Gilgit.

Asphodelaceae***Eremurus himalaicus* Baker / shilo shah (sh)**

ASTOR: Ru: Chichi Valley, 3200 m, *Troll* 7480. – Ka: Faqirkot, 2800 m, *Hansen* 224 (!);
Gurys P. N [P to Gurais], 3660 m, *Winterbottom* 513 (K!).
2800-3660 m / mont.-subalp.: dwarf scrub, scree, scrub (*Artemisia santolinifolia*) / W
Himalaya: NE Afgh. (Nuristan), ?Gilgit, Astor – Lahul, Punjab / W HIM / ge.

Colchicaceae***Colchicum luteum* Baker / surinjan talakh (u)**

CHILAS: Ra: Jut, 3330 m, *Nüsser* 933 (B!, cf.); Raikot Valley, right slope above Fary,
3300 m, *Nüsser* 1025 (B!). — ASTOR: Da: Doian, 2800-3000 m, *Troll* 7204; Harchu Valley,
left slope above Baro Nirril, 3160 m, *Nüsser* 857 (B!); Lathang >, 3480 m, *Nüsser* 862 (B!).
– As: Rama Forest (“*Merendera persica*”, Kazmi & Siddiqui 1953).
2800-3480 m / mont.-subalp.: avalanche path, dwarf scrub, moist, steppe (*Artemisia
brevifolia*) / Tian Shan, Pamir-Alai, E Afgh., W Himalaya (Nuristan – Kashmir) / PAMIR / ge.
Medicinal, poisonous.

Convallariaceae***Polygonatum geminiflorum* Decne.**

CHILAS: Ra: Raikot Valley, 3220 m, *Schickhoff* 1662 (!); 3230 m (*Schickhoff* 1629). – Bu:
Buldar Valley, 3300 m, *Troll* 7600; Lichar Valley, 3200 m, *Troll* 7585. — ASTOR: Da: Mush-
kin RH > SE, 2750 m, *Dickoré* 12782 (!); 2800 m, *Dickoré* 12798 (!). – As: Rama Valley,
Sachen Gl. <, 3080 m, *Schickhoff* 1023 (!); 3220 m, *Schickhoff* 964 (!). – Ru: Tarishing,
2800-3000 m, *Troll* 7395; Zaipur >, 3120 m, *Schickhoff* 1046 (!); 3140 m, *Schickhoff* 1098 (!).

– Ka: Faqirkot, 3220 m, *Schickhoff 1352* (!); Kalapani, 3260 m, *Schickhoff 1235* (!).
2750-3300 m / mont.: forest, moist (*Abies*, *Picea*, *Pinus wallichiana*) / W Himalaya:
Kurrum, Chitral – Kashmir, Himachal Pr., ?Kumaon / W HIM / ge.

Polygonatum leptophyllum (D. Don) Royle (*P. verticillatum* auct., non (L.) All., *P. cirrhifolium* auct., non (Wall.) Royle)

CHILAS: Pa: Diamir Valley, 3150 m, *Schickhoff 2458* (!). — ASTOR: Da: Mushkin, 2300-2500 m, *Troll 7265* (“*Polygonatum cirrhifolium*”).

2300-3150 m / submont.-mont.: forest, irrigation (*Pinus wallichiana*, *Populus*, *Salix*) / SW Karakorum, W Himalaya (Kashmir – Nepal, Bhutan) / W HIM / ge.

Cyperaceae

Blysmus compressus (L.) Panzer ex Link / Flat-sedge (e)

CHILAS: Go: Gor > NW, 2600 m, *Dickoré 12547* (!); Martal, 2970 m, *Nüsser 1145* (B!). – Ra: Lake Pungadori, 3300 m, *Nüsser 345* (B!). — ASTOR: As: Das Kirim Valley, Chilim, 3250 m, *Miehe 950901* (!); Gudai – Chillam, Burzil P., 2900 m, *R. R. Stewart 18975* (K!); Gurikot, 2500 m, *Troll 7550*. – Ru: Rattu – Rupal, 2440-2740 m, *R. R. Stewart 22820b* (K!); Shaigiri, 3750 m, *Nüsser 1567* (B!). – Ka: Kalapani, 3010 m, *Schickhoff 1288* (!); 3010 m, *Schickhoff 1294* (!); Rattu, 2700 m, *Troll 7960*.

2440-3750 m / submont.-subalp.: fen, flush, irrigation, meadow (*Pinus gerardiana*, *Quercus*) / temp. Europe, Asia, N Africa / EURAS / ge.

Carex canescens L. (*C. curta* Good.) / White Sedge (e)

ASTOR: As: Rama 3050-3350 m, *R. R. Stewart 22895*; *R. R. Stewart 22896* (K!). – Ka: Kamri P. N, 3660 m, *R. R. Stewart 22703* (K!). — ASTOR/DEOSAI: Burzil P. 3200 m, *C. B. Clarke 29630* (K!).

3050-3660 m / subalp. / Europe, Asia, N America / CIRC POL / he.

Apparently rare and disjunct in the Inner W Himalaya (Astor, Deosai, Hazara, Kashmir, Lahul).

Carex cruenta Nees

CHILAS: Pa: Pattaro Valley, Guttum Sagar – Kosto Gali, 4830 m, *Nüsser 1407* (B!). – Ra: Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser 1433* (B!); Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser 1328* (B!). — ASTOR: As: Das Kirim – Sardar Kothi, 2740-3050 m, *R. R. Stewart 22003* (K!). – Ru: Toshain Valley, ascent to Mazeno Gali moraine, 5010 m, *Nüsser 1518* (B!). – Ka: Kalapani, 3200 m, *Giles 121* (K, Clarke 1898); Kalapani Valley, 3300 m, *Troll 8022*.

2740-5010 m / mont.-subniv.: flush, meadow, moist, scree, scrub, turf / Himalaya: Chitral – SE Tibet / HIMAL / he.

Carex duthiei C. B. Clarke (*C. atrata* var. *pullata* Boott, *C. nigerrima* Nelves)

ASTOR: Da: Mushkin RH – Turbaling, 2620 m, *Dickoré 12750* (!); Mushkin RH > SE,

2720 m, *Dickoré 12775* (!); 2770 m, *Dickoré 12796* (!). — ASTOR/DEOSAI: Burzil P. 3440 m, *C. B. Clarke 29722* (K! type of *C. nigerrima*).

2620-3440 m / mont.-subalp.: forest, moist, tall forb (*Pinus wallichiana*, *Salix wallichiana*) / W Himalaya – SE Tibet, W China, SE Asia / HIMAL / he.

***Carex infusata* Nees**

CHILAS: Ra: Tato – Fairy Meadows, 3060 m, *Nüsser 980* (B!). – Bu: Fary, Buldar Valley, 2860 m, *Nüsser 1029* (B!). — ASTOR: As: Das Kirim Valley, Chilim, 3250 m, *Miehe 950803* (!); Gurikot, 2500 m, *Troll 7347* (“*C. alpina*”); Teing [Ting], *Strachey & Winterbottom 755* (K, Clarke 1898). – Ka: Faqirkot, 2800 m, *Schickhoff 1374* (!).

2500-3250 m / submont.-mont.: irrigation, riverside, turf / Pamir-Alai, Hindukush, W Himalaya (Afgh. – Nepal) / W HIM / he.

***Carex melanantha* C. A. Mey.**

CHILAS: Babusar P. N, 3700 m, *Dickoré 12859* (!); Babusar P. NE, 4210 m, *Dickoré 12880* (!). – Pa: Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser 1365* (B!); 4490 m, *Nüsser 1384* (B!); Pattaro Valley, Gutum Sagar >, 4450 m, *Nüsser 1337* (B!). – Ra: Raikot Valley, 3900-4000 m, *Troll 7624*; Raikot Valley, Nunatak, 3800 m, *Troll 7794*. — ASTOR: As: Das Kirim – Sardar Kothi, Burzil P. N, 3660 m, *R. R. Stewart 22003b* (K!). – Ru: Chichi Valley, 3200 m, *Troll 7494*.

3200-4490 m / mont.-alp.: avalanche path, dwarf scrub, rock, scree, turf / W Mongolia, Altai, Tian Shan, Pamir-Alai, Kashgaria, Hindukush, Karakorum, W Himalaya (E Afgh. – Nepal) / C AS / he.

Troll 7794 is listed as *C. capillaris* var. *ledebouriana* in Troll’s manuscript, which may refer to *C. melanantha*, or to *C. karoï*, a species occurring in Karakorum, Baltistan and Dras/Suru.

***Carex microglochin* Wahlenb. / Bristle Sedge (e)**

CHILAS: Ra: Raikot Gl., nunatak, BC, 4000 m, *Troll 7764a*.

4000 m / alp.: fen, flush / Europe, Asia, N & S America / CIRCPOL / he.

***Carex nivalis* Boott**

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12900* (!). – Pa: Pattaro Valley, 4400 m, *Troll 7732*; Pattaro Valley, Guttum Sagar – Kosto Gali, 4830 m, *Nüsser 1404* (B!). – Ra: Kosto Valley, 4300 m, *Nüsser 1422* (B!); Raikot Gl., 3700 m, *Troll 7621* (“*f. luteobrunnea*”); Raikot Gl., nunatak, 4180-4550 m, *Nüsser 378* (B!); 4180-4550 m, *Nüsser 400* (B!); 4180-4550 m, *Nüsser 377* (B!). — ASTOR: As: Rama Valley, 3660 m, *Lanckester & Pearson 1413* (BM!). – Ru: Lolio Duru, 3700 m, *Troll 7430*; Mazeno High Camp, ascent, 4600-4700 m, *Nüsser 1503* (B!); 4700 m, *Nüsser 1510* (B!); Rupal Gl. ablation valley, 3950 m, *Nüsser 1559* (B!); Shaigiri, 3750 m, *Nüsser 1569* (B!); Tap – Latobo, 3500-3600 m, *Troll 7422*; Toshain Valley, ascent to Mazeno Gali moraine, 5010 m, *Nüsser 1519* (B!). — ASTOR/KASHMIR: Kamri P., Gilgit Rd., *R. R. Stewart 18861* (K!).

3500-5010 m / subalp.-subniv.: dwarf scrub, moraine, rock, scree, turf / Tian Shan, Pamir-Alai, Kashgaria, Hindukush, Karakorum, W Tibet, W Himalaya: Afgh. – Kumaon, Nepal / PAMIR / he.

***Carex orbicularis* Boott**

ASTOR: As: Descent from Deotso [Deosai] to Das Kirim, *Winterbottom 511 (807) (K!)*; Rama Valley, 3510 m, *Lankester & Pearson 1493 (BM!)*; Suti Suce – Das Kurrum [Das Kirim, below Burzil P.], 1847-07-01, *Strachey & Winterbottom 675 (K!)*; 1847-07-01, *Strachey & Winterbottom 662 (K!)*. – Ru: Lower Rupal Valley, Gageh, 3080 m, *Nüsser 767 (B!)*; Tarishing, 2910 m, *Nüsser 749 (B!)*; upper Rupal Valley, 3500 m, *Troll 7419*; 3500 m, *Troll 7461*. – Ka: Faqirkot, 2800 m, *Schickhoff 1372 (!)*; Kalapani, 3010 m, *Schickhoff 1293 (!)*; 3010 m, *Schickhoff 1295 (!)*.

2800-3510 m / mont.-subalp.: fen, riverside / C. Asia, Siberia, Mongolia, Altai, Tian Shan, Pamir-Alai, Hindukush, Karakorum, Kashmir, Himalaya (Afgh. – Nepal), Tibet, Qinghai (“subsp. *orbicularis*”). / C AS / ge.

***Carex pamirensis* C. B. Clarke**

ASTOR: As: Rama, 3050 m, *E. Nasir & Webster 6441 (K!)*.

3050 m / mont.: lake / Dzungaria, C. Tian Shan, E Pamir-Alai, Hindukush, S Karakorum, Himalaya: Afgh. (Nuristan) – Bhutan / PAMIR / he.

***Carex parva* Nees**

CHILAS: Ra: Raikot Valley, Nunatak, 3750 m, *Troll 7762*; 3800 m, *Troll 7795*. — ASTOR: Ru: Tarishing, 2900 m, *Troll 7390*; upper Rupal Valley, 3500 m, *Troll 7459a*.

2900-3800 m / mont.-subalp.: moist, fen, turf (*Rhododendron*, *Salix karelinii*) / Mongolia, Dzungaria, Tian Shan, Pamir-Alai, Afgh. (Bamian: Koh-i-Baba), Kashgaria, Karakorum, S Tibet, Himalaya, China / C AS / he.

***Carex plectobasis* V. Krecz. (*C. hirtella* sensu Drejer, non J. F. Gmel.)**

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12874 (!)*. – Pa: Pattaro Valley, Gutum Sagar >, 4450 m, *Nüsser 1340 (B!)*. – Ra: Raikot Valley, Pungadori – Bezar, 3500 m, *Troll 7653*.

3500-4450 m / subalp.-alp.: dwarf scrub, rock, scree, turf / S Karakorum, W Himalaya: E Afgh. (Nuristan) – Nepal / W HIM / he.

***Carex pseudobicolor* Boeck.**

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12876 (!)*. – Pa: Pattaro Valley, 3950 m, *Nüsser 1355 (B!)*.

3950-4210 m / alp.: dwarf scrub, rock, scree, turf / ?Hindukush, W Himalaya (Swat – Nepal, Sikkim) / W HIM / he.

***Carex pseudofetida* Kük.**

ASTOR: As: Rama Valley, 3180 m, *Nüsser 897 (B!)*. – Ru: Latobo Plain, upper Rupal Valley, 3540 m, *Nüsser 726 (B!)*; lower Rupal Valley, Tarishing, 2910 m, *Nüsser 781 (B!)*; upper Rupal Valley, 3500 m, *Troll 7459*.

2910-3540 m / mont.-subalp.: fen, turf / Altai, Tian Shan, Pamir-Alai, Kashgaria, Kunlun, Hindukush, Karakorum, W Tibet, Himalaya (Afgh. – Bhutan) / C AS / he.

***Carex songorica* Kar. & Kir.**

ASTOR: Ka: Kalapani, 3010 m, *Schickhoff 1287 (!)*.

3010 m / mont.: fen, flush / Caucasus – Siberia, Mongolia; Tian Shan, Pamir, Afgh., S Karakorum, SW Ladakh, Kashmir / IRAN / he.

Carex stenocarpa Turcz. ex V. Krecz.

CHILAS: Babusar P., 4000-4200 m, *Miehe* 580 (!); 4300 m, *Miehe* 483 (!); 4320 m, *Miehe* 543 (!); Babusar P. NE, 4210 m, *Dickoré* 12918 (!); 4210 m, *Dickoré* 12873 (!, cf.). – Pa: Bunar Valley, Loiba 3900 m, *Peer* (!); Pattaro Valley, Guttum Sagar, 4490 m, *Nüsser* 1377 (B!); *Nüsser* 1390 (B!). – Ra: Ganalo Gl., nunatak, BC, 4200 m, *Nüsser* 515 (B!, cf.); Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser* 1437 (B!); 4210 m, *Nüsser* 1438 (B!); Kosto Valley, Jiliper High Camp > Ridge, 4200 m, *Nüsser* 1319 (B!); Kosto Valley, right ridge, 4310 m, *Nüsser* 1314 (B!); Raikot Gl., nunatak, BC, 3970-4400 m, *Nüsser* 458 (B!); *Nüsser* 463 (B!, cf.); *Nüsser* 467 (B!); Raikot Valley, 4000 m, *Troll* 7625; Raikot Valley, Jut, 3330 m, *Nüsser* 932 (B!). — ASTOR: As: Waylari, *Winterbottom* 771 (K!). – Ru: Mazeno High Camp, ascent, 4600 m, *Nüsser* 1499 (B!); Rupal Ridge, 3400 m, *Troll* 7476.

3330-4600 m / mont.-subniv.: dwarf scrub, forest, rock, scree, turf (*Betula*, *Carex stenocarpa*, *Kobresia capillifolia*) / Siberia, Mongolia, Turkestan, Dzungaria, Tian Shan, Pamir-Alai, Kashgaria, W Kunlun, NE Afgh. (Wakhan), Karakorum, W Himalaya (Hazara – W Nepal) / C AS / he.

A very characteristic and common species of alpine scree and turf (*Troll* 7476 is listed as *C. cf. pediformis* in *Troll's* manuscript, a species which apparently is not known from Himalaya).

Carex stenophylla Wahlenb.

CHILAS: Go: Gor, 2500 m, *Troll* 7160. — ASTOR: Da: Doian, 2800-3000 m, *Troll* 7225. – As: Das Kirim Valley, Chilim, 3250 m, *Miehe* 950805 (!); Gurikot, 2500 m, *Troll* 7336; Gurikot E, 2600 m, *Troll* 7361.

2500-3250 m / submont.-mont.: steppe (*Artemisia brevifolia*) / Europe: Spain and N Italy (very local), E Europe, SW, C. & E Asia / EURAS / he.

Troll 7160 is listed as *Kobresia macrantha* in *Troll's* manuscript, a species which is superficially similar, but apparently not known from W of Ladakh.

[*Carex supina* Wahlenb.]

CHILAS: Ra: Raikot Valley, Pungadori – Bezar, 3400 m, *Troll* 7652 (“var. *costata*”).

3400 m / subalp. / Europe, Asia.

Of uncertain identity, *Carex supina* (s.str.) occurs in Tian Shan and disjunctively from C. Himalaya through SE Tibet, no W Himalayan specimens have been seen.

Cyperus squarrosus L.

CHILAS: Go: Gor > NW, 2600 m, *Dickoré* 12553 (!).

2600 m / submont.: flush, steppe-forest (*Pinus gerardiana*, *Quercus*) / trop. & S Africa; trop. & subtrop. Asia: NE Afgh., Himalaya – S China; Australia; N & S America (S Canada – Chile) / SUBTROP / th.

Eleocharis palustris (L.) Roem. & Schult. / Common Spike-rush (e)

ASTOR: As: Gurikot, 2400 m, *Troll* 7551. – Ru: Rehmanpur, 2600 m, *Troll* 7384.

2400-2600 m / submont.: fen, irrigation / Europe, Asia, N America / CIRC POL / ge.
Possible, but specimens may also belong to *E. uniglumis*.

Eleocharis quinqueflora (Hartmann) O. Schwartz / kilimumur (sh), Few-flowered Spike-rush (e)

CHILAS: Go: Gor, 2500 m, *Troll 7161*. — ASTOR: As: Das Kirim Valley, Chilim, 3250 m, *Miehe 950902* (!). — Ka: Kalapani, 3010 m, *Schickhoff 1291* (!); 3010-3050 m, *Schickhoff 1296a* (!).

2500-3250 m / submont.-mont.: fen, flush, irrigation / temp. Europe, Asia, N Africa, N America, S America (Chile) / CIRC POL / he.

Eleocharis uniglumis (Link) Schult. & Schult. f. / Slender Spike-rush (e)

ASTOR: As: Rama, 3050 m, *R. R. Stewart 22943b* (K!).

3050 m / mont. / Europe, Asia (S to Caucasus, Afgh., W Himalaya) / EURAS / ge.

Eriophorum scheuchzeri Hoppe / Scheuchzer's Cotton-grass (e)

CHILAS: Ra: Raikot Valley, Nunatak, 3750 m, *Troll 7761*.

3750 m / subalp.: fen, moist, sand (*Rhododendron*, *Salix karelinii*) / Europe, Asia (rare in W Himalaya), N America / CIRC POL / he.

Very rare in the W Himalaya (Hazara: Kaghan, Chilas, Kashmir).

Erioscirpus comosus (Wall.) Palla (*Eriophorum comosum* Wall.)

CHILAS: Ra: Darang – Jalipur, 1200 m, *Troll 7168*.

1200 m / coll.: rock, moist, semidesert / SE Iran, Afgh., Himalaya: Pakistan – Myanmar, China, N Vietnam / HIMAL / he.

Common along the lower Indus Valley.

Fimbristylis bisumbellata (Forssk.) Bubani

CHILAS: Go: Darang >, 1450 m, *Dickoré 12703* (!).

1450 m / coll.: flush, meadow / Canaries, Africa, warm-temp. Europe, Asia (E to Turkmenia, W Himalaya), Malesia, Australia / SUBTROP / th.

Fimbristylis sieberiana Kunth

CHILAS: Go: Thelichi, 1260 m, *Dickoré 12513* (!).

1260 m / coll.: moist, semi-desert / SW Asia (Cyprus – W Himalaya), Africa, Malesia, N Australia / SUBTROP / th.

Isolepis setacea (L.) R. Br. / Bristle Club-rush (e)

ASTOR: As: Das via Goltere or Naugaum to Hasora or Astor, 1856-09-08/20, *Schlagintweit 6414* (BM!, Clarke 1898).

Fen, flush / temp. Europe, Asia (E to W Siberia, China, S to Himalaya), N Africa; Australia / EURAS / th.

Kobresia capillifolia (Decne.) C. B. Clarke / mairmude (sh)

CHILAS: Babusar P., 4320 m, *Miehe 542* (!). — Go: Gor, 3520 m, *Schickhoff 1485* (!). — Pa:

Pattaro Valley, Guttum Sagar, 4260 m, *Nüsser 1358* (B!). – Ra: Bezar Gali S, Fulu, 4180 m, *Nüsser 543* (B!); Fairy Meadows > right slope, 3660 m, *Nüsser 991* (B!); Ganalo Gl., nunatak, BC, 4200 m, *Nüsser 510* (B!); Kosto Valley, 4300 m, *Nüsser 1425* (B!); Kosto Valley, Jiliper High Camp, 4210 m, *Nüsser 1439* (B!); Raikot Gl., nunatak, 3950-4120 m, *Nüsser 445* (B!); *Nüsser 371* (B!); *Nüsser 374* (B!); Raikot Gl., nunatak, BC, 3970-4400 m, *Nüsser 525* (B!); *Nüsser 496* (B!); *Nüsser 476* (B!); *Nüsser 447* (B!); *Nüsser 485* (B!). — ASTOR: Da: Rama Ridge N, 3500-3900 m, *Troll 7300*. – As: Bulan Ridge, 4180 m, *Nüsser 178* (B!, cf.); Rama Valley, 3660 m, *Lankester & Pearson 1503* (BM!); Rama Valley, left slope, 3620 m, *Nüsser 205* (B!). – Ru: Latobo S, 3950 m, *Nüsser 68* (B!); Rupal Valley, Nagachakali, nunatak, 3440-3870 m, *Nüsser 598* (B!); *Nüsser 626* (B!); *Nüsser 612* (B!); *Nüsser 619* (B!); upper Mazeno Base Camp, 4320 m, *Nüsser 1479* (B!); upper Rupal Valley, 3800-4000 m, *Troll 7433*.

3440-4400 m / subalp.-alp.: dwarf scrub, forest, scree, scrub, turf (*Betula*, *Kobresia capillifolia*, *Rhododendron*, *Salix karelinii*) / ?Caucasus; Pamir-Alai, Tian Shan, ?Altai, ?E Siberia; Karakorum, W Kunlun, W Himalaya: E Afgh. (Kurrum, Nuristan) – Nepal, ? W, S & E Tibet (Qinghai, Xizang), ? W China (Gansu, Sichuan) / C AS / he.

[*Kobresia caricina* Willd.]

CHILAS: Ra: Raikot Valley, Nunatak, 3800 m, *Troll 7793*. — ASTOR: Da: Doian – Muthat, 3400 m, *Troll 7616*.

This circumpolar species does not occur in the Himalaya; records may refer to *K. royleana* or *K. karakorumensis*.

***Kobresia karakorumensis* Dickoré**

CHILAS: Babusar P. N, 3700 m, *Dickoré 12856* (!); Babusar P. NE, 4210 m, *Dickoré 12879* (!). – Go: Kahlmay >, 3770 m, *Nüsser 1111* (B!). — ASTOR: Ru: upper Rupal Valley, upper Mazeno Base Camp, 4320 m, *Nüsser 1481* (B!).

3700-4320 m / subalp.-alp.: avalanche path, dwarf scrub, rock, scree, turf / ?E Pamir, Kongur, Wakhan, Chitral, Karakorum, inner W Himalaya, Karakorum, NW Himalaya (Ladakh – W Nepal) / W HIM / he.

***Kobresia laxa* Nees / toko kadj (sh)**

CHILAS: Go: Gor, 2500 m, *Troll 7160a*; 2940 m (*Dickoré*); Gor > NW, 2770 m, *Dickoré 12596* (!); Gor, Terimal, 2400 m, *Troll 7128*; Martal, 2970 m, *Nüsser 1146* (B!). – Bu: Muthat, 2960 m, *Nüsser 1034* (B!). — ASTOR: As: Chongra, 2500 m, *Troll 7313*; Rama Valley, 2740 m, *Lankester & Pearson 1437* (BM!). – Ru: Tarishing, 2700-2900 m, *Troll 7393*; 2910 m, *Nüsser 573* (B!). – Ka: Kalapani, 3200 m, 1885, *Giles 19* (K!).

2400-3200 m / submont.-mont.: flush, irrigation, meadow, moist, turf / ?W Pamir; W Himalaya: Afgh. (Nuristan) – Sikkim / W HIM / ge.

***Kobresia nitens* C. B. Clarke**

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12914* (!). – Pa: Pattaro Valley, Guttum Sagar, moraine, 4490 m, *Nüsser 1388* (B!). – Ra: Raikot Gl., nunatak, 4270 m, *Nüsser 391* (B!); Raikot Gl., nunatak, BC, 4300-4430 m, *Nüsser 505* (B!); 4300-4430 m, *Nüsser 484* (B!); Raikot Valley, Kilo Sagar, 4300 m, *Troll 7792*. — ASTOR: Da: Rama Ridge N, 3600 m, *Troll*

7301. – As: Rama Ridge, 4000 m, *Nüsser 212* (B!, cf.). – Ru: Mazeno Gl., 4300 m, *Peer* (!). 3600-4490 m / subalp.-alp.: dwarf scrub, rock, scree, turf (*Kobresia capillifolia*, *Rhododendron*) / ?Wakhan, S Karakorum, W Himalaya (Hazara – W Nepal) / W HIM / he.

Kobresia royleana (Nees) Boeck.

ASTOR: Ru: Upper Rupal Valley, 3500 m, *Troll 7460*.

3500 m / subalp. / Dzung. Alatau, Tian Shan, Pamir-Alai, Kunlun, Karakorum, Afgh., Himalaya, Tibet (Qinghai, Xizang; W, N, C., NE, S, SE), Sichuan / C AS / he.

Kobresia schoenoides (C. A. Mey.) Steud.

CHILAS: Babusar P., 4050-4100 m, *Miehe 463* (!); 4300 m, *Miehe 482* (!). – Go: Kahlmay >, 3870 m, *Nüsser 1100* (B!). – Ra: Raikot Gl., nunatak, BC, 4030 m, *Nüsser 518* (B!). — ASTOR: As: Rama Valley, 3660 m, *Lankester & Pearson* (BM!). – Ru: Upper Mazeno Base Camp, 4320 m, *Nüsser 1480* (B!); upper Rupal Valley, 3800-4000 m, *Troll 7431*.

3660-4320 m / subalp.-alp.: dwarf scrub, fen, flush, meadow, turf / Caucasus, Armenia, Afgh., Pamir-Alai, Tian Shan, ?Altai, ?Siberia; Karakorum, Kashmir, Himalaya, Tibet, W China (Gansu, Qinghai, Xizang, Sichuan) / C AS / he.

Characteristic large tufts, locally dominant.

Pycnus flavescens (L.) Reichenb.

CHILAS: Go: Gor > NW, 2600 m, *Dickoré 12555* (!); 2600 m, *Dickoré 12559* (!).

2600 m / submont.: flush, rock, steppe-forest (*Pinus gerardiana*, *Quercus*) / Almost worldwide / COSMO / th.

Apparently rare in the W Himalaya.

Pycnus flavidus (Retz.) Koyama (*Cyperus flavidus* Retz.)

CHILAS: Go: Darang >, 1450 m, *Dickoré 12702* (!); Gor > NW, 2600 m, *Dickoré 12552* (!); Thelichi, 1260 m, *Dickoré 12527* (!).

1260-2600 m / coll.-submont.: moist, semi-desert, wet places by spring, steppe-forest (*Pinus gerardiana*, *Quercus*) / warm-temp. Europe, Asia, Africa, Australia / SUBTROP / th.

Pycnus sanguinolentus (Vahl) Nees

CHILAS: Go: Darang >, 1450 m, *Dickoré 12701* (!); Gor > NW, 2600 m, *Dickoré 12554* (!).

1450-2600 m / coll.-submont.: moist, steppe-forest (*Pinus gerardiana*, *Quercus*) / Africa, warm-temp. Asia, Oceania / SUBTROP / th.

Trichophorum pumilum (Vahl) Schinz & Thell.

ASTOR: As: Gurikot, 2500 m, *Troll 7346*. – Ru: Upper Rupal Valley, 3500 m, *Troll 7462* (“*Scirpus alpinus*”).

2500-3500 m / submont.-subalp.: fen, flush / circumarctic: Europe, Asia (S to Caucasus, Iran, Afgh., Karakorum, Kashmir, S Tibet); N America (E) / CIRCPOLE / he.

Gramineae

Agrostis gigantea Roth / Black Bent (e)

ASTOR: Ru: Tarishing, 2910 m, *Nüsser 578* (B!); Tarishing – Churit, 2830 m, *Nüsser 143* (B!). – Ka: Rattu, 2800 m, *Miehe 950401* (!).

2800-2910 m / mont. / temp. Europe, Asia S to N Pakistan: Punjab, Gilgit; Kashmir – Himachal Pr.; introduced in N America, New Zealand / EURAS / he.

Agrostis hissarica Roshev. (*A. stewartii* Bor)

ASTOR: As: Rama 3050 m, *R. R. & I. D. Stewart* 22929 (K, Fl. Pak. 143).

3050 m / mont. / Tian Shan, Pamir, Afgh. – NW Pakistan / PAMIR / he.

Specimen not seen.

Agrostis munroana Aitch. & Hemsley

CHILAS: Babusar P. N, 3520-3570 m, *Dickoré* 12838 (!). — ASTOR: As: Das Kirim Valley, Chilim, 3250 m, *Miehe* 950807 (!).

3250-3570 m / subalp.: dwarf scrub (*Bistorta affinis*, *Juniperus communis*) / W Himalaya: Kurram, Dir, Swat, Hazara, Kashmir – Nepal / W HIM / he.

Agrostis munroana Aitch. & Hemsley × *pilosula* Trin.

ASTOR: As: Gudai Valley, 3350-3660 m, *Duthie* 12218 (K!).

3350-3660 m / mont.-subalp.

Agrostis pilosula Trin.

ASTOR: As: Sangu Sar [Sango Sar], on the right side of the Tsinger Gl. [Sachen Gl.], 1856-09-12, *Schlagintweit* 6570 (BM!).

Himalaya: Swat – SE Tibet, N & S India / HIMAL / he.

Agrostis vinealis Schreb. / Brown Bent (e)

CHILAS: Babusar Valley, 3200 m, *Schickhoff* 1693 (!). – Go: Gor, 3520 m, *Schickhoff* 1500 (!); Gor > NW, 2770 m, *Dickoré* 12601 (!); 2950 m, *Dickoré* 12643 (!). – Ra: Bezar Gali E, Sagar, 3750 m, *Nüsser* 532 (B!, cf.); Lake Pungadori, 3300 m, *Nüsser* 346 (B!); Raikot Valley, 3220 m, *Schickhoff* 1671 (!); Raikot Valley, Jut, 3310 m, *Nüsser* 939 (B!). — ASTOR: Da: Mushkin Forest, 2900 m, *Schickhoff* 1394 (!); 3000 m, *Schickhoff* 1427 (!); Mushkin RH > SE, 2700 m, *Dickoré* 12763 (!), 12789 (!). – As: Rama Valley, 3180 m, *Nüsser* 892 (B!); Rama Valley, left slope, 3620 m, *Nüsser* 204 (B!, cf.); Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff* 1017 (!), 1033 (!); 3380 m, *Schickhoff* 998 (!); Rama Valley, SW of Astor, 3200 m, *T. E. Lankester* 1488 (BM!). – Ru: Middle Rupal Valley, village Lower Rupal, 3100 m, *Nüsser* 1585 (B!); Nagachakali, “nunatak”, 3500-3620 m, *Nüsser* 607 (B!); 606 (B!); Rupal Valley, Bayals, 3160 m, *Nüsser* 591 (B!); Rupal Valley, Nagachakali, nunatak, 3500-3620 m, *Nüsser* 636 (B!); Tarishing, 2910 m, *Nüsser* 579 (B!); Zaipur >, 3120 m, *Schickhoff* 1063 (!), 1057 (!); 3140 m, *Schickhoff* 1109 (!), 1094 (!). – Ka: Faqirkot, 2980 m, *Schickhoff* 1304 (!); 3220 m, *Schickhoff* 1360 (!); Kalapani, 3050 m, *Schickhoff* 1270 (!), 1276 (!); Kalapani Valley, 3400 m, *Troll* 8040.

2700-3750 m / mont.-subalp.: dwarf scrub, forest, scrub, steppe-forest (*Abies*, *Artemisia santolinifolia*, *Betula*, *Cedrus*, *Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / N Africa, temp. Europe, Asia S to Pakistan: Punjab, Gilgit; Kashmir; N America (NE), Greenland / CIRC POL / he.

Alopecurus aequalis Sobol. / Orange Foxtail (e)

ASTOR: As: Rama, 3050 m, *E. Nasir & Webster 6443* (RAW, Fl. Pak. 143). – Ka: Rattu, 2700 m, *Troll 7959*.

2700-3050 m / mont.: flush / Europe, Asia, N America / CIRCOPOL / he.

Alopecurus arundinaceus Poir.

CHILAS: Ra: Raikot Gl., nunatak, BC, 3950 m, *Troll 7628*. – Bu: Lichar Valley, Darsh Sagar, 3400 m, *Troll 7615*. — ASTOR: Ru: Rupal Gl. ablation valley, 3950 m, *Nüsser 1555* (B!). – Ka: Kalapani Valley, 3300 m, *Troll 8023*.

3300-3950 m / mont.-alp. / temp. Europe, Asia, S to Caucasus, N Pakistan (Baluch., Chitral, Hazara, Gilgit), Kashmir, W Himalaya; introduced in N America / EURAS / he.

Alopecurus himalaicus Hook. f.

ASTOR/DEOSAI: Stakpi P., ascent to Deosai, *Winterbottom 646* (K!).

SE Europe (Bulgaria) – C. Iran, Pamir-Alai, SW Karakorum, W Himalaya (Nuristan – Kashmir) / IRAN / he.

Aristida adscensionis L.

CHILAS: Go: Gor, 2420 m, *Dickoré 12668* (!); Gor > NW, 2600 m, *Dickoré 12562* (!); Thelichi, 1260 m, *Dickoré 12524* (!).

1260-2600 m / coll.-submont.: scrub, semi-desert, wet places by spring, steppe-forest (*Pinus gerardiana*, *Quercus*) / S Europe, SW, C. & SE Asia, N & trop. Africa, N, C. & S America / SUBTROP / th.

Aristida cyanantha (Nees) Steud.

CHILAS: Go: Gor 2400 m (*Dickoré*).

2400 m / submont. / W Himalaya: E Afgh., N Pakistan, Kashmir, NW India, Nepal / W HIM / ch. Common along the lower Indus Valley, also in Gilgit and Hunza.

Avena fatua L. / shashir (sh), Wild-oat (e)

ASTOR: Ka: Faqirkot, 2700 m, *Hansen 189* (!).

2700 m / mont. / temp. Europe, Asia, N Africa; introduced in N & S America / EURAS / th.

Bothriochloa ischaemum (L.) Keng

CHILAS: Go: Gor, 2420 m, *Dickoré 12669* (!); 2940 m (*Dickoré*). – Ra: Tato, 2400 m, *Troll 7831*. — ASTOR: Da: Doian, 1450-1930 m (*Dickoré*). – As: Rama – Gurikot, 2440 m, *R. R. Stewart 22947a* (K!). – Ka: Rattu, 2800 m, *Miehe 950501* (!).

1450-2940 m / coll.-mont.: scrub (*Quercus*) / temp. Europe, Asia: S Europe – C. Asia (N to W Siberia, SW Altai), China, Korea; Himalaya, S Tibet; N Africa / EURAS / he.

Briza media L. / Quaking-grass (e)

ASTOR: Ka: Kalapani, 3050-3350 m, *Duthie 12655* (K!); Kalapani Valley, 3400 m, *Troll 8039*. — ASTOR/DEOSAI: Burzil, 3350 m, *C. B. Clarke 29713* (K!).

3050-3400 m / mont.-subalp. / Europe, Asia (S to Himalaya: Kashmir – Bhutan) / EURAS / he.

Bromus confinis Nees ex Steud. / shisho katsh (sh)

CHILAS: Babusar Valley, 3200 m, *Schickhoff 1695* (!). – Pa: Diamir Valley, 3150 m, *Schickhoff 2443* (!); Jiliper Valley, 3000 m, *Troll 7687*. – Ra: Fairy Meadows, 3300 m, *Troll 7639*; Raikot Valley, 3220 m, *Schickhoff 1668* (!); Raikot Valley, Pungadori – Bezar, 3400 m, *Troll 7656*; Tato – Fairy Meadows, 3100 m, *Troll 7809*. – Bu: Lichar Valley, 3100 m, *Troll 7580*; Muthat, Chwar, 3000 m, *Troll 7836*. — ASTOR: Da: Dashkin, 2500 m, *Troll 7895*; Mushkin Forest, 2900 m, *Schickhoff 1398* (!), *1402* (!, cf.); 3000 m, *Schickhoff 1424* (!). – As: Dumusar Valley, 3200 m, *Troll 7532*. – Ru: Zaipur >, 3120 m, *Schickhoff 1064* (!), *1068* (!); 3140 m, *Schickhoff 1102* (!). – Ka: Faqirkot, 2800 m, *Hansen 39e* (!); 2980 m, *Schickhoff 1306* (!); 3220 m, *Schickhoff 1348* (!); Kalapani, 3200 m, *Giles s.n.* (K!); Kalapani Valley, 3300 m, *Troll 8035*; Shankargarh, 2930 m, *Giles s.n.* (K!). 2500-3400 m / submont.-subalp.: forest (*Abies*, *Picea*, *Pinus wallichiana*) / N & C. Iran; SW Karakorum, W Himalaya (Kurram, Swat – Nepal) / W HIM / he.

[*Bromus inermis* Leysser]

ASTOR: As: Gudai Valley, 3350-3660 m, *Duthie 12210* (K, Fl. Pak. 143). – Ka: Shankargarh 3350 m, *R. R. Stewart 22753* (K, Fl. Pak. 143). 3350-3660 m / subalp. / Europe, Asia / EURAS / he. Records may refer to *B. confinis*.

Bromus japonicus Thunb. ex Murray / Thunberg's Brome (e)

ASTOR: Da: Doian <, 1680 m, *Nüsser 717* (B!); Mushkin Forest, RH – Dashkin, 2660 m, *Nüsser 269* (B!, cf.). – As: Gurikot, 2440 m, *R. R. Stewart 22958* (K!). 1680-2660 m / coll.-submont. / Europe, Asia: C. Europe – Japan, S to Afgh., Pakistan (Baluch.), Kashmir; widely introduced in Europe, N America and elsewhere / EURAS / th.

Bromus oxyodon Schrenk

ASTOR: Ru: Chugam, *Giles 70* (K!); Rupal – Gurikot, 2440 m, *R. R. Stewart 22862* (K!); Rupal Valley, 2590 m, *R. R. & I. D. Stewart 18902* (RAW, Fl. Pak. 143). – Ka: Kalapani – Shankargarh, 3350 m, *R. R. Stewart 22743* (K!). 2440-3350 m / submont.-mont. / Tian Shan, Pamir, W Himalaya / PAMIR / th.

Bromus pectinatus Thunb.

CHILAS: Go: Gor, 2420 m, *Dickoré 12648* (!); Martal <, 2680 m, *Nüsser 1168* (B!); Ranote, 2120 m, *Nüsser 1186* (B!). – Ra: Raikot Valley, village Fary, 2680 m, *Nüsser 1014* (B!); Tato – Fairy Meadows, 2480 m, *Nüsser 961* (B!). — ASTOR: As: Rama, 3050 m, *R. R. Stewart 22926a* (K!). – Ru: Chugam, 2530 m, *Giles 35* (K!); lower Rupal Valley, Churit – Bulashbar, 2480 m, *Nüsser 807* (B!). 2120-3050 m / submont.-mont.: ruderal, scrub (*Quercus*) / Europe, S & E Africa, Arabia – Pakistan (Baluch., Punjab, NWFP, Gilgit; more widespread than *B. japonicus*), Kashmir – India – Nepal, China / EURAS / th.

Bromus tectorum L. / jungeli shisher (sh), Drooping Brome (e)

CHILAS: Go: Gor > NW, 2600 m, *Dickoré 12579* (!). — ASTOR: As: Los, 2400 m, *Troll 7327*. – Ru: Chugam, 2530 m, *Giles 102* (K!). – Ka: Faqirkot, 2800 m, *Hansen 133* (!); Rattu >, 2740 m, *R. R. Stewart 22801* (K!).

2400-2800 m / submont.-mont.: steppe-forest (*Pinus gerardiana*, *Quercus*) / Macaronesia, N Africa, Europe, Medit. – C. Asia, Siberia, China; SW Asia – Himalaya, SE Tibet / EURAS / th.

***Calamagrostis decora* Hook. f.**

ASTOR: Da: Doian >, 3350-3660 m, *Duthie 12454* (K!, type of *Deyeuxia kashmiriana*); Mushkin Forest, 2740-3050 m, 1892-09-27, *Duthie 12660* (K!, type of *C. decora*); Mushkin RH > SE, 2750 m, *Dickoré 12788* (!); 2800 m, *Dickoré 12804* (!).

2740-3660 m / mont.-subalp.: forest (*Abies*, *Pinus wallichiana*) / Gilgit (Rakaposhi, Nanga Parbat), Baltistan, Kashmir / ENDEM / he.

***Calamagrostis epigejos* (L.) Roth / Wood Small-reed (e)**

ASTOR: Da: Dashkin, 2500 m, *Troll 7893*. – As: Das Kirim – Sardar Kothi, Burzil P. N, 3350 m, *R. R. Stewart 22030* (K!).

2500-3350 m / submont.-mont. / Europe, Asia / EURAS / ge.

***Calamagrostis pseudophragmites* (Hall. f.) Koeler / shisho katsh (sh)**

CHILAS: Bu: Muthat, 2900 m, *Troll 7597*. — ASTOR: *R. R. & I. D. Stewart 18890* (KUH, RAW, Fl. Pak. 143); 1680-3350 m (Fl. Karak.1). – Da: Doian <, 1680 m, *Nüsser 722* (B!); Mushkin Forest, 2580 m, *Schickhoff 1120* (!); Mushkin RH <, 2580 m, *Dickoré 12710* (!); Mushkin RH > SE, 2700 m, *Dickoré 12762* (!); Ramghat, 1300 m, *Troll 7913* (“var. *dubia*”). – Ru: Rupal Valley, 2740 m, *R. R. Stewart 22824* (K, Fl. Karak.1). – Ka: Faqirkot, 2800 m, *Hansen 39b* (!).

1300-3350 m / coll.-mont.: forest, moist (*Cedrus*, *Pinus wallichiana*, *Salix wallichiana*) / temp. Europe, Asia / EURAS / he.

***Calamagrostis stoliczkae* Hook. f.**

CHILAS: Ra: Raikot Gl. – Ganalo Gl. confluence, 3900 m, *Nüsser 284* (B!); Raikot Gl., left lateral moraine, 3880 m, *Nüsser 430* (B!); 3880 m, *Nüsser 431* (B!). — ASTOR: Ru: Rupal Gl. ablation valley, 3950 m, *Nüsser 1556* (B!).

3880-3950 m / subalp.-alp. / Gilgit, Indus Valley, Karakorum, Ladak, Zanskar, ?Kashmir / ENDEM / he.

***Chrysopogon gryllus* subsp. *echinulatus* (Nees) T. A. Cope**

ASTOR: Da: Dashkin, 2500 m, *Troll 7894*. – As: Astor Bazar, 2400 m, *Troll 7937*; Gurikot, 2380 m, *Giles 56* (K!); 2400 m, *Troll 7546*.

2380-2500 m / submont. / NE Afgh., Pakistan (NWFP, Punjab), Kashmir, NW India – C. Nepal / W HIM / he.

***Colpodium himalaicum* (Hook. f.) Bor (*C. trollii* Pilger)**

CHILAS: Babusar P., 4300 m, *Miehe 528* (!); Babusar P. NE, 4210 m, *Dickoré 12919* (!). – Pa: Pattaro Valley, 4400-4800 m, *Troll 7728*; Pattaro Valley, Guttum Sagar – Kosto Gali, 4860 m, *Nüsser 1409* (B!). — ASTOR: Ru: Sharsingi Ridge, 4200 m, *Troll 7507* (B destroyed, type of *C. trollii*).

4200-4860 m / alp.-subniv.: dwarf scrub, rock, scree, turf / SW Karakorum, W Himalaya: Hazara, Kashmir – Kumaon, C. Nepal / W HIM / he.
NW limit of distribution (outpost in SW Karakorum).

Colpodium nutans (Stapf) Bor (*Catabrosa nutans* Stapf, *Hyalopoa nutans* (Stapf) Alexeev ex T. A. Cope)

ASTOR: As: Rama Valley, 3660 m, *Lankester & Pearson 1409* (BM!). – Ka: Kalapani, 3350-3660 m, *Duthie 12547* (W!). — ASTOR/KASHMIR: Kamri P., 3350-3660 m, *Duthie 12642* (W!).

3350-3660 m / mont.-subalp.: meadow, turf / W Himalaya: Astor – Kashmir / ENDEM / he.
NW limit of distribution.

Cymbopogon jwarancusa (Jones) Schult.

ASTOR: Da: Bunji, 1300 m, *Troll 7086*; Ramghat, 1200-1900 m, *Troll 7910*; 1450 m (*Dickoré*).

1200-1900 m / coll. / Pakistan (Sind, Baluch., Punjab, NWFP, Gilgit), Kashmir, India (mainly W), Nepal / W HIM / he.

subsp. *olivieri* (Boiss.) Soenarko

CHILAS: Go: Gor, 2420 m, *Dickoré 12670* (!).

2420 m / submont.: scrub (*Quercus*) / Sokotra, Iraq – Pakistan (Sind, Baluch., Punjab, NWFP, Gilgit), NW India, Nepal / IRAN / he.

Cymbopogon pospischilii (K. Schum.) C. E. Hubbard

CHILAS: Go: Gor, 1850 m, *Schickhoff 1458* (!); Ranote <, Haparing, 1950 m, *Nüsser 1205* (B!); Thelichi, 1260 m, *Dickoré 12519* (!). – Ra: Tato – Raikot Bridge, 2330 m, *Nüsser 561* (B!). – Bu: Muthat – Raikot Bridge, 1950 m, *Nüsser 1065* (B!). — ASTOR: Da: Doian, 2130 m, *Giles 545* (K!); lower Astor, 1830 m, *Duthie 12301* (K, KUH!).

1260-2330 m / coll.-submont.: semi-desert, steppe (*Artemisia fragrans*) / E Africa (Cape – Ethiopia, Somalia); Pakistan (Sind, Punjab, NWFP, Gilgit), Kashmir, NW Himalaya – Nepal / SUBTROP / he.

Cynodon dactylon (L.) Pers. / Bermuda-grass (e)

CHILAS: Bu: Karakorum Highway, Shangri La, Indus Valley, 1280 m, *Nüsser 1216* (B!). — ASTOR: Da: Ramghat, 1200-1800 m, *Troll 7067*.

1200-1800 m / coll. / trop. – warm temp. world-wide / SUBTROP / ge.

Dactylis glomerata subsp. *himalayensis* Domin / shisho katsh (sh), Cock's-foot (e)

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12621* (!). – Ra: Raikot Valley, Bayal, 3160 m, *Nüsser 590* (B!). — ASTOR: Ru: Tarishing – Churit, 2830 m, *Nüsser 141* (B!). – Ka: Faqirkot, 2800 m, *Hansen 39a* (!); Kalapani Valley, 3300 m, *Troll 8031*.

2800-3300 m / mont.: forest, hay-meadow (*Picea*, *Pinus wallichiana*) / Himalaya (*D. glomerata* subsp. *glomerata*: Europe, Asia) / HIMAL / he.

Deschampsia cespitosa subsp. *pamirica* / Tufted Hair-grass (e)

ASTOR: Ru: Upper Rupal Valley, 3500 m, *Troll 7457*. — ASTOR/DEOSAI: Burzil Chowki,

Gilgit Road, 3350 m, *R. R. & I. D. Stewart 19749* (RAW, “*D. cespitosa*”, Fl. Pak. 143). 3350-3500 m / mont.-subalp. / Tian Shan, Pamir-Alai, Wakhan, Karakorum, W Himalaya / PAMIR / he.

Digitaria sanguinalis (L.) Scop. / Hairy Finger-grass (e)

ASTOR: Da: Ramghat Camping Ground, 1680 m, *Duthie 12300* (K, Fl. Pak. 143). 1680 m / coll. / warm temp. (-trop.) regions / COSMO / th.

Echinochloa crus-galli (L.) P. Beauv. / Cockspur Grass (e)

CHILAS: Go: Gor, 2000 m (*Dickoré*). 2000 m / submont.: ruderal / temp. – subtrop. (-trop.) regions / COSMO / th.

Elymus canaliculatus (Nevski) Tzvelev (*E. longearistatus* subsp. *canaliculatus* (Nevski) Tzvelev)

CHILAS: Go: Gor, 3230 m, *Schickhoff 1555* (!); 3230 m, *Schickhoff 1543* (!). – Ra: Raikot Gl., left lateral moraine, 3880 m, *Nüsser 429* (B!); Raikot Gl., nunatak, BC, 4000 m, *Troll 7771*. 3230-4000 m / mont.-alp.: forest (*Picea*, *Pinus wallichiana*) / Pamir-Alai, S Karakorum – Himalaya (Chitral, Kashmir – Nepal) / W HIM / he.

Elymus cognatus (Hackel) T. A. Cope

CHILAS: Pa: Diamir Valley, 2970 m, *Schickhoff 2418* (!). — ASTOR: Da: Mushkin Forest, 2580 m, *Schickhoff 1141* (!), *1147* (!, cf.); 2740-3050 m, *Duthie 12276* (K!); 2900 m, *Schickhoff 1386* (!); 3000 m, *Schickhoff 1422* (!). – Ru: Chugam, 2530 m, *Giles s.n.* (K!). – Ka: Rattu >, 2740 m, *R. R. Stewart 21791a* (K!); Shankargarh >, 3350 m, *R. R. Stewart 22751* (K!). 2530-3350 m / submont.-mont.: forest (*Pinus wallichiana*) / Iran, Afgh., Pakistan (Chitral, Gilgit, Baltistan; Ladakh) / IRAN / he.

Elymus dahuricus Turcz. ex Griseb.

CHILAS: Bu: Muthat, Chwar, 3000 m, *Troll 7844*. — ASTOR: As: Rama – Gurikot, 2440-2740 m, *R. R. Stewart 22948a* (K!). 2440-3000 m / submont.-mont. / Siberia, Mongolia – C. Asia; Afgh., N Pakistan, Kashmir, Himalaya, S & E Tibet, China, Japan. / C AS / ge.

Elymus dentatus (Hook. f.) Tzvelev

CHILAS: Ra: Raikot Gl., nunatak, 3880-4000 m, *Nüsser 411* (B!); 3880-4000 m, *Nüsser 432* (B!). 3880-4000 m / subalp.-alp. / S Siberia, Altai, W C. Asia to Pamir Alai, W Kunlun, Karakorum, N Pakistan, Kashmir / C AS / he.

Elymus fedtschenkoi Tzvelev

CHILAS: Ra: Raikot Gl., nunatak, BC, 4030 m, *Nüsser 520* (B!); Raikot Valley, Nunatak, 3800 m, *Troll 7778* (cf., “*Roegneria*”). — ASTOR: Da: Doian >, 3050-3350 m, *Duthie 12657* (K!); Mushkin RH > SE, 2800 m, *Dickoré 12805* (!). – Ka: Kalapani P., 3660 m, 1952-08-12, *M. A. Siddiqi s.n.* (K!).

2800-4030 m / mont.-alp.: forest (*Abies*, *Pinus wallichiana*) / C. Asia – W Siberia; N Pakistan (Swat, Gilgit, Astor), Ladakh / PAMIR / he.

Elymus nutans Griseb.

ASTOR: As: Burzil P. N, 3660 m, *R. R. Stewart* 22032 (K!); descent from Deotso [Deosai] to Das Kirim, 1847-07-25, *Winterbottom* 703 (K!). – Ru: Rupal – Gurikot, 2440 m, *R. R. Stewart* 22863a (K!); Rupal Valley, Bayals, 3160 m, *Nüsser* 589 (B!).

2440-3660 m / submont.-subalp. / C. Asia, Pakistan (Chitral, Gilgit, Karakorum; Kashmir), Himalaya / C AS / he.

Elymus repens (L.) Gould / Common Couch (e)

CHILAS: Babusar Valley, 2750 m, *Schickhoff* 1751 (!), 1741 (!).

2750 m / mont.: forest (*Cedrus*) / temp. Europe, Asia (Pakistan: Baluch., Chitral, Baltistan; Ladakh); introduced into many temperate countries / EURAS / ge.

Elymus schrenkianus (Fisch. & C. A. Mey.) Tzvelev

CHILAS: Babusar P. NE, 4210 m, *Dickoré* 12903 (!).

4210 m / alp.: dwarf scrub, rock, scree, turf / C. Asia, Karakorum, Pakistan (Gilgit, Hazara), Kashmir, Himalaya / C AS / he.

Elymus schugnanicus (Nevski) Tzvelev

CHILAS: Pa: Pattaro Valley, Gutum Sagar >, 4450 m, *Nüsser* 1346 (B!).

4450 m / alp. / C. Asia, Pakistan (Chitral, Gilgit, Karakorum) / PAMIR / he.

Elymus semicostatus (Nees ex Steud.) Melderis, Stearn & Williams

CHILAS: Go: Gor, 2690 m, *Schickhoff* 1590 (!); Gor > NW, 2600 m, *Dickoré* 12580 (!); 2600 m, *Dickoré* 12569 (!). — ASTOR: As: Astor – Rama, 2440-2740 m, *R. R. Stewart* 22882 (K!); Gudai Valley, 3350-3660 m, *Duthie* 12186 (BM!); Rama – Gurikot, 2440-2740 m, *R. R. Stewart* 22948 (K!).

2440-3660 m / submont.-subalp.: steppe-forest (*Pinus gerardiana*, *Quercus*) / Afgh., Pakistan (Kurram, Chitral, Hazara, Gilgit), Kashmir, Himalaya – Sikkim / W HIM / he.

[*Elymus sibiricus* L.]

ASTOR: Ka: Kalapani – Kamri P., 3700 m, *Troll* 8067; Rattu, 2700 m, *Troll* 7949.

The records may refer to *E. nutans* or *E. schrenkianus*.

Enneapoçon persicus Boiss.

CHILAS: Chilas, 1000 m, *Miehe* 950105 (!). – Go: Darang >, 1550 m, *Dickoré* 12679 (!); Gor, 1400-1600 m (*Dickoré*); Ranote <, Haparing, 1950 m, *Nüsser* 1204 (B!); Thelichi, 1260 m, *Dickoré* 12518 (!). – Bu: Indus Valley, Astor Valley – Raikot Bridge, 1470 m, *Nüsser* 907 (B!); Indus Valley, terrace, KKH – Old Bunji Bridge, 1380 m, *Nüsser* 706 (B!). — ASTOR: Da: Ramghat, 1200-1800 m, *Troll* 7074; 1400 m, *Troll* 7194; 1400 m (*Dickoré*).

1000-1950 m / coll.: semi-desert (*Heliotropium dasycarpum*, *Stipagrostis plumosa*) / SE Spain (very disjunct & local); NE Africa, SW & C. Asia: Egypt, Arabia – Turkmenistan, India / MEDIT / he.

Eragrostis minor Host / Small Love-grass (e)

CHILAS: Go: Gor > NW, 2600 m, *Dickoré 12558* (!); Thelichi, 1260 m, *Dickoré 12512* (!). — ASTOR/DEOSAI: Deosai ascent, *Winterbottom 862* (K!).

1260-2600 m / coll.-submont.: semi-desert, wet places by spring, steppe-forest (*Pinus gerardiana*, *Quercus*) / N, W & C. Europe, Medit., SW, C. & E Asia, trop. Africa; introduced in Australia and America / EURAS / th.

Eragrostis pilosa (L.) P. Beauv. / Indian Love-grass (e)

CHILAS: Go: Gor > NW, 2600 m, *Dickoré 12551* (!); 2600 m, *Dickoré 12557* (!).

2600 m / submont.: steppe-forest (*Pinus gerardiana*, *Quercus*) / C. & S Europe, SW, C., E and trop. Asia; introduced in S Africa and America / EURAS / th.

Eremopoa altaica subsp. *songarica* (Schrenk) Tzvelev

CHILAS: Go: Gor, 2500-3000 m, *Troll 7143*. — ASTOR: As: Gudai Valley, 3350-3660 m, *Duthie 12663* (K, RAW!).

2500-3660 m / submont.-subalp. / Turkey, Caucasus – Afgh. (Nuristan), N Pakistan, Kashmir, Himalaya – W China; S Ural – Altai / C AS / th.

Festuca alaica Drobov

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1758* (!). – Ra: Bezar Gali S, Fulu, 4180 m, *Nüsser 541* (B!); Raikot Gl., left lateral moraine, 3900 m, *Nüsser 418b* (B!). — ASTOR: Ru: Mazeno High Camp, ascent, 4600 m, *Nüsser 1497* (B!).

2750-4600 m / mont.-subniv.: forest (*Cedrus*) / Turkey, N Iran, Pamir-Alai, Tian Shan, Afgh., W Himalaya (N Pakistan, Kashmir, NW India). / IRAN / he.

Festuca alata (St.-Yves) Roshev.

CHILAS: Pa: Pattaro Valley, 4200 m, *Troll 7733*. – Bu: Buldar Valley, Mamocha Peak <, 4200 m, *Troll 7864*. — ASTOR: As: Rama Valley, SW of Astor, 3660 m, *Lankester & Pearson 1471* (BM!).

3660-4200 m / subalp.-alp. / Dzung. Alatau, Tian Shan, Alai, Kongur; S & W Karakorum, NW Himalaya (disjunct) / PAMIR / he.

Festuca coelestis (St.-Yves) V. Krecz. & Bobrov

CHILAS: Babusar P., 4050-4100 m, *Miehe 462* (!); Babusar P. NE, 4210 m, *Dickoré 12930* (!); 4210 m, *Dickoré 12884* (!). – Ra: Ganalo Gl., nunatak, BC, 4200 m, *Nüsser 509* (B!); Raikot Gl., nunatak, BC, 3970 m, *Nüsser 475* (B!). — ASTOR: Ka: Kamri Valley, 1892-08-25, *Duthie s.n.* (W, Fl. Karak.1).

3970-4210 m / alp.: dwarf scrub, rock, scree, turf / Dzung. Alatau, Tian Shan, Pamir-Alai, W Kunlun, W & S Karakorum, W Himalaya (Kurram – Kashmir) / PAMIR / he.

Festuca gigantea (L.) Vill. / Giant Fescue (e)

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12630* (!).

2950 m / mont.: forest (*Picea*, *Pinus wallichiana*) / Europe, Asia; introduced N America / EURAS / he.

Festuca hartmannii (Markgr.-Dannenb.) Alexeev

CHILAS: Babusar P., 4300 m, *Miehe 511* (!); *Miehe 569* (!); Babusar P. N, 3520-3570 m, *Dickoré 12841* (!); Babusar P. NE, 4210 m, *Dickoré 12929* (!). – Go: Gor, 3520 m, *Schickhoff 1495* (!). – Ra: Raikot Gl. left moraine, 3820 m, *Nüsser 1310* (B!); Raikot Valley, 3560 m, *Schickhoff 1644* (!). — ASTOR: As: Rama Valley, Sachen Gl. <, 3380 m, *Schickhoff 1000* (!). – Ru: Zaipur >, 3120 m, *Schickhoff 1077* (!); 3140 m, *Schickhoff 1093* (!). – Ka: Kalapani, *Duthie 12556* (K!).

3120-4300 m / mont.-alp.: dwarf scrub, forest, rock, scree, scrub, turf (*Abies*, *Betula*, *Bistorta affinis*, *Juniperus communis*, *Picea*, *Pinus wallichiana*) / SW Karakorum, W Himalaya (Swat – Kumaon) / W HIM / he.

Festuca olgae (Regel) Krivot.

CHILAS: Pa: Pattaro Valley, Gutum Sagar >, 4450 m, *Nüsser 1338* (B!).

4450 m / alp. / Tian Shan, E Pamir, NE Iran, E Hindukush, Kunlun, Karakorum, NW Himalaya (Chitral – Lahul, Kunawar) / PAMIR / he.

Festuca rubra L. / Red Fescue (e)

CHILAS: Babusar P. N, 3700 m, *Dickoré 12857* (!).

3700 m / subalp.: avalanche path, scree / Europe, Asia, N America / CIRC POL / he.

subsp. *arctica* (Hackel) Govor.

CHILAS: Babusar P., 4050-4100 m, *Miehe 468* (!). – Ra: Raikot Valley, 3220 m, *Schickhoff 1678* (!). — ASTOR: Da: Doian >, 3350-3660 m, *Duthie 12471* (K!); Mushkin Forest, 3000 m, *Schickhoff 1447* (!), *1434* (!). – As: Gudai Valley, 3350-3660 m, *Duthie 12211* (K!). – Ru: Rupal Gl. ablation valley, 3950 m, *Nüsser 1551* (B!); Rupal Valley, Nagachakali, nunatak, 3500 m, *Nüsser 635* (B!); upper Mazeno Base Camp, 4320 m, *Nüsser 1473* (B!); Zaipur >, 3120 m, *Schickhoff 1049* (!); 3120 m, *Schickhoff 1078* (!).

3000-4320 m / mont.-alp.: forest, turf (*Abies*, *Picea*, *Pinus wallichiana*) / Arctic N hemisphere, on high mountains S to Afgh. (Nuristan), Pakistan (Chitral, Baltistan, Kashmir), Himalaya / CIRC POL / he.

subsp. *rubra*

CHILAS: Go: Martal, 2970 m, *Nüsser 1132* (B!), *1144* (B!). – Ra: Fairy Meadows, 3300 m, *Troll 7640*. – Bu: Buldar Valley, Fary, 2860 m, *Nüsser 1030* (B!); Lichar Valley, Darsh Sagar, 3400 m, *Troll 7610*. — ASTOR: Da: Doian >, 3350-3660 m, *Duthie 12654* (K!). – As: Gudai Valley, 3350-3660 m, *Duthie 12213* (K!); Gurikot, 2500 m, *Troll 7345*; Gurikot Valley, 3400 m, *Troll 7526*. – Ru: Middle Rupal Valley, village Lower Rupal, 3100 m, *Nüsser 1578* (B!); Rupal Valley, 2440-2740 m, *R. R. & I. D. Stewart 22851* (K!); Shaigiri – Lolio Duru, 3650 m, *Troll 7429*.

2440-3660 m / submont.-subalp. / temp. N hemisphere, S to W Himalaya; Sikkim. / CIRC POL / he.

[*Festuca valesiaca* Schleicher ex Gaudin]

CHILAS: Pa: Jiliper Ridge, 3200 m, *Troll 7686* (“var. *valesiaca*”).

3200-3200 m / mont. / Europe, temp. Asia: Turkey, Caucasus – ? NW Pakistan (Gilgit) – Siberia, Mongolia, NW China / EURAS / he.

Doubtful record.

Helictotrichon hookeri (Scribner) Henrard

CHILAS: Ra: Raikot Valley, Kilo Sagar, 3900 m, *Troll 7789* (“*Avena pratensis*”). — ASTOR: As: Gudai Valley, 3660 m, *Duthie 12181* (K!). — Ka: Kalapani Valley, 3400 m, *Troll 8034* (“*Avena pratensis*”).

3400-3900 m / subalp.-alp. / Siberia, Altai, Dzungaria, Tian Shan, Pamir-Alai, SW Karakorum – Ladakh; N America (W) / C AS / he.

Heteropogon contortus (L.) P. Beauv. ex Roem. & Schult.

CHILAS: Go: Darang >, 1450 m, *Dickoré 12705* (!).

1450 m / coll.: semi-desert / trop.-warm temp. / SUBTROP / th.

Hierochloa laxa R. Br. ex Hook. f. / kelotey, kiloji (sh)

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12922* (!). — Bu: Buldar Valley, Mamocha Peak <, 4200 m, *Troll 7851*. — ASTOR: As: Rama Valley, 4020 m, *Nüsser 171* (!). — ASTOR/KASHMIR: Kamri P. top, 4070 m, *Hansen 29* (!).

4020-4210 m / alp.: dwarf scrub, meadow, rock, scree, turf / W Himalaya: Swat – Nepal / W HIM / ge.

NW limit of distribution.

● ***Hordeum vulgare*** L. / yo (sh), Six-rowed Barley (e)

ASTOR: As: Naugam, Hasora, 1847-07-03, *Winterbottom 701* (K!); Rampur (Kazmi & Siddiqui 1953). — Ru: Yackmy, 3280-3340 m (Nüsser 1998). — Ka: Shankargarh (Kazmi & Siddiqui 1953).

3280-3340 m / mont. / th.

Widely cultivated in the montane belt.

Hyparrhenia hirta Stapf

CHILAS: Go: Bunji – Thelichi, 1400 m, *Troll 7190*. — Ra: Darang – Jalipur, 1200 m, *Troll 7169*.

1200-1400 m / coll. / Africa, S Europe, SW Asia (? introduced:) Australia, C. America / SUBTROP / ch.

Next stations: Chitral, lower Swat, but possibly common in the foothills.

Imperata cylindrica (L.) Rauschel

CHILAS: Chilas – Babusar, 1140 m (*Dickoré*).

1140 m / coll. / S Europe, S Asia, Africa, Australia, Chile / SUBTROP / he.

Common in the foothills, also occurs in Gilgit proper.

Koeleria cristata (L.) Pers. (*K. macrantha* (Ledeb.) Schult. & Schult. f.) / Crested Hairgrass (e)

CHILAS: Go: Gor, 3520 m, *Schickhoff 1484* (!); Gor > NW, 2840 m, *Dickoré 12612* (!); Kahlmay, 3610 m, *Nüsser 1091* (B!, cf.); Kahlmay >, 3770 m, *Nüsser 1107* (B!, cf.); Martal, 2930-2970 m, *Nüsser 1076* (B!); *Nüsser 1142* (B!); Martal <, 2650-2680 m, *Nüsser 1171* (B!), *1166* (B!), *1167* (B!). — Pa: Pattaro Valley, Gutum Sagar >, 4450 m, *Nüsser 1341*

(B!). – Ra: Raikot Gl., nunatak, BC, 4000 m, *Troll 7770* (cf., *Koeleria*); 4000 m, *Nüsser 526* (B!); Raikot Valley, Pungadori – Bezar, 3400 m, *Troll 7654*. – Bu: Buldar Valley, Mamocha Peak <, 3500-3800 m, *Troll 7857*; Lichar Valley, Darsh Sagar, 3400 m, *Troll 7613*; Muthat, 2960 m, *Nüsser 1039* (B!). — ASTOR: Da: Upper Harchu Valley, 3500 m, *Nüsser 847* (B!, cf.). – As: Bulan, 2500 m, *Troll 7333*; Los, 2900 m, *Troll 7320*. – Ru: Latobo, Tap Gl. left lateral moraine, 3710 m, *Nüsser 45* (B!); Pattere or Nahake P., Gue [Gurikot] – Pattere, 1856-09-14, *Schlagintweit 6753* (M!); Rupal Gl. ablation valley, 3950 m, *Nüsser 1540* (B!); Rupal Valley, Nagachakali, nunatak, *Nüsser 650* (B!); 3550-3710 m, *Nüsser 620* (B!); upper Mazeno Base Camp, 4320 m, *Nüsser 1474* (B!). – Ka: Faqirkot, 2980 m, *Schickhoff 1314* (!); Kalapani, 3050 m, *Schickhoff 1282* (!); Kalapani – Shankargarh, 3050 m, *R. R. Stewart 22755* (K!).

2500-4450 m / submont.-alp.: dwarf scrub, forest, scrub, steppe-forest (*Artemisia santolinifolia*, *Cedrus*, *Pinus gerardiana*, *Pinus wallichiana*) / Temp. N hemisphere, S to Himalaya (E Afgh.: Nuristan, Pakistan: Baluch., Punjab) / CIRCPOl / he.

Leymus secalinus (Georgi) Tzvelev / khanarkadj (sh)

ASTOR: As: Gudai Valley, 3350-3660 m, *Duthie 12185* (K!). – Ru: Chugam, 2530 m, *Giles 108* (K!); Latobo, 3600 m, *Nüsser 28* (B!, veg.); Rupal Valley, 2590-2740 m, *R. R. & I. D. Stewart 18869* (KUH, RAW, Fl. Pak. 143).

2530-3660 m / submont.-subalp. / Siberia, C. Asia, N Pakistan, Ladakh, Kashmir, NW India, Inner Himalaya / C AS / ge.

Melica persica Kunth (*M. jacquemontii* Decne.)

ASTOR: As: Gurikot – Bulashbar, 2400 m, *Troll 7372* (“var. *lanata*”); Rama above Astor, 3050 m, *R. R. Stewart 22926* (K!). – Ru: Chugam, 2530 m, *Giles 79* (K!). – Ka: Kalapani Valley, 2800 m, *Troll 7977* (“var. *breviflora*”); Shankargarh, *Inayat 25775* (K!).

2400-3050 m / submont.-mont. / SW Asia: Turkey – Afgh., Pakistan (Kurram, Baluch., Chitral, Gilgit); Kashmir, NW India / IRAN / he.

[*Melica scaberrima* (Nees ex Steud.) Hook. f.]

Erroneously reported from Astor (Fl. Karak. 1), but referring to the locality Kalapani in Hazara.

Milium effusum L. / Wood Millet (e)

ASTOR: As: Burzil P. N, Chillam, 3350 m, *R. R. Stewart 22017* (K!). – Ka: Kalapani Valley, 3300 m, *Troll 8024*.

3300-3350 m / mont. / Europe, Asia, N America / CIRCPOl / he.

● ***Panicum miliaceum*** / tzedze (u), Common Millet (e)

ASTOR: Da: Dashkin, 2500 m, *Troll 7897*. – As: Astor, 2310 m (Kazmi & Siddiqui 1953). 2310-2500 m / submont. / th.

Cultivated food-crop; medicinal.

Paspalum dilatatum Poir. / Dallisgrass (e)

CHILAS: Go: Darang >, 1450 m, *Dickoré 12704* (!); Gor, 2000 m (*Dickoré*).

1450-2000 m / coll.-submont.: flush, meadow, ruderal / S America (introduced pantrop.) / SUBTROP / th.

Introduced as a valubale forage grass, naturalised.

Pennisetum flaccidum Griseb.

CHILAS: Go: Gor, 2420 m, *Dickoré* 12667 (!). — ASTOR: Da: Doian, 1930 m (*Dickoré*); Mushkin, 2000 m, *Troll* 7264. — As: Gurikot, 2380 m, *Giles* 74 (K!).

1930-2420 m / coll.-submont.: scrub (*Quercus*) / Kashgaria, Tadzhi-kistan, Afgh., S Karakorum, N Pakistan (Sind, Baluch., Punjab, NWFP, Gilgit), Kashmir, Himalaya – S Tibet, S China / C AS / he.

Pennisetum lanatum Klotzsch / shisho katsh (sh)

CHILAS: Babusar Village >, 2850 m, *Dickoré* 12830 (!). — Go: Gor, 2690 m, *Schickhoff* 1592 (!); 2900 m (*Dickoré*); Martal, 2930 m, *Nüsser* 1073 (B!), 1072 (B!). — ASTOR: As: Gue [Gurikot] – Pattere Brok, 1856-09-13, *Schlagintweit* 6206 (GOET!); Gurikot, 2700 m, *Troll* 7533; Los, 2300 m, *Troll* 7330; Rama <, NE slopes, 2900-3050 m, *E. Nasir & Webster* 6491 (K, RAW!). — Ru: Lower Rupal Valley, 3140 m, *Nüsser* 128 (B!); middle Rupal Valley, vil-lage Lower Rupal, 3100 m, *Nüsser* 1581 (B!). — Ka: Faqirkot, 2800 m, *Hansen* 39c (!); Kalapani – Shankargarh, 2740-3050 m, *R. R. Stewart* 22745 (K!).

2300-3140 m / submont.-mont.: steppe-forest (*Juniperus excelsa*, *Pinus gerardiana*) / W Himalaya: E Afgh. – Uttar Pradesh / W HIM / he.

Pennisetum orientale L. C. M. Richard

CHILAS: Go: Darang >, 1550 m, *Dickoré* 12680 (!); Gor, 1850 m, *Schickhoff* 1459 (!). — Bu: Muthat – Raikot Bridge, 2000 m, *Nüsser* 1059 (B!). — ASTOR: Da: Ramghat, 1200-1800 m, *Troll* 7066; Ramghat – Doian, 1450-1660 m (*Dickoré*).

1200-2000 m / coll.-submont.: semi-desert, steppe (*Artemisia fragrans*, *Heliotropium dasycarpum*, *Stipagrostis plumosa*) / N Africa, Arabia, SW Asia – C. Asia, Himalaya – Nepal, Bhutan, India, Ceylon / SUBTROP / ch.

Phleum alpinum L. / bring kadj (sh), Alpine Cat's-tail (e)

CHILAS: Go: Gor, 3520 m, *Schickhoff* 1506 (!). — ASTOR: Da: Doian, 3000 m, *Troll* 7561. — As: Gurikot Valley, 3600 m, *Troll* 7504. — Ru: Lower Rupal Valley, 3300 m, *Nüsser* 102 (B!); Middle Rupal Valley, village Lower Rupal, 3100 m, *Nüsser* 1577 (B!); Rupal Valley, Bayals, 3160 m, *Nüsser* 592 (B!), 588 (B!). — Ka: Kalapani, 3260 m, *Schickhoff* 1228 (!). 3000-3600 m / mont.-subalp.: forest, scrub (*Abies*) / mountains of N hemisphere S to N Af-rica; Pakistan (Swat, Hazara), Kashmir, Himalaya; N America; Chile / CIRCPO / he.

Phleum himalaicum Mez

CHILAS: Bu: Muthat – Raikot Bridge, 2350 m, *Nüsser* 1045 (B!). — ASTOR: Da: Doian, 2500 m, *Troll* 7244 (“var. *thomsonii*”).

2350-2500 m / submont. / Afgh., Pakistan (Chitral, Swat, Hazara, Gilgit); Kashmir, W Himalaya / W HIM / th.

Phragmites australis (Cav.) Trin. ex Steud. / buh (sh), Common Reed (e)

CHILAS: Gunar Farm, 1160 m (*Dickoré*). — Go: Darang >, 1450 m, *Dickoré* 12700 (!); Gor,

2000 m (*Dickoré*). – Bu: Karakorum Highway, Indus Valley, 1240 m, *Nüsser 1214* (B!). — ASTOR: Ka: Faqirkot, 2800 m, *Hansen 118* (!).

1160-2800 m / coll.-mont.: flush, meadow / temp. regions / COSMO / ge.

Phragmites karka (Retz.) Trin. ex Steud.

ASTOR: Ru: Rupal – Gurikot, 2440-2590 m, *R. R. & I. D. Stewart 18927* (RAW, Fl. Pak. 143).

2440-2590 m / submont. / trop. Africa, trop. & warm temp. Asia, Polynesia, N Australia / SUBTROP / ge.

The presence of the species in the area needs confirmation.

Piptatherum aequiglume (Duthie ex Hook. f.) Roshev.

ASTOR: Ka: Kalapani W, 2740-3050 m, *Duthie 12644* (K, Freitag 1975, isotype “var. *fasciculatum*” Hackel); 3050-3350 m, *Duthie 12644* (W!).

2740-3350 m / mont. / Himalaya: E Afgh. (Nuristan), N Pakistan, Kashmir – China / HIMAL / he.

Piptatherum gracile Mez

CHILAS: Babusar < 3 miles, *S. Abedin & M. Qaiser 9041* (KUH, Fl. Pak. 143). – Go: Martal <, 2650 m, *Nüsser 1169* (B!). – Pa: Pattaro Valley, Zangal, 2600 m, *Troll 7688*. – Ra: Tato – Fairy Meadows, 2800 m, *Troll 7810*. — ASTOR: Da: Dashkin, 2400 m, *Troll 7272*; Ramghat, 1200-1800 m, *Troll 7076*. – As: Das Kirim Valley, Chilim, 3250 m, *Miehe 950808* (!); Gurikot, 2600-3000 m, *Troll 7351*; Rama vicinity, 3350 m, *E. Nasir & Webster 6459* (K!); Rama Valley, 3290 m, *Lankester & Pearson 1481* (BM!).

1200-3350 m / coll.-mont.: forest (*Cedrus*) / Pamir-Alai (apparently rare), S Karakorum, W Himalaya (Chitral – Nepal), S Tibet / W HIM / he.

Piptatherum hilariae Paziš

ASTOR: As: Rama Valley, Sachen Gl. <, 3080 m, *Schickhoff 1037* (!).

3080 m / mont.: forest (*Abies*) / W Pamir, E Afgh., N Pakistan, Kashmir / W HIM / he.

Piptatherum munroi (Stapf) Mez

CHILAS: Go: Gor, 2400 m, *Dickoré 12538* (!); 2420 m, *Dickoré 12671* (!); 2690 m, *Schickhoff 1585* (!); *Schickhoff 1572* (!); Gor > NW, 2840 m, *Dickoré 12610* (!); *Dickoré 12604* (!). —

ASTOR: Da: Mushkin Forest, 2580 m, *Schickhoff 1137* (!); Mushkin RH > SE, 2700 m, *Dickoré 12761* (!). – As: Gudai Valley, 2740-3050 m, *Duthie 12228* (K!); 3350-3660 m, *Duthie 12192* (K!); Rama – Gurikot, 2440-3050 m, *R. R. Stewart 22947* (K!). – Ru: Rupal Valley, 2440-2740 m, *R. R. Stewart 22854* (K!); Tarshing 4 miles SE, 2440 m, *E. Nasir & Webster 6498* (K!). – Ka: Kalapani – Shankargarh, 3350-3660 m, *R. R. Stewart 22746* (K!).

2400-3660 m / submont.-subalp.: forest, scrub, steppe-forest (*Cedrus*, *Pinus gerardiana*, *Pinus wallichiana*, *Quercus*) / Himalaya: E Afgh., N Pakistan, Kashmir – Nepal, S Tibet – W China / HIMAL / he.

Piptatherum vicarium (Grig.) Roshev.

CHILAS: Go: Gor, 1850 m, *Schickhoff 1456* (!). – Bu: Muthat – Raikot Bridge, 2480 m, *Nüsser 1042* (B!).

1850-2480 m / coll.-submont.: steppe (*Artemisia fragrans*) / NE Iran, Afgh., Pamir-Alai, Tian Shan, NW Pakistan (E to Chitral, Swat, Gilgit) / PAMIR / he.

***Poa alpina* L. / Alpine Meadow-grass (e)**

CHILAS: Babusar P., 4050-4100 m, *Miehe 461* (!); Babusar P. N, 3700 m, *Dickoré 12869* (!); Babusar P. NE, 4210 m, *Dickoré 12898* (!). – Ra: Fairy Meadows, 3350 m, *Nüsser 955* (B!, cf.); Ganalo Gl., nunatak, BC, 4200 m, *Nüsser 511* (B!); Kosto Valley, 4150 m, *Nüsser 1446* (B!); Raikot Gl., nunatak, 4050 m, *Nüsser 415* (B!); Raikot Gl., nunatak, BC, 4000 m, *Troll 7748*. — ASTOR: As: Gurikot Valley, 3600 m, *Troll 7507a*; Sati Suce – Das Kirim, *Winterbottom 661* (K!).

3350-4210 m / mont.-alp.: avalanche path, dwarf scrub, rock, scree, turf / circumarctic: Europe, Asia, S to Medit., Caucasus, Tian Shan, Pamir-Alai, W Kunlun, W & S Karakorum, Himalaya: Afgh. (Wakhan, Nuristan) – N Pakistan, Kashmir – W Nepal; N America / CIRCOPOL / he.

***Poa attenuata* Trin. (*P. glauca* subsp. *litwinowiana* (Ovcz.) Tzvelev, *P. araratica* auct., non Trautv.)**

CHILAS: Babusar P., 4300 m, *Miehe 491* (!); *Miehe 512* (!); *Miehe 564* (!); Babusar P. NE, 4210 m, *Dickoré 12926* (!). – Pa: Pattaro Valley, Gutum Sagar >, 4450 m, *Nüsser 1347* (B!). – Ra: Raikot Gl., nunatak, 3880-3900 m, *Nüsser 434* (B!), *418* (B!). – Bu: Lichar Ridge, 4400 m, *Troll 7873*; Lichar Valley, Darsh Sagar, 3400 m, *Troll 7611*. — ASTOR: As: Gudai Valley, 3660 m, *Duthie 12182* (K!); Rama >, near lake, 3380 m, *E. Nasir & Webster 6457* (RAW, Fl. Pak. 143). – Ru: Mazeno High Camp, ascent, 4650 m, *Nüsser 1508* (B!); Rupal Valley, Nagachakali, nunatak, 3500-3620 m, *Nüsser 605* (B!); 3500-3620 m, *Nüsser 633* (B!); upper Rupal Valley, 3500 m, *Troll 7456*.

3380-4650 m / mont.-subniv.: dwarf scrub, rock, scree, turf / C. Asia: Siberia, Altai, Mongolia, Tian Shan, Pamir-Alai, Kunlun, Karakorum, Himalaya, Tibet / C AS / he.

A critical, collective, highly polymorphic species; the name is employed here for an informal group to accommodate the alpine plants of the *P. nemoralis-sterilis* group.

***Poa bulbosa* L. / Bulbous Meadow-grass (e)**

ASTOR: Da: Doian – Turbaling, 2700 m, *Troll 7249*; Turbaling, 2700 m, *Troll 7261*. – Ru: Churit – Bulashbar, 2480 m, *Nüsser 806* (B!); Nahake – Gageh, 3000 m, *Nüsser 773* (B!). 2480-3000 m / submont.-mont. / Europe, Asia / EURAS / he.

Relations to the (usually ?) non-viviparous *P. bactriana* Roshev. and other segregates of the *P. bulbosa* group need re-examination.

***Poa gilgitica* Dickoré**

CHILAS: Go: Gor, 3230 m, *Schickhoff 1520* (!).

3230 m / mont.: forest (*Picea*, *Pinus wallichiana*) / SW Karakorum, Indus Gorge: Upper Chilas, Gilgit, lower Hunza, W Baltistan / ENDEM / he.

***Poa nemoralis* L. / Wood Meadow-grass (e)**

CHILAS: Ra: Raikot Valley, right slope above Fary, 3300 m, *Nüsser 1024* (B!).

3300 m / mont. / temp. Europe, Asia, N America (Pakistan: Swat, Gilgit, Hazara, Kashmir) / CIRCPOl / he.

Poa pratensis L. / ashpekadj (sh), Smooth Meadow-grass (e)

CHILAS: Ra: Fairy Meadows, 3300 m, *Troll 7641*.

3300 m / mont. / Europe, Asia, N America / CIRCPOl / he.

subsp. *pratensis*

CHILAS: Go: Martal, 2930 m, *Nüsser 1081* (B!). – Ra: Fairy Meadows, 3310 m, *Nüsser 1009* (B!), 365 (B!, cf.); Jut, 3310 m, *Nüsser 940* (B!, cf.); Lake Pungadori, 3300 m, *Nüsser 315* (B!, cf.); Nirril Batharet, 3410 m, *Nüsser 997* (B!, cf.); Pungadori, 3290 m, *Nüsser 341* (B!, cf.); Raikot Valley, 3230 m, *Schickhoff 1627* (!). — ASTOR: Da: Doian >, 3050-3350 m, *Duthie 12460* (K!); Harchu Valley, right slope above Baro – Nirril, 3120 m, *Nüsser 890* (B!, cf.); Mushkin RH > SE, 2750 m, *Dickoré 12790* (!). – As: Astor, 2440 m, *Nüsser 901* (B!). – Ru: Latobo, 3600 m, *Nüsser 25* (B!, cf.); Tap Plain, 3460 m, *Nüsser 744* (B!, cf.).

2440-3600 m / submont.-subalp.: forest (*Pinus wallichiana*) / Temp. Europe, Asia, S to Pakistan: Baluch., Punjab, NWFP, Gilgit, Kashmir, Ladakh / EURAS / he.

subsp. *pruinosa* (Korotky) Dickoré

CHILAS: Pa: Pattaro Valley, 3570 m, *Nüsser 1352* (B!). – Ra: Nirril Batharet, 3410 m, *Nüsser 1000* (B!); Raikot Valley, Bayal, 3600 m, *Nüsser 1269* (B!); 3600 m, *Nüsser 1272* (B!); Raikot Valley, Pungadori, 3240 m, *Nüsser 915* (B!). — ASTOR: As: Das Kirim Valley, Chilim, 3250 m, *Miehe 950806* (!).

3240-3600 m / mont.-subalp. / Mongolia, Tian Shan, Pamir-Alai, S Karakorum, W Himalaya / C AS / he.

Poa sterilis M. Bieb.

CHILAS: Go: Gor > NW, 2600 m, *Dickoré 12582* (!); 2900 m, *Dickoré 12616* (!); Gor Gali, 2800 m, *Troll 7106*; Martal <, 2650 m, *Nüsser 1170* (B!). – Pa: Pattaro Valley, 3950 m, *Nüsser 1357* (B!). – Ra: Fairy Meadows, 3300 m, *Troll 7643, 7642*; Raikot Gl., right lateral moraine, 3370 m, *Nüsser 1003* (B!); Raikot Valley, Pungadori – Bezar, 3400 m, *Troll 7655*; Tato – Fairy Meadows, 2930-3060 m, *Nüsser 975* (B!), 978 (B!). – Bu: Fary, Buldar Valley, 2860 m, *Nüsser 1026* (B!); Lichar Valley, Darsh Sagar, 3400 m, *Troll 7612*. — ASTOR: Da: Baro Nirril > right slope, 3230 m, *Nüsser 876* (B!, cf.); Doian, 2400-3000 m, *Troll 7205*; 2440-2740 m, *Giles 212* (K!); Harchu Valley, left slope above Baro Nirril, 3160 m, *Nüsser 856* (B!); Mushkin RH > SE, 2800 m, *Dickoré 12803* (!). – As: Dumusar Valley, 3200 m, *Troll 7531*; Gurikot E, 2500-3000 m, *Troll 7362*; Los, 2400 m, *Troll 7319*. – Ru: Lower Rupal Valley, above Churik, 3500 m, *Nüsser 763* (B!, cf.); Tarishing, 3000 m, *Troll 7500*; Zairpur >, 3120 m, *Schickhoff 1079* (!). – Ka: Faqirkot, 2980 m, *Schickhoff 1334* (!); Kalapani, *Giles 63* (K!).

2400-3950 m / submont.-alp.: forest, steppe-forest (*Abies*, *Picea*, *Pinus gerardiana*, *Pinus wallichiana*, *Quercus*) / S Ukania, Caucasus – Pakistan (NWFP, Gilgit), Kashmir, NW India / IRAN / he.

Poa supina Schrad. / Prostrate Meadow-grass (e)

CHILAS: Babusar P. N, 3520-3570 m, *Dickoré 12843* (!). — ASTOR: Da: Mushkin RH > SE,

2750 m, *Dickoré 12776* (!). – Ru: Lower Rupal Valley, Tarishing Hotel, 2910 m, *Nüsser 780* (B!). – Ka: Kalapani, 3260 m, *Schickhoff 1216* (!).

2750-3570 m / mont.-subalp.: dwarf scrub, forest (*Abies*, *Bistorta affinis*, *Juniperus communis*, *Pinus wallichiana*) / Europe, Asia, S to Afgh. (C. Hindukush, Paghman, Nuristan), SW Karakorum, W Himalaya: Chitral – Nepal / EURAS / he.

Pogonatherum paniceum (Lam.) Hackel

CHILAS: Go: Thelichi, 1500 m, *Troll 7094*.

1500 m / coll. / Africa, S Asia, China, Australia / SUBTROP / he.

Polypogon monspeliensis (L.) Desf. / Annual Beard-grass (e)

CHILAS: Go: Ranote, 2120 m, *Nüsser 1187* (B!). – Ra: Tato, 2400 m, *Troll 7801*.

2120-2400 m / submont. / S Europe, Africa, S Asia; introduced elsewhere / MEDIT / th.

Puccinellia minuta Bor (*P. kashmiriana* Bor)

CHILAS: Babusar P. N, 3700 m, *Dickoré 12870* (!); Babusar P. NE, 4210 m, *Dickoré 12931* (!). — ASTOR: Ka: Kalapani, 3350-3650 m, 1892-08-25, *Duthie 12543* (K!, type of *P. kashmiriana*, Fl. Karak. 1).

3350-4210 m / mont.-alp.: avalanche path, debris, flush, scree, turf / SW Karakorum, NW Himalaya: Chitral, Hazara, Gilgit, Kashmir, Lahul / ENDEM / he.

Rostraria cristata (L.) Tzvelev (*Koeleria phleoides* (Vill.) Pers.)

CHILAS: Go: Darang, 1300 m, *Troll 7164*.

1300 m / coll. / Medit., SW Asia – Pakistan, introd. N America / IRAN / th.

Saccharum filifolium Nees ex Steud.

CHILAS: Go: Indus Valley – Gor, 1860 m, *Nüsser 1070* (B!). – Ra: Darang – Jalipur, 1200 m, *Troll 7170* (“*Erianthus macrantherus*”). – Bu: Muthat – Raikot Bridge, 1300 m, *Nüsser 1068* (B!). — ASTOR: Da: Doian <, 1660 m, *Nüsser 714* (B!); Mushkin, 1950-07-03, *I. I. Chaudhri s.n.* (K, Fl. Karak. 1).

1200-1860 m / coll. / W Himalaya: Afgh. – Nepal / W HIM / ch.

Saccharum ravennae (L.) Murray / furu (sh)

ASTOR: As: Chongra – Gannu, 2400 m, *Hansen 213* (!).

2400 m / submont. / S Europe, SW Asia – Himalaya: N Pakistan, N India, Nepal, ? SE Tibet / MEDIT / ch.

Saccharum spontaneum L.

ASTOR: Da: Bunji, 1300 m, *Troll 7914*; Ramghat Camping Ground, 1680 m, *Duthie 12282* (K, Fl. Pak. 143).

1300-1680 m / coll. / warm-temp. – subtrop. Old World / SUBTROP / he.

Schismus arabicus Nees

CHILAS: Go: Darang, 1600 m, *Troll 7162* (“*S. calycinus*”). — ASTOR: Da: Ramghat, 1200-1800 m, *Troll 7073* (“*S. calycinus*”).

1200-1800 m / coll. / N Africa, Medit., SW & C. Asia / IRAN / th.

● *Setaria italica* / ono (sh), Italian Millet (e)

ASTOR: Da: Harchu, 2000 m, *Troll 7924*.
2000-2000 m / submont. / cultivated / th.

Setaria viridis (L.) P. Beauv. / ching (sh), Green Bristle-grass (e)

CHILAS: Go: Gor, 2100-2160 m (*Dickoré*). – Ra: Tato, 2500 m, *Troll 7813*. — ASTOR: Da: Mushkin Forest, RH – Turbaling, 2700 m, *Nüsser 230* (B!). – Ru: Rupal Valley, 2440 m, *R. R. Stewart 22869* (K, Fl. Pak. 143). – Ka: Faqirkot, 2700 m, *Hansen 194* (!).
2100-2700 m / submont.-mont. / temp. Europe, Asia, N Africa; introduced in Australia, America / EURAS / th.

Stipa brandisii Mez (*S. sibirica* auct., non (L.) Lam.)

CHILAS: Babusar Valley, 2750 m, *Schickhoff 1744* (!).
2750 m / mont.: forest (*Cedrus*) / Himalaya: E Afgh. (Kurram, Nuristan), N Pakistan – SE Tibet, S China (Yunnan) / HIMAL / he.

Stipa concinna Hook. f.

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12896* (!).
4210 m / alp.: dwarf scrub, rock, scree, turf / C. Tian Shan, E Pamir, Karakorum, Tibet, Kashmir, Himalaya / TIBET / he.

Stipa himalaica Roshev.

CHILAS: Go: Martal <, 2650 m, *Nüsser 1173* (B!). – Bu: Muthat – Raikot Bridge, 2480 m, *Nüsser 1041* (B!). — ASTOR: Da: Astor – Bunji, *F. Schmid 3* (K, RAW!); Ramghat, 1200-1800 m, *Troll 7068*. – As: Harchu – Astor, 2180 m (*Dickoré*).
1200-2650 m / coll.-submont. / W Himalaya, E Afgh. – Himachal Pradesh, S Karakorum, Ladakh, SW Tibet / W HIM / he.

Stipa jacquemontii Jaub. & Spach

ASTOR: (Fl. Karak.1).
Baluch. W Himalaya (E Afgh. – Uttar Pradesh), SW Karakorum / W HIM / he.

Stipa pennata subsp. *kirghisorum* (Smirnov) Freitag / Feather Grass (e)

CHILAS: Bu: Muthat – Tato, 3300 m, *Troll 7614* (“*S. joannis*”). — ASTOR: As: Descent from Deotso [Deosai] to Das Kirim, *Winterbottom 890* (K!); Gurikot, Partabgarh, 2700 m, *Troll 7344* (“*S. joannis*”).
2700-3300 m / mont. / W Mongolia, Pamir-Alai, SW Karakorum, Inner W Himalaya: Chitral – Himachal Pradesh (species: Europe, Asia) / PAMIR / he.

Stipagrostis plumosa (L.) Munro ex T. Anders.

CHILAS: Chilas, 1000 m, *Miehe 950104* (!); Chilas – Babusar, 1140 m (*Dickoré*). – Go: Darang >, 1550 m, *Dickoré 12682* (!); Gor, 1160 m, *Schickhoff 1455* (!); 1850 m, *Schickhoff 1457* (!); Ranote <, Haparing, 1900 m, *Nüsser 1209* (B!); Thelichi – Gor Gali, 1700 m, *Troll 7095* (“*Aristida paradisea*”). – Ra: Jalipur, 1200 m, *Troll 7182* (“var. *macranthera*”); Tato

– Raikot Bridge, left slope, 2080 m, *Nüsser 568* (B!). — ASTOR: Da: Ramghat, 1200-1800 m, *Troll 7068a* (“*Aristida paradisea*”); Ramghat – Doian, 1240-1580 m (*Dickoré*). 1000-2080 m / coll.-submont.: river terrace, semi-desert, steppe (*Artemisia fragrans*, *Heliotropium dasycarpum*, *Stipagrostis plumosa*) / *Medit.*, SW Asia – Pakistan, Kashmir / *MEDIT* / ch.

***Tetrapogon villosus* Desf.**

CHILAS: Go: Darang >, 1550 m, *Dickoré 12681* (!); Gor, 1400-1800 m (*Dickoré*); Thelichi, 1260 m, *Dickoré 12511* (!). — Bu: Raikot Bridge – Astor Valley, 1470 m, *Nüsser 910* (B!). — ASTOR: Da: Ramghat, 1200-1800 m, *Troll 7072*; 1500 m (*Dickoré*). 1200-1800 m / coll.: semi-desert (*Heliotropium dasycarpum*, *Stipagrostis plumosa*) / *Canaries*, N Africa, trop. Africa – India / *MEDIT* / he.

***Tripogon purpurascens* Duthie**

CHILAS: Go: Gor, 2400 m, *Dickoré 12540* (!); Gor > NW, 2600 m, *Dickoré 12548* (!). 2400-2600 m / submont.: steppe-forest (*Pinus gerardiana*, *Quercus*) / *Oman*; Pakistan, W Himalaya: Swat – Kashmir, NW India / W *HIM* / he.

[*Trisetum aeneum* (Hook. f.) R. R. Stewart]

ASTOR/KASHMIR: Kamri P., 4000 m, *Troll 8058*. 4000 m / alp. / W Himalaya: Swat – Nepal / W *HIM*. May occur in the area, but usually at much lower altitudes, record probably refers to *T. clarkei*.

***Trisetum clarkei* (Hook. f.) R. R. Stewart**

CHILAS: Babusar P. NE, 4210 m, *Dickoré 12916* (!). — Ra: Kosto Valley, 4300 m, *Nüsser 1426* (B!); Raikot Gl., nunatak, BC, 3990 m, *Nüsser 455* (B!); Raikot Valley, 3560 m, *Schickhoff 1640* (!). — ASTOR: As: Rama Valley, Sachen Gl. <, 3380 m, *Schickhoff 990* (!). 3380-4300 m / mont.-alp.: dwarf scrub, forest, rock, scree, scrub, turf (*Abies*, *Betula*) / W Himalaya: E Afgh. – Nepal / W *HIM* / he.

***Trisetum spicatum* subsp. *himalaicum* Hultén / Narrow False Oat (e)**

CHILAS: Babusar P., 4300 m, *Miehe 484* (!); *Miehe 509* (!); *Miehe 527* (!); Babusar P. NE, 4210 m, *Dickoré 12875* (!). — ASTOR: Ru: Mazeno High Camp, ascent, 4600-4650 m, *Nüsser 1498* (B!), *1504* (B!); Toshain Valley, ascent to Mazeno Gali moraine, 5010 m, *Nüsser 1517* (B!). 4210-5010 m / alp.-subniv.: dwarf scrub, rock, scree, turf / ?Pamir, W Himalaya, Karakorum (*T. spicatum* subsp. *spicatum*: arctic and alpine regions of the N hemisphere) / W *HIM* / he.

The specimens collected by Miehe previously named *T. clarkei* × *spicatum* (Fl. Karak.1) may belong here. Both species are more or less altitudinally vicarious but probably intergrade in areas of contact. The record: Upper Rupal Valley, 3500 m, *Troll 7457a*, seems to be improbable because of the low altitude and may refer to *T. clarkei*.

● *Triticum aestivum* L. / goom, anguru gum, loco gum, panjabi gum, shashir (sh), Bread Wheat (e)

ASTOR: Ru: Churit, 2730-2800 m (*Nüsser*); Tarishing, 2910-2950 m (*Nüsser*). – Ka: Faqirkot, 2700 m, *Hansen 189a* (!); Shankargarh (Kazmi & Siddiqui 1953).

2700-2950 m / mont. / th.

Widely cultivated in the submontane and montane belt up to 3000 m, often as the first crop, followed by maize.

Vulpia myuros (L.) C. C. Gmel. / Rat's-tail Fescue (e)

CHILAS: Go: Gor > NW, 2600 m, *Dickoré 12550* (!), *12563* (!).

2600-2600 m / submont.: steppe-forest (*Pinus gerardiana*, *Quercus*) / C. & S Europe, Medit. – SW & C. Asia, Pakistan, Himalaya (S Karakorum, Kashmir – Bhutan), India, Ceylon / EURAS / th.

● *Zea mays* / makai (sh), Corn, Maize (e)

CHILAS: Babusar Village, 2800 m (*Dickoré*); Chilas – Babusar, 1330 m (*Dickoré*). – Go: Darang, 1200 m (*Nüsser*); Gor, 2000 m (*Dickoré*). – Ra: Tato, 2300 m (*Nüsser*). – Bu: Muthat, 2910 m (*Nüsser*). — ASTOR: Da: Doian, 1880-2600 m (*Dickoré*); Harchu, 2000-2760 m (*Nüsser*). – As: Rampur (Kazmi & Siddiqui 1953). – Ru: Churit, 2750 m (*Nüsser*).

1200-2910 m / coll.-mont. / th.

Cultivated as second crop in lower altitudes, following wheat, above 2000 m as a single crop. Maize remnants are generally used as winter fodder.

× *Agropogon lutosus* (Poir.) P. Fourn. (*Agrostis stolonifera* × *Polypogon monspeliensis*)

CHILAS: Ra: Tato, 2400 m, *Troll 7812*.

2400 m / submont. / th.

Also reported from Lower Swat, Hazara, Kashmir (Fl. Pak. 143).

Iridaceae

Iris hookeriana Foster / nili phul (sh)

CHILAS: Babusar P. N, 3620 m (*Dickoré*). — ASTOR: Da: Harchu Valley, 3100-3500 m, *Troll 7292*; upper Harchu Valley, 3530 m, *Nüsser 840* (B!). – As: Kumu Kolat, 1885, *Giles s.n.* (K!); Rama Valley, Sachen Gl., left ablation valley, 3530 m, *Nüsser 200* (B!); 3530 m, *Nüsser 201* (B!); Suti Suce beyond Burzil P., 1847-06-30, *Winterbottom 83* (K!). – Ru: Latobo S, 3780 m, *Nüsser 89* (B!, cf.); lower Rupal Valley, above Churit, 3560 m, *Nüsser 760* (B!); Rupal Gl. ablation valley, 3950 m, *Nüsser 1544* (B!); Rupal Valley, Nagachakali, nunatak, 3620 m, *Nüsser 613* (B!); 3620 m, *Nüsser 646* (B!). – Ka: Faqirkot, 3300 m, *Hansen 226* (!).

3100-3950 m / mont.-alp. / W Himalaya: Chitral, Gilgit, Swat, Hazara, Kashmir – Garhwal / W HIM / ge.

[*Iris kumaonensis* Wall. ex D. Don]

ASTOR: *Inayat 25894* (Cat. Pak.).

Himalaya: Kashmir – SE Tibet. / HIMAL / ge.
Possible record, but needs confirmation.

Juncaceae

Juncus articulatus L. / Jointed Rush (e)

CHILAS: Go: Ranote, 2120 m, *Nüsser 1193* (B!). – Ra: Tato, 2600 m, *Troll 7808*. — ASTOR: Ka: Faqirkot, 2800 m, *Schickhoff 1373* (!); Rattu, 2700 m, *Troll 7961*; 2800 m, *Miehe 950402* (!); Rattu >, *R. R. & I. D. Stewart 18773* (RAW, Fl. Pak. 138).

2120-2800 m / submont.-mont.: flush, riverside / Europe, Asia, N Africa, N America (introduced in Australia and New Zealand) / CIRCPO / he.

Juncus bufonius L. / Toad Rush (e)

ASTOR: (Fl. Karak.1).

Almost cosmopolitan, pantemperate / COSMO / th.

Juncus himalensis Klotzsch & Garcke (*J. sphacelatus* auct., non Decne.)

CHILAS: Go: Gor > NW, 2950 m, *Dickoré 12647* (!). – Ra: Tato, 2600 m, *Troll 7807*. – Bu: Fary, Buldar Valley, 2860 m, *Nüsser 1028* (B!). — ASTOR: Da: Mushkin, 2290 m, *Giles 559* (K!). – As: Burzil P. N, 3350 m, *R. R. Stewart 21936* (RAW, “*J. sphacelatus*”, Fl. Pak. 138); 3350 m, *R. R. Stewart 19073* (RAW, “*J. sphacelatus*”, Fl. Pak. 138). – Ru: Hasora, N foot of the Dorikoun P., slopes towards Tashing [Tarishing], 1856-10-01, *Schlagintweit 6834* (W!); Tarishing, 2700-3000 m, *Troll 7387*. – Ka: Rattu >, 2740 m, *R. R. & I. D. Stewart 18775* (RAW, *J. sphacelatus*, Fl. Pak. 138). — ASTOR/DEOSAI: Burzil P. top, 3960-4260 m, *R. R. Stewart 19219* (RAW, Fl. Pak. 138).

2290-4260 m / submont.-alp.: forest, flush (*Picea*, *Pinus wallichiana*) / Pamir-Alai, SW Karakorum, Himalaya: Afgh., N Pakistan, Kashmir – SW China (Yunnan) / HIMAL / he.

Juncus inflexus L. (*J. glaucus* Sibth.) / Hard Rush (e)

ASTOR: 1950-07-02, *A. H. Khan* (RAW, Fl. Pak. 138). – Ka: Rattu >, *R. R. & I. D. Stewart* (RAW, Fl. Pak. 138); Rattu, *R. R. Stewart 18807* (Cat. Pak.).

N Africa, Europe, Asia / EURAS / he.

Juncus membranaceus Royle ex D. Don

CHILAS: Go: Gor > NW, 2770 m, *Dickoré 12585* (!); 2950 m, *Dickoré 12646* (!); Martal, 2970 m, *Nüsser 1138* (B!). – Ra: Lake Pungadori, 3300 m, *Nüsser 343* (B!); Tato – Fairy Meadows, 2670 m, *Nüsser 965* (B!). – Bu: Fary, Buldar Valley, 2860 m, *Nüsser 1027* (B!). — ASTOR: As: Bulashbar Bridge, 2420 m, *Nüsser 815* (B!); Chongra, 2500 m, *Troll 7311*. – Ka: Kalapani, 3010 m, *Schickhoff 1199* (!); 3050 m, *Schickhoff 1283a* (!); Rattu >, *R. R. & I. D. Stewart 18775* (RAW, Fl. Pak. 138); Shankargarh, 2930 m, *Giles 655* (K!). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19030* (RAW, Fl. Pak. 138).

2420-3300 m / submont.-mont.: flush, forest, riverside, steppe-forest (*Picea*, *Pinus gerardiana*, *Pinus wallichiana*) / W Tian Shan, Pamir-Alai, Afgh., W Kashg., Karakorum, W Himalaya (Chitral – Sikkim) / PAMIR / he.

Luzula spicata (L.) DC. / Spiked Wood-rush (e)

CHILAS: Go: Kahlimay, 3610 m, *Nüsser 1085/2* (B!). – Pa: Pattaro Valley, Guttum Sagar,

4490 m, *Nüsser 1387* (B!); *Nüsser 1366* (B!); Pattaro Valley, Guttum Sagar – Kosto Gali, 4860 m, *Nüsser 1408* (B!). – Ra: Ganalo Gl., nunatak, BC, 4200 m, *Nüsser 512* (B!); Raikot Gl., nunatak, BC, 4300-4430 m, *Nüsser 486* (B!); *Nüsser 503* (B!). – Bu: Buldar Valley, Mamocha Peak <, 4200 m, *Troll 7863*. — ASTOR: Ru: Mazeno High Camp, ascent, 4550 m, *Nüsser 1490* (B!); Sharsingi Ridge, 4200 m, *Troll 7510*; upper Rupal Valley, 3500 m, *Troll 7458*.

3500-4860 m / subalp.-subniv. / circumarctic, S to Pakistan, Himalaya / CIRC POL / he.

Juncaginaceae

Triglochin palustre L. / Marsh Arrow-grass (e)

ASTOR: Ka: Rattu, *R. R. Stewart* (RAW, Fl. Pak. 48); 2700 m, *Troll 7958*; 2800 m, *Miehe 950406* (!).

2700-2800 m / mont.: fen, meadow, moist / Europe, Asia S to Himalaya, N Africa, N America, S America (Chile) / CIRC POL / he.

Liliaceae

Fritillaria roylei Hook. (*F. cirrhosa* auct., non D. Don)

ASTOR: Ka: Kalapani, 3050 m, *Schickhoff 1278* (!); Kalapani Valley, 3200 m, *Troll 8051*. 3050-3200 m / mont.: dwarf scrub (*Artemisia santolinifolia*) / W Himalaya: Swat – Kashmir, ? Kumaon / W HIM / ge.

Gagea dshungarica Regel

ASTOR: Da: Harchu Valley, right slope above Baro – Nirril, 3230 m, *Nüsser 883* (B!). – Ru: Lower Rupal Valley, Bayals – Chungphare, 3200 m, *Nüsser 792* (B!).

3200-3230 m / mont. / Dzung. Alatau, Tian Shan, W Pamir-Alai, Kopet Dag, Afgh., NW Pakistan / PAMIR / ge.

Gagea elegans Wall. ex D. Don

CHILAS: Go: Kahlimay, 3610 m, *Nüsser 1116* (B!). — ASTOR: Da: Doian, 2700-3500 m, *Troll 7220*; Harchu Valley, 3540 m, *Nüsser 837* (B!). – As: Rama Valley, *Lankester & Pearson 1395* (BM!). – Ru: Lower Rupal Valley, Bayals – Chungphare, 3150 m, *Nüsser 797* (B!); Tap Plain, 3460-3490 m, *Nüsser 724* (B!, cf.), *742* (B!). – Ka: Shankargarh, 2900 m, *Giles 113* (K!). — ASTOR/KASHMIR: Kamri Kotal, 3960 m, *Giles 128* (K!); Rasparin, Gurais, *Winterbottom 222* (K!).

2700-3960 m / mont.-alp. / Himalaya: Chitral – Sikkim, Bhutan / HIMAL / ge.

[*Gagea gageoides* (Zucc.) Vved.]

ASTOR: As: Rama Ridge S, 3400-3900 m, *Troll 7306* (“var. *precedens*”).

3400-3900 m / subalp.-alp. / ge.

[*Gagea granulosa* Turcz.]

ASTOR: As: Rama Ridge S, 3500 m, *Troll 7305*.

3500 m / subalp. / ge.

[*Gagea jaeschkei* Pascher]

ASTOR: Da: Doian, 2800-3400 m, *Troll* 7222. – As: Rama Ridge S, 3500-3900 m, *Troll* 7307. – Ru: Tap – Bazhin Gl., 3500 m, *Troll* 7454.

2800-3900 m / mont.-alp. / ge.

[*Gagea pusilla* Schultes f.]

ASTOR: As: Rama Ridge S, 3500 m, *Troll* 7305a. – Ru: Chichi Valley, 3200 m, *Troll* 7495.

3200-3500 m / mont.-subalp. / ge.

***Gagea setifolia* Baker**

ASTOR: Da: Baro – Nirril > right slope, 3230 m, *Nüsser* 875 (B!); Harchu Valley, left slope above Lathang, 3480 m, *Nüsser* 863 (B!).

3230-3480 m / mont.-subalp. / S Iran, Afgh., Pamir-Alai, NW Pakistan (Kurram, Chitral, SW Karakorum) / IRAN / ge.

***Lilium polyphyllum* D. Don**

ASTOR: Ru: Chichi Valley, 3200 m, *Troll* 7482.

3200 m / mont. / W Himalaya: E Afgh. – Kumaon / W HIM / ge.

Also rare in Gilgit proper.

***Lloydia serotina* (L.) Reichenb. / Snowdon Lily (e)**

CHILAS: Babusar P., 4300 m, *Miehe* 510 (!). – Ra: Kosto Valley, 4300 m, *Nüsser* 1413 (B!).

— ASTOR: Ru: Mazeno High Camp, ascent, 4500 m, *Nüsser* 1487 (B!); upper Rupal Valley, 3700-4000 m, *Troll* 7426. – Ka: Gurais P. N, 1847-06-28, *Winterbottom* 570 (K!).

3700-4500 m / subalp.-subniv.: turf / circumarctic – alp., S to Caucasus, Pamir, Hindukush, Himalaya, Japan / CIRC POL / ge.

***Tulipa clusiana* DC. (*T. stellata* Hook. f.) / mion push (sh)**

ASTOR: Da: Astor – Doian, *Conway* 340 (K!); Harchu Valley, left slope above Baro – Nirril, 3220 m, *Nüsser* 866 (B!). – As: Gudai, 2600 m, *Troll* 7041; Rattu – Gurikot, 2500-2800 m,

F. Schmid 1764 (BM!). – Ru: Lower Rupal Valley, above Churit, 3560 m, *Nüsser* 759 (B!).

– Ka: Faqirkot, 2850 m, *Hansen* 220 (!); Kalapani, 3200 m, *Giles* 157 (K!).

2500-3560 m / submont.-subalp. / Anatolia, Iran, Afgh. – W Himalaya: Nuristan – Uttar Pradesh / IRAN / ge.

Orchidaceae***Coeloglossum viride* (L.) C. J. Hartman / Frog Orchid (e)**

CHILAS: Ra: Raikot Valley, Pungadori, 3300 m, *Nüsser* 923 (B!). — ASTOR: Da: Doian Ridge, 3800 m, *Troll* 7571. – Ru: Chichi Valley, 3200 m, *Troll* 7488.

3200-3800 m / mont.-subalp. / Europe, Asia, S to Caucasus, Tian Shan, Seravshan, Kongur; S Karakorum, Himalaya: Kashmir – Bhutan, SE Tibet; N America / CIRC POL / ge.

***Dactylorhiza hatagirea* (D. Don) Soó / narmada (sh), salap (u)**

ASTOR: Da: Mushkin, 2300 m, *Troll* 7262 (“*Orchis graggerianus*”). – As: Chongra,

3400 m, *Hansen* 208 (!); Gurikot, 2400 m, *Troll* 7549 (“*Orchis graggerianus*”); Rama Val-

ley, 3200 m, *Lankester & Pearson 1223* (BM, Fl. Pak. 164); Teing [Ting] in Hasora, 1847-07-11, *Winterbottom 758* (K!). – Ka: Faqirkot, 2700 m, *Hansen 227* (!); Kalapani, 3010 m, *Schickhoff 1284* (!); Rattu, 2740 m (Kazmi & Siddiqui 1953). — ASTOR/KASHMIR: Kamri (Kazmi & Siddiqui 1953). — ASTOR/DEOSAI: Burzil P., *R. R. Stewart 19037* (RAW, Fl. Pak. 164).

2300-3400 m / submont.-subalp.: fen, meadow, moist, riverside / Himalaya: Chitral – Nepal, Bhutan, SE Tibet / HIMAL / ge.

Medicinal.

Epipactis helleborine (L.) Crantz (*E. consimilis* D. Don, *E. macrostachya* Lindl. ex Wall.) / Broad-leaved Helleborine (e)

ASTOR: Da: Astor – Mushkin Forest, *Duthie 12264* (E, Fl. Pak. 164); Doian, 2500 m, *Troll 7903*; Mushkin Forest, 2580 m, *Schickhoff 1128* (!, veg.); Mushkin RH <, 2580 m, *Dickoré 12733* (!).

2500-2580 m / submont.: forest, moist (*Pinus wallichiana*, *Salix wallichiana*) / Europe, Asia S to Medit., SW Asia – E Siberia; Himalaya: Pakistan – Bhutan, SE Tibet; N America / CIRCPO / ge.

Epipactis veratrifolia Boiss. & Hohen.

CHILAS: Ra: Jalipur, 1200 m, *Troll 7177*.

1200 m / coll. / Turkey, Cyprus, Palestine, Syria, Sinai; Somalia, Iran – Afgh., Himalaya (Chitral – Nepal) / IRAN / ge.

Epipogium aphyllum (Schmidt) Swartz / Ghost Orchid (e)

ASTOR: Da: Mushkin RH > SE, 2800 m, *Dickoré 12799* (!).

2800 m / mont.: forest, moist (*Abies*, *Pinus wallichiana*) / Europe, Asia, S to Himalaya / EURAS / ge.

A few specimens in dense moist forest. Probably new to the Flora of Pakistan, more common in the Himalaya E of Kashmir.

Goodyera repens (L.) R. Br. / Creeping Lady's-tresses (e)

CHILAS: Ra: Raikot Valley, 3220 m, *Schickhoff 1687* (!).

3220 m / mont.: forest (*Pinus wallichiana*) / Europe, Asia S to SW Asia, Afgh. (Kurram), Himalaya: Pakistan – Bhutan, SE Tibet, Assam; N America / CIRCPO / he.

Herminium monorchis (L.) R. Br. / Musk Orchid (e)

ASTOR: Hasora, *Winterbottom 742* (K, Fl. Pak. 164). – As: Rama, 3200 m, *Lankester & Pearson 1299* (BM, Fl. Pak. 164). – Ru: Tarishing, 2600 m, *R. R. Stewart 18848* (RAW, Fl. Pak. 164).

2600-3200 m / submont.-mont.: moist, turf / Europe, Asia, S to Himalaya, S Tibet, China, Japan / EURAS / ge.

Malaxis muscifera (Lindl.) Kuntze

ASTOR/KASHMIR: Kamri, *R. R. & I. D. Stewart 18638* (RAW, Fl. Pak. 164).

Himalaya: Pakistan – SE Tibet, SW China / HIMAL / ge.

Sparganiaceae

Sparganium emersum Rehmann (*S. simplex* Hudson) / Unbranched Bur-reed (e)

ASTOR: As: Rama, 3050 m, *R. R. Stewart* 22873 (K!); 3050 m, *Webster* 6442 (K!); 3050 m, *R. R. Stewart* 22944 (K!).

3050 m / mont. / Europe, Asia, N America / CIRCPOLE / he.

The only locality known in the Himalaya.

6. Phytogeography and diversity

Correlations between vegetation and climatic gradients and their variability in space and time are of paramount interest in contemporary approaches to the ecology of high mountain areas in the Karakorum and the W Himalaya (Weiers 1995, Braun 1996, Miede & al. 1996, Cramer 1997, Richter & al. 1999). The present Flora presents a first taxonomic data base, which, however, may still be insufficient for more general conclusions.

Plant distribution and diversity is intimately linked to geological, tectonic and other paleo-geographical conditions. As the western promontory of the Indian plate, the Nanga Parbat-Haramosh syntaxis possesses a key position of direct contact with the Eurasiatic plate group. Topographically, the Nanga Parbat massif and surrounding valleys probably are important paths for the migration of Himalayan elements into the Central Asiatic flora of the Karakorum and vice-versa.

6.1. Species number

Considering the dimensions of the mountain massif and its degree of thermo-hygic variation, the total number of 962 species (plus 106 regarded as doubtful or improbable) seems to be low. Further research may certainly reveal substantial additions to the flora of Nanga Parbat, though these will probably be largely confined to the marginal areas adjoining the S slope of the Himalaya, i.e. Hazara and Kashmir. It should also be considered that the present species list contains a certain number of probably ill-founded or misidentified taxa, accepted on tentative grounds at present, which may be clarified through further bio-systematic research. Due to the prevailing incomplete or largely national or regional taxonomies, species numbers of the Central Asiatic mountains seem to be often over-estimated (Dickoré 1995).

The inclusion of the Nanga Parbat area into "diversity zone" (abbreviation: DZ) 7, comprising 2000-3000 species per 10 000 km² (Barthlott & al. 1996), may be considered a cartographical mistake. Although the species number of the smaller area dealt with in the present study (6700 km²) cannot simply be superimposed onto the standard area (Evans & al. 1955), Nanga Parbat would most likely fall into DZ 5 (1000-1500 species per 10 000 km²). The most prominent diversity gradient is a marked decrease of species numbers across the SW-NE transect from the Himalayan S slope of Hazara and Kashmir (DZ 6, 1500-2000 or DZ 7, 2000-3000 species) to the Central and N Karakorum (DZ 3, 200-500 species, possibly less), which is suggested by current studies (Karakorum: Batura, unpublished; K2-North, Dickoré 1991).

From an ecological point of view, the low species number in the area under consideration is basically linked to the prevailing semi-arid conditions. Following Schroeder (1998), the altitudinal sequence can to a great extent be paralleled with major latitudinal climax formations. Even though the middle altitudes manifest varied features of semi-arid to sub-humid steppe and coniferous forest vegetation, the potentially species-rich formations of nemoral deciduous forests are completely absent. Similarly, the altitudinal equivalent of the meridional zone on Nanga Parbat is semi-arid at its best. The *Quercus baloot* sclerophyllous forest is on the very thermo-hygic edge of its distribution, without any approximations to laurophyllous forest types. The topographic profile is further limited

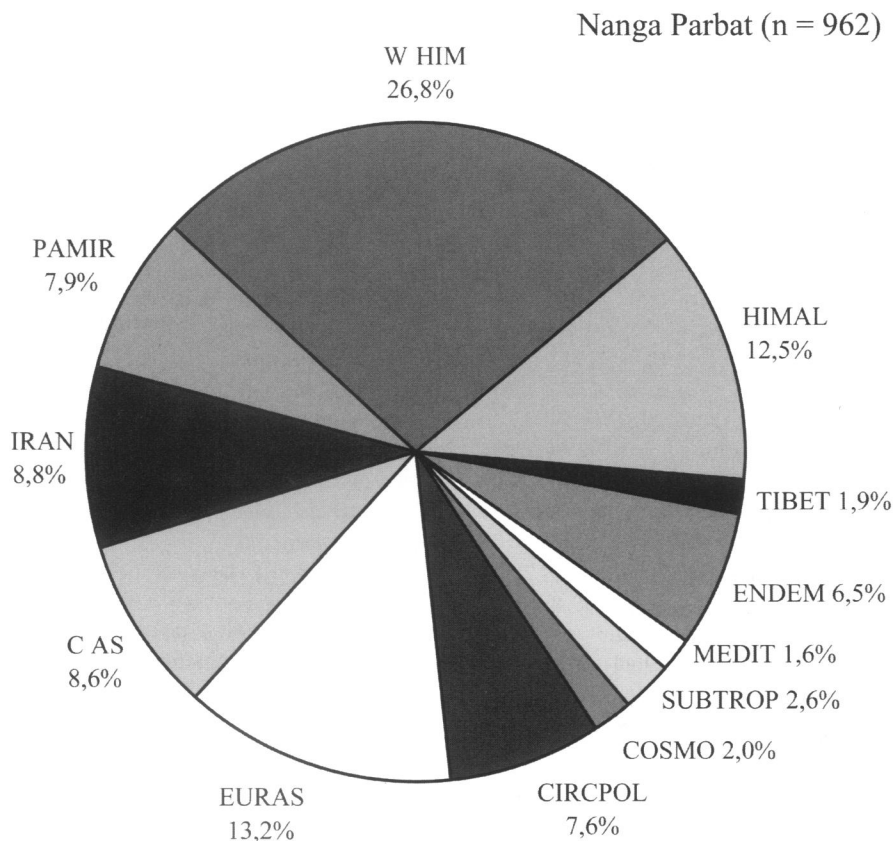


Fig. 11. Phytogeographical elements in the flora of Nanga Parbat.

hygrically by extremely arid conditions at its lower edge. Probably as a result of thermic limitations, the remaining semi-humid boreal forests as well as the arctic-alpine dwarf-scrub and turf vegetation at the upper edge of the profile do not contribute significantly to the species number.

6.2. Phytogeographical settings

Although the general character of the vegetation on the dry northwest edge of the Himalayas is physiognomically reminiscent of a Central Asiatic type (Troll 1939), W Himalayan elements can be shown to dominate floristically. According to a rough phytogeographical analysis of the total flora of Nanga Parbat (Fig. 11), the area may still be included into the Himalayan floristic

Tab. 3. Microarealophytes and their altitudinal distribution on Nanga Parbat.

Taxon	Altitude (m)	Taxon	Altitude (m)
<i>Alchemilla trollii</i>	3400	<i>Euphrasia incisa</i>	2550-2600
<i>Alchemilla ypsilotoma</i>		<i>Euphrasia remota</i>	2700
<i>Androsace aizoon</i>	2280-3570	<i>Ferula narthex</i>	1900-2800
<i>Androsace baltistanica</i>	3520-3960	<i>Geranium swatense</i>	2740-3810
<i>Androsace duthieana</i>	3960	<i>Haloxylon thomsonii</i>	1000-1880
<i>Androsace muscoidea</i>	3350-4300	<i>Haplophyllum gilesii</i>	1200-2180
<i>Androsace thomsonii</i>	2400-3960	<i>Hedysarum cachemirianum</i>	4000
<i>Aphragmus obscurus</i>	3960-4260	<i>Inula clarkei</i>	2000-2430
<i>Aquilegia nivalis</i>	3580-3700	<i>Megacarpaea bifida</i>	3650
<i>Arabis saxicola</i>	3040-3350	<i>Nepeta adenophyta</i>	3000-3200
<i>Arabis tenuirostris</i>	3040	<i>Nepeta connata</i>	2600-3500
<i>Astragalus falconeri</i>	2590-2800	<i>Poa gilgitica</i>	3230
<i>Astragalus maxwellii</i>	2700-3300	<i>Potentilla curviseta</i>	3700
<i>Bupleurum canaliculatum</i>	2600-3200	<i>Primula duthieana</i>	3650-4260
<i>Bupleurum clarkeanum</i>	3100-3950	<i>Primula inayatii</i>	
<i>Bupleurum swatianum</i>		<i>Pseudomertensia eformicata</i>	2280-3540
<i>Calamagrostis decora</i>	2740-3660	<i>Puccinellia minuta</i>	3350-4210
<i>Calamagrostis stoliczkae</i>	3880-3950	<i>Ranunculus karakoramicola</i>	3300-4490
<i>Caltha alba</i>	2910-3960	<i>Ranunculus munroanus</i>	4050-4100
<i>Colpodium nutans</i>	3350-3660	<i>Rhamnella gilgitica</i>	1600-2450
<i>Corispermum ladakhianum</i>	1240	<i>Rhodiola pachyclados</i>	3200
<i>Corydalis clarkei</i>	3650-4570	<i>Saussurea chenopodiifolia</i>	2160-3320
<i>Crepis kashmirica</i>		<i>Saussurea costus</i>	3300-3440
<i>Dictyolimon gilesii</i>	1200-1800	<i>Senecio tibeticus</i>	2400-4200
<i>Draba cachemirica</i>	3350	<i>Swertia thomsonii</i>	
<i>Echinops prionolepis</i>	1000-2050	<i>Taraxacum kashmirensis</i>	
<i>Erigeron anisophyllus</i>	2700-2950	<i>Taraxacum pseudo-stevenii</i>	4300
<i>Erigeron cyanactis</i>	2580-3100	<i>Taraxacum stereodiforme</i>	3290
<i>Erysimum cachemiricum</i>		<i>Tricholepis tibetica</i>	1200-2280
<i>Euphorbia micractina</i>		<i>Valeriana clarkei</i>	2600-2750
<i>Euphorbia thyrsoidea</i>		<i>Vicia benthamiana</i>	2740-3350
<i>Euphrasia densiflora</i>			

region. W Himalayan (W HIM) and Himalayan (HIMAL) elements comprise together 39.3 % of the total species number.

Generally speaking the distribution areas of the W Himalayan elements extend from E Afghanistan to W Nepal, or even further eastwards into the inner transitional mountain zone. W Himalayan elements prevail across a characteristically wide zone ranging from Swat, over the area between Indus and Kashmir, into the SW Karakorum, whereas the zone

is “squeezed”, as it were, into a narrow strip further eastwards, along the SW edge of the Tibetan Plateau. The more widely distributed Sino-Himalayan elements can be considered as more characteristic for the Outer Himalayas. They are probably of a more eastern origin and may be found also in the E Himalayas, S and E Tibet or China.

Irano-Turanian (IRAN), Pamiran (PAMIR), Central Asiatic (C AS) and Tibetan (TIBET) elements accounting for 25.3 % of the taxa, form the second most important phytogeographical group in the flora of Nanga Parbat.

The first two of these characterise the winter-rain regions of SW Asia. Considering the fact that Nanga Parbat marks the extreme SE edge of distribution for many of these taxa, the proportion of Irano-Turanian and Pamiran elements (the latter basically a high montane subgroup of the former on the western rim of High Asia) seems to be particularly large. Central Asiatic elements correspond to the generally arid conditions at lower altitudes, but include also alpine species distributed over large areas of High Asia. Although few taxa may be ascribed to the Tibetan elements, the particularly poor representation on Nanga Parbat is indicative of the mountain’s isolated position.

A large number of species (20.8 %) belongs to the widespread Eurasiatic (EURAS) and circumpolar (CIRCPOL) sectors on the chart (Fig. 11). Eurasiatic elements are particularly well represented in the middle altitudes of Nanga Parbat. The massif represents an unexpected “stronghold” of this group in the Himalayas. The distribution of Eurasiatic elements, normally continuous only northwards of the Altai, is often sparse, with only widely scattered and disjunct occurrences, as e.g. in the Tian Shan and Seravshan mountains. The presence of circumpolar elements seems to be more significant in the flora of High Asia.

Cosmopolitan (COSMO) elements (mostly weeds), subtropical elements (SUPTROP, including marginally tropical taxa), and Mediterranean elements (MEDIT, with usually a more limited distribution than the latter group), sum up to 6.2 %, forming minor constituents of the flora of Nanga Parbat. This corresponds apparently with the small surface area and extreme aridity at lower altitudes.

Endemics (“microarealophytes”, ENDEM), though difficult to define from a geographic and taxonomic point of view, amount for only 6.5 %. A similar value was found for the monocots of the Karakorum (Dickoré 1995: 7 %). Although the list of microarealophytes (Tab. 3) is not a long one, it contains several species of biogeographical or potential economic interest. Many of these are found only in Pakistan and adjacent Kashmir and deserve special conservation efforts by the local authorities.

6.3. Regional variation

The species numbers and phytogeographical elements of the divisions of the Nanga Parbat area (Tab. 4) tallies in general with the subareas. The comparatively low species numbers for the Pattaro and Buldar subareas are certainly related to the relatively smaller surface and/or less thorough investigation of these areas. The numbers for the marginal passes (Astor/Kashmir, Astor/Deosai, Astor/Skardu) are not representative.

As for the spatial representation of phytogeographical elements, the overall similarities are surprising, since the general character of the vegetation has been reported to differ significantly towards the Kashmir border (Troll 1939). There is but a slightly increased propor-

Tab. 4. Species numbers and representation of phytogeographical elements in divisions and subareas (abbreviations see Tab. 1; A/K: Astor/Kashmir, A/D: Astor/Deosai, A/S: Astor/Skardu).

Element	Chilas	Go	Pa	Ra	Bu	Astor	Da	As	Ru	Ka	A/K	A/D	A/S	Sum
COSMO	13	8		2	2	14	7	8	2	4				19
CIRCPOL	44	17	13	30	6	56	19	32	33	32	3	12	1	73
EURAS	70	39	8	32	8	108	46	58	49	53	10	16		127
CAS	58	25	16	36	10	65	36	41	40	23	9	16		83
IRAN	46	30	5	17	9	75	53	34	19	19	2	6		85
PAMIR	56	27	20	33	11	64	23	38	40	26	11	14	4	76
W HIM	163	76	45	79	34	202	79	119	95	106	61	78	3	258
HIMAL	69	32	14	28	13	93	34	45	39	53	25	29	2	120
TIBET	15	2	6	8	1	9	1	5	8		1	3	2	18
ENDEM	28	15	4	10	6	46	22	21	17	20	10	13	1	63
MEDIT	12	9		5	4	11	9	4	1	2		1		15
SUBTROP	23	19		5	5	7	6		1					25
Total	597	299	131	285	109	750	335	405	344	338	132	188	12	962

tion of Sino-Himalayan elements in the Kalapani subarea. It might be assumed that, although markedly transitional, the Nanga Parbat area as defined here comprises a remarkably uniform floristic inventory. Obviously, the differences between both ends of the peripheral-central gradient, between the Outer Himalayas and the Karakorum (Dickoré 1995), could be expected to be more marked.

6.4. Altitudinal diversity

The mountain massif of Nanga Parbat provides all scales and directions of aspect and microclimatic differentiation. These factors govern notably the altitudinal distribution of vegetation types and plant species. It seems, however, problematic to identify these properties on any other than a local scale and on the basis of limited species inventories. The attempt by Richter & al. (1999) to describe aspect and altitudinal effects along a transect from Tian Shan to the W Himalaya is controversial because of a possibly insufficient data basis.

Regardless of local factors of aspect and slope, total altitudinal range for individual species on Nanga Parbat rarely exceeds an interval of 1000 m. The vertical distribution of species diversity (minimum – maximum, taxa of unknown altitudinal range omitted), represented as a curve, is of an almost regular unimodal type (Fig. 12-15). The only notable irregularity is found near the plateau – a slight, apparently linear increase of species number below, i.e., 2400 m.

The altitudinal distribution of diversity and proportions of life-forms (Fig. 12-13) and phytogeographical elements (Fig. 14-15) seems to correspond to a moderately differentiated universal model of altitudinal classification, though supra-regional generalisations, again, might be problematic. Each of the postulated altitudinal belts corresponds to apparently well defined sections.

Most of the linear lower section would fall into the colline belt, followed by a steep increase of species number with a rise into the submontane belt. The colline belt is characterised by balanced proportions of various different phytogeographical elements and almost equal proportions of chamaephytes, hemicryptophytes and therophytes, whereas the maximum diversity of phanerophytes marks the border of the colline and submontane belts. Subtropical and Mediterranean elements decrease in number continuously with altitude and vanish altogether at the border between the submontane and montane belts, where the proportion of Eurasiatic elements attains a maximum. The montane belt accommodates the maximum diversity of species and is dominated by hemicryptophytes and Himalayan elements. Decreasing species numbers are characteristic of the subalpine belt with the proportion of hemicryptophytes still increasing: a trend that continues into the alpine belt. Here the spectrum of life-forms is almost reduced to hemicryptophytes and chamaephytes, at higher altitudes phanerophytes and Eurasiatic elements in general disappear, with Tibetan elements taking their place. The subnival belt represents an asymptotic approximation of the species number to zero, with a much reduced spectrum of life-forms and phytogeographical elements. Interestingly, the proportion of endemics seems to be almost constant in all but the highest altitudes. Controversies regarding the "qualities" of endemism (degree of taxonomic and geographical isolation) would possibly lead to a more obvious concentration at relatively lower altitudes.

Fig. 12. Altitudinal distribution of life forms (species number).

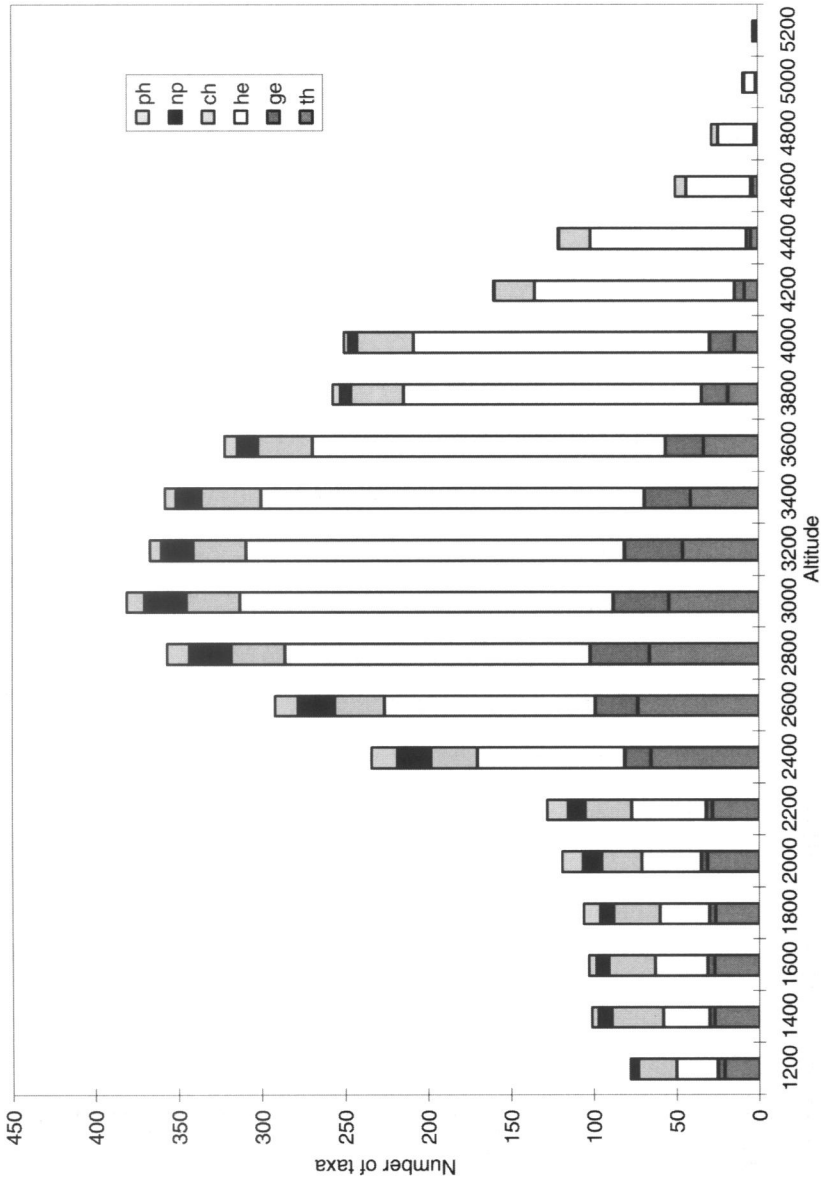


Fig. 13. Altitudinal distribution of life forms [%].

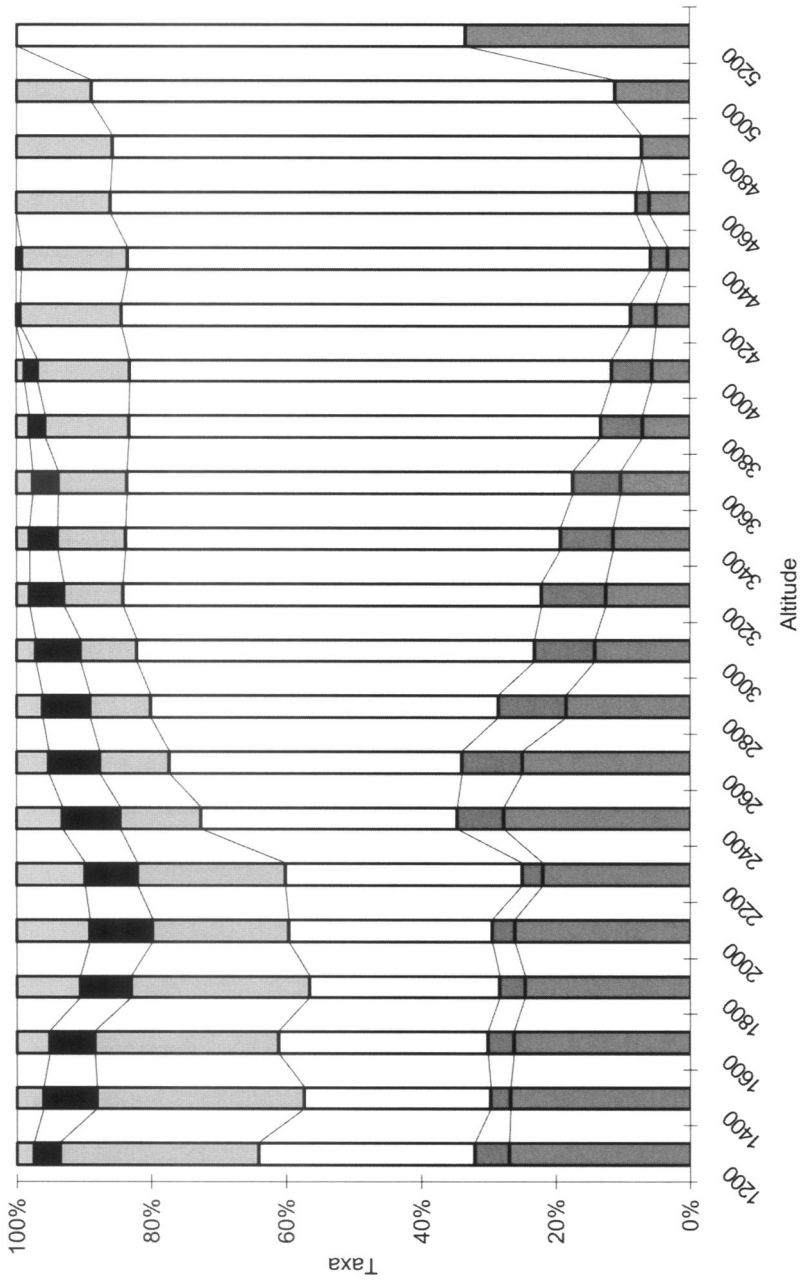


Fig. 14. Altitudinal distribution of phytogeographical elements (species number).

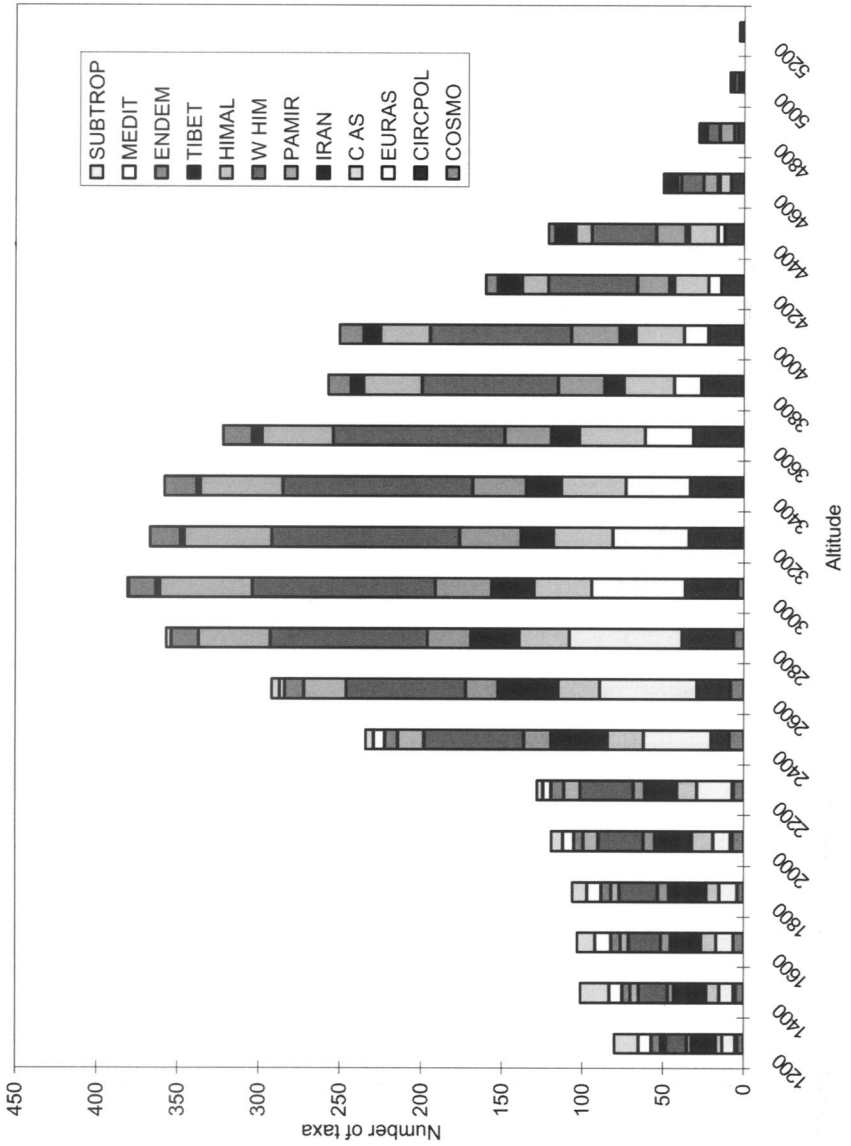
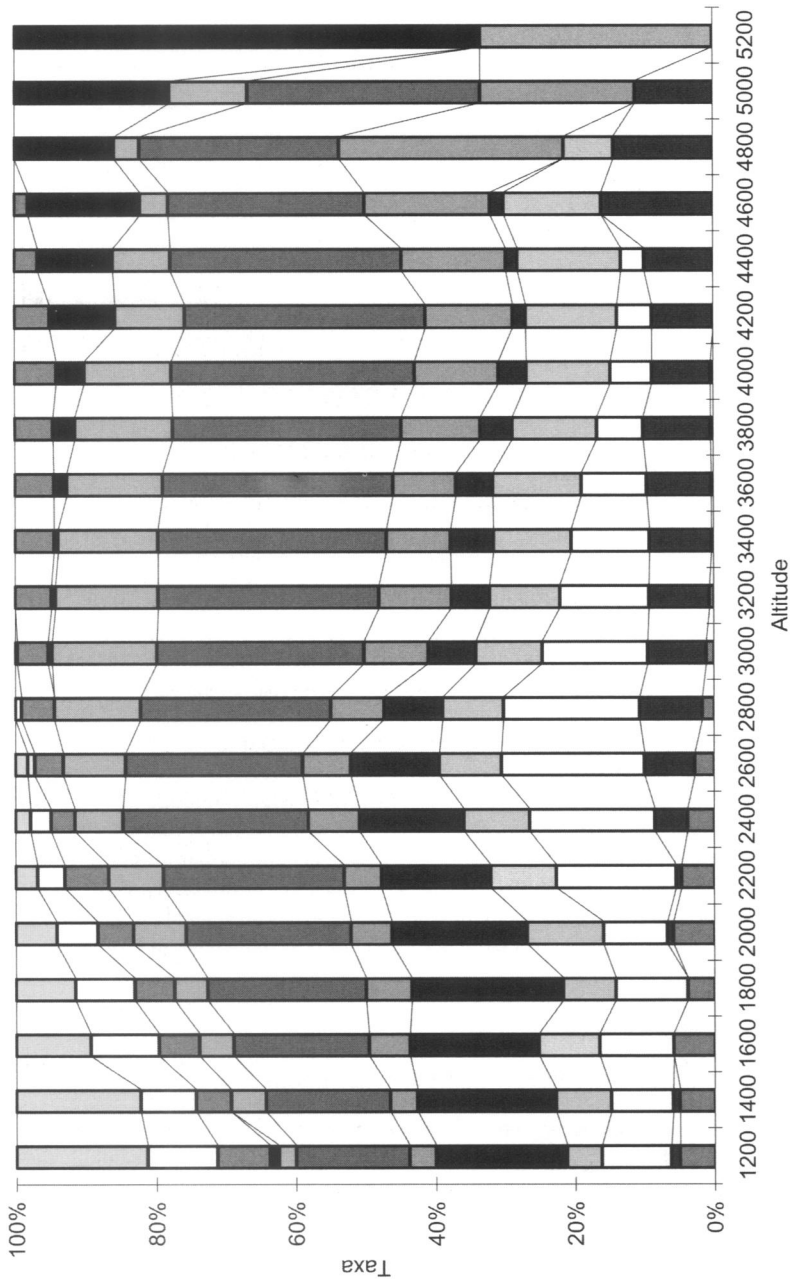


Fig. 15. Altitudinal distribution of phytogeographical elements [%].



7. Vegetation dynamics and human impact

7.1. Anthropogenous transformation of vegetation

When land use systems in high mountain environments are considered, the vegetation plays a key role in the assessment of sustainable resource utilisation. In the Nanga Parbat area, animal husbandry, fuel-wood collecting, and timber logging are integral parts of the traditional village economies. Consequently, recent vegetational changes have to be interpreted in the light of anthropogenous impact. The state of the forests and high altitude pastures has changed due to human impact over a long period of time. The present vegetation types must therefore be interpreted as integral parts of a cultural landscape, transformed by regional utilisation systems, which depend on changing socio-economic conditions (Clemens & Nüsser 2000). When discussing the sustainability of resource utilisation, factors like high population growth (c. 3 % per year, Clemens & Nüsser 1994) and improved access to this high mountain area need to be considered. The extent of deforestation and pasture degradation in the valleys of Nanga Parbat corresponds to an increasing utilisation pressure over the last decades and reveals strong local differences (Fig. 16-21).

Nowadays, the coniferous trees (*Abies pindrow*, *Cedrus deodara*, *Picea smithiana*, *Pinus gerardina*, *P. wallichiana*, *Juniperus excelsa*, *Juniperus semiglobosa*) are among the economically most important resources of the area. Since the completion of the Karakorum Highway in 1978 large scale timber export combined with general population pressure and scarcity of fuel-wood and fodder led to problems of carrying capacity and management strategies (Schickhoff 1996a, 1999).

As for the distribution maps of the forest trees of N Pakistan (*Cedrus deodara*, *Pinus wallichiana*, *Picea smithiana*, *Abies pindrow*) presented by Schickhoff (1995b), it should be considered that the actual distribution areas are much more limited and isolated than might be inferred from the hatched areas in these maps. Although the distribution areas of *Pinus wallichiana* and *Picea smithiana* extend well into the SW Karakorum, all these trees, notably *Abies* and *Cedrus*, are climatically on their very NW edge of distribution in the Nanga Parbat area. A recent and considerable decline in the forest cover of N Pakistan, caused by the local demand for fire-wood as well as commercial timber logging, has been described by Schickhoff (1995a, 1996a, 1999). The growing demand for fuel-wood and construction wood caused by the population increase has been met to a certain degree by the cultivation of fast-growing woody species like *Salix sericocarpa* and *Populus* spp.

7.2. Repeat photography

Based on visual interpretation of repeat photography, current vegetation dynamics in the Nanga Parbat region can be discussed. For the Nanga Parbat region, a comprehensive collection of historical landscape photographs taken by members of the German Himalaya Expeditions of 1934 and 1937 (Finsterwalder 1938, Troll 1939) forms a valuable data base for comparative studies. Recent fieldwork rendered it possible to repeat some of these photographs from viewpoints identical to the earlier ones, which serve to illustrate vegetation changes over the last sixty years (Figs. 16-21, for more examples see Nüsser & Clemens 1996, Nüsser 1998, for Hunza see Winiger 1996). The examples presented here focus on the

dynamics of montane coniferous forests, submontane *Quercus baloot* forests, and the scattered *Juniperus semiglobosa* stands of the submontane and montane belts.

The montane coniferous forests of the Nanga Parbat area are integrated into a land use system to meet the requirements of the local mountain dwellers. These forests are locally characterised by a gradual decline though in places the changes are certainly drastic owing to local over-exploitation. The example of Raikot Valley shows that the improved road accessibility, extension of crop cultivation and pasture clearings near Fairy Meadows (3300 m), as well as problems of forest ownership have led to large scale timber exploitation and to a loss of previously forested areas (Schickhoff 1996a, Nüsser 1998). On the other hand, one can detect a significant expansion of *Pinus wallichiana*-*Picea smithiana* forests on the lateral moraines of the retreating Raikot Glacier (Fig. 16, 17) proving a high potential reproduction rate. This example of repeat photography also proves a progressive succession of hygrophilous *Salix sericocarpa* and *Myricaria germanica* bushes along the glacio-fluvial stream over the 60-year interim.

The submontane *Quercus baloot* forests on the slopes of Gor are preponderantly exposed to SE. These forests offer an additional fodder source in winter. Apparently, only a slight change in the evergreen oaks near the village has taken place over the 58 years (Fig. 18, 19). Thanks to traditional rules and regulations, such as the ban on forest pasturing as well as the lopping of branches and leaves for fodder before mid November, the *Quercus baloot* forests have become an example of sustainable resource utilisation (Nüsser 1998). In both photographs (Fig. 18, 19), one can identify *Quercus baloot* trees, which still exist after 60 years but have changed their physiognomy because of lopping for winter fodder. Institutional arrangements have succeeded in preserving these woodlands until the present day.

Like the open *Pinus gerardiana* forests of the submontane belt, the scattered juniper stands near the settlements are generally degraded, in some cases completely destroyed, with over-grazing probably severely inhibiting their rejuvenation. Over-exploitation of the Mushkin forest appears to be directly related to frequent landslides on the lower Astor road, as could be observed in 1994 and 1995. The forests of Gor are also under heavy utilisation, though erosion effects appear to be less severe, due to the more gentle relief and the absence of major roads. In the lower Rupal Valley (Fig. 20, 21) the sparsely distributed *Juniperus semiglobosa* thickets and trees on the slopes facing southwards, detectable on the photograph from 1934 (Fig. 20) as easily distinguishable dark spots near the settlements, are an important fuel-wood. Because of the less dense snow cover and its earlier melting time on these southern slopes, *J. semiglobosa* is collected for fuel-wood between winter and spring (Clemens & Nüsser 1997).

The documentation of vegetation dynamics shows that changes within the last six decades have not reached an extent, which can be described as environmental deterioration. Until the present day, the development of the cultural landscape in the Nanga Parbat region is characterised by a land use system which is highly adapted to natural resource potentials on the one hand, but it also reveals an increasing pressure on the forest resources on the other. In particular the more accessible forest stands in the vicinity of the settlements and near the lower timber line have been seriously depleted due to uncontrolled felling and intensive forest pasturing. In comparison, the situation of submontane oak forests in Gor looks more stable. Obviously, timber-exploitation and grazing intensity seem to have been controlled to a certain degree by the local communities (Nüsser 1998).

This pair of photographs, taken from Fairy Meadows (3300 m) show the scree-covered Raikot Glacier with montane conifer forests (*Pinus wallichiana*, *Picea smithiana*) on the lateral moraines; the view is towards S. Between 1934 and 1994 the glacier has retreated and the position of the glacier tongue has moved about 50 m further up. The inner slopes of the moraines are occupied by *Hedysarum falconeri*. The fence in the right corner still separates the summer settlement with cultivation from the summer pasture settlement, both lying on the same glacial terrace.



Fig. 16. Raikot Glacier (R. Finsterwalder, 1934-05-16).



Fig. 17. Raikot Glacier (M. Nüsser, 1994-06-02).

These photos from 2600 m show the region of Gor (2440-2450 m) with the villages Losnote, Dabote, and Gochote, the colline and submontane belts of the Indus Valley, and the northern declivity of Nanga Parbat with summit and Chongra Peak in the background; the view is towards SE.



Fig. 18 (oben). Gor (C. Troll, 1937-05-21). Fig. 19 (unten). Gor (M. Nüsser, 1995-09-04).

This pair of photographs from 3830 m show the lower Rupal Valley with the village of Churit (2733 m) and other settlements on different morainic terraces and S facing slopes; the view is towards N. The two photographs confirm the expansion of settlements as well as the extension of irrigated fields.



Fig. 20. Lower Rupal Valley with Village Churit (R. Finsterwalder, 1934-06-21).



Fig. 21. Lower Rupal Valley with Village Churit (M. Nüsser, 1994-07-22).

8. Discussion

More detailed investigations into the phytogeographical affinities of the Nanga Parbat region will specify the often wide total distribution areas of the respective taxa. Considering prevailing and unsolved taxonomic and chorological problems, our rough approximation of phytogeographical elements (and life-forms) could at best be regarded as a complex (and incidentally false) approach towards the understanding of distribution patterns. Meusel & Schubert (1971) and Meusel (1972) provide valuable distribution maps and chorological data, Dickoré (1995), additional regional distribution maps. Intense systematic and biogeographical research is needed to verify or specify some of our assumptions:

1. Troll's (1937, 1939) statement that Nanga Parbat bears a greatly depauperate flora as compared to the monsoon-influenced S declivity of the Himalayas, may be specified: The bulk of the "tertiary relict" flora of (Hircanian-) Sino-Himalayan elements (*Pinus roxburghii*, *Parrotiopsis jacquemontiana*, *Acer cappadocicum*, *Aesculus indica* and many others) does not occur in the area, although many of these species are distributed as far W as E Afghanistan or at least up to the adjacent areas of Swat, Hazara and Kashmir. In marked contrast, more drought-resistant species of an informal (Inner) West-Himalayan element seem to be well represented on Nanga Parbat. Many species like *Cedrus deodara*, *Taxus wallichiana*, *Quercus baloot* and *Podophyllum hexandrum* are on the very NW limit of their distribution areas at Nanga Parbat, reflecting the intermediate semi-arid to semi-humid position of the mountain massif.

2. Euro-Siberian or Eurasiatic temperate elements are particularly well represented in the flora of Nanga Parbat and concentrated in the montane belt. Small exclaves of their distribution areas, contiguous to Gilgit, Nanga Parbat and Kashmir are usually widely separated from the main areas of their distribution in N Asia (Serawshan or Tian Shan, Altai northwards). The disjunct W Himalayan populations seem to be relicts with only the slightest traces of speciation processes. Long-distance dispersal does not seem to explain sufficiently the number of Eurasiatic species in the Nanga Parbat region. Nanga Parbat thus probably forms an important "bridgehead" for the migration of Euro-Siberian species into the Himalayas and vice versa; this in turn would call for periods of generally moister conditions than those prevailing at present. It may be assumed that pleistocene humidity conditions were sufficient for a near continuous humid-temperate belt along the W rim of High Asia.

3. Although species of a wide "High Asian" distribution (Tian Shan, Pamir, Karakorum, Himalaya, Tibet) are well represented in the alpine flora of Nanga Parbat, there are few Tibetan elements. Phytogeographically, the Nanga Parbat massif itself (including the Deosai Plains to the E, despite the general physiognomic character) seems to be fairly isolated from the Tibetan Plateau. Taking into consideration the poor representation of endemics, this might be further evidence for Nanga Parbat having undergone comparatively recent, probably dramatic climatic changes. We incline towards the theory of an isolated glaciation, which may however have almost completely covered the massif, rather than of an ice-sheet contiguous to the (disputed one) of the Tibetan plateau.

4. There seems to be a partial deficiency of characteristic Central Asiatic genera (*Artemisia*, *Tanacetum*, *Oxytropis*, *Stipa*) and species in the flora of Nanga Parbat, possibly not fully explained by its climatic gradient towards the Karakorum. Some more evidence hints at certain

distribution types being intimately linked to plate tectonic properties. Central Asiatic elements are well represented in the adjacent parts of the Kohistan and Ladakh terranes (island arcs) to the W and E of Nanga Parbat. In a few instances, closely interrelated and otherwise isolated species pairs are confined to the Himalaya S slope and parts of the Kohistan and Ladakh terranes respectively, but excluding the main Himalayan axis with the Nanga Parbat massif (*Carex kashmirensis* – *C. oligocarya*, Dickoré (1995), almost identical pattern: *Tanacetum roylei* – *T. stoliczkae*). The genus *Pseudomertensia*, on the other hand, seems to be endemic to the area surrounding the collision zone of the Indian and Eurasian plates, including the area of the island arcs. There are probably more paleogeographically interesting distribution types, which however are often obscured by taxonomic difficulties.

5. The obvious discontinuity in the altitudinal distribution of plant species on Nanga Parbat at c. 2300 m is apparently a regular feature, resembling similar phenomena in the Batura Glacier area (3100 m, unpublished) and K2-North (4400 m, Dickoré 1991). Drawing a physical correlation of this discontinuity of diversity with thermo-hygic gradients along the well-known dry interior valleys of the Inner Himalayas (Wissmann 1960-61) would be a challenging task, though it does not seem to parallel the floristic or vegetational altitudinal belts. This effect may furthermore be related to relief features, since the surface area at approximately this altitude around Nanga Parbat is limited to a minimum by fluvio-glacial relief processes.

We must desist from general speculations on population dynamics in individual species. Due to the relatively short period that has passed since the first botanical explorations, because of the still generally insufficient exploration, as well as of prevailing taxonomic problems, it is impossible to evaluate actual frequencies. Except for the (economically) most important forest trees, the question as to whether or not species (populations or numbers) are declining owing to human activity and actual climatic trends cannot be resolved. The time of introduction of alien species also remains obscure.

Regardless of the provisional character of the present Flora, the authors hope to have contributed to the understanding of the natural history of one of the finest massifs of the Great Himalayas. Nanga Parbat is not just a splendid mountain, but an integral part of the livelihood strategies and welfare of the local communities and the people of Pakistan as well as a prominent symbol of the natural and cultural heritage of mankind. All possible encouragement and support should be given to a wise management and sustainable utilisation of its natural resources.

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