

The Late Dr H. B. Singh
(1916-1974)

WILD EDIBLE PLANTS OF INDIA

H. B. SINGH AND R. K. ARORA
National Bureau of Plant Genetic Resources
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Dr HARBHAJAN SINGH

(1916-1974)

Dr Harbhajan Singh was born at Pusa (Bihar) on February 6, 1916. After obtaining the degree of Master of Science in Botany from Agra University in 1938, he joined the Indian (then Imperial) Agricultural Research Institute for a two-year Diploma course of Associateship in Economic Botany. Thereafter, he was taken up on the research staff of the Division of Botany where he pursued his scientific career with immense zeal and devotion, and rose to the position of the Head of the Division of Plant Introduction in that Institute.

Dr Singh was among the first to realise the immense possibilities of crop improvement in India through systematic plant introduction and exploration. He was a plant explorer of eminence with regard to cultivated plants and their wild relatives, and carried out one-man trips, as well as led teams of agricultural plant explorers to different parts of India and the neighbouring countries such as Nepal. These explorations led to the collection of wild germplasm comprising primitive and obsolete cultivars of many crop plants as well as their wild relatives. These also led to the addition of a new species, *Abelmoschus tuberculatus*, and a new record, *Hierochloa odorata* to the Indian flora, and to our knowledge on the domestication and usage of certain less known economic plants like *Moghania vestita* and *Digitaria cruciata* var. *esculenta*.

Dr Singh was an outstanding agricultural botanist and his contributions in the field of improvement of vegetable and horticultural crops and plant introduction are of national importance. He made significant contribution in selection, evolution and release of new varieties of various vegetable crops such as peas, tomatoes, cauliflower, *bhindi*, turnip, carrot, Frenchbean, *guar*, bottle-gourd, cowpeas, *luffa*, onion, sweet potato, cucumber, watermelon, and garden beet. A number of these varieties are being currently grown all over India. *Okra (bhindi)* cv. Pusa Sawani evolved by him made a history in vegetable growing in India. His discovery of primitive cultivars of *bhindi* resistant to jassid and yellow-vein mosaic virus is being used for the development of hardy and better varieties of this crop.

He also selected varieties of oats suitable for breakfast food industry and for green forage. He was one of the earliest plant breeders to realise the importance of soybean crop in this country. His contributions also included horticultural crops such as low chilling varieties of temperate fruits like peach and apple, *ber* (jujube), West Indian cherry, Chinese gooseberry, and a wide range of ornamentals such as small-flowered (pompon) varieties of *Chrysanthemum*.

Several institutions, like the National Seeds Corporation, the Indian Standards Institution, the Indian Council of Agricultural Research, the Council of Scientific and Industrial Research, the Botanical Survey of India and many others, often utilised his services in an advisory capacity. He was deputed as the leader of the Indian delegation of plant breeders and geneticists to the USSR in 1971 and, in the following year, he went to the USA to represent India at the Third Meeting of the Ad Hoc Working Group on International Agricultural Research, held at Beltsville, on the collection, conservation and evaluation of plant genetic resources.

Dr Singh had more than one hundred publications to his credit consisting of original research papers, monographs, bulletins, and popular articles. He was a fellow of a number of learned societies, as for example, the Horticultural Society of India, Indian Society of Genetics and Plant Breeding, International Society for Horticultural Sciences, and the Society for Advancement of Breeding Researches in Asia and Oceania (SABRAO). As a member of the Faculty of the Post-Graduate School of the Indian Agricultural Research Institute, he taught Economic Botany and Taxonomy of Higher Plants and guided many research scholars working for the M.Sc. and Ph.D. degrees of the Institute.

In 1971, the President of India conferred on him the Padma Shri award for his meritorious contributions. In the same year, the Punjab Agricultural University bestowed on him the degree of Doctor of Science (*Honoris Causa*).

Dr. Singh passed away on January 15, 1974.

PREFACE

WILD plants have been consumed as food since pre-historic times. They constitute even today an important part of the food of tribal people. Man can depend on these wild edible plants during famine and similar scarcity conditions. Considering their importance and non-availability of any published account on the subject, an effort was made to compile all available information on wild edible plants in India.

A few years earlier, some information on the subject was collected by Shri P. P. Khanna of the Division of Plant Introduction, IARI, a part of which has been made use of here. For a fuller treatment of the subject, all available published literature was screened leading to the present compilation which deals with 600 wild edible plants. Field notes gathered during explorations conducted in different parts of the country have been utilized and the existing information on many wild edible types supplemented in this publication.

The enumerated data on various edible plants have been arranged into several categories based on plant-part eaten, the underground parts, the leaves and shoots, flowers, fruits and seeds, the plants in each category having been listed alphabetically according to their botanical names. English and Hindi names in most cases have been given. For each plant, broad distributional range has been indicated and care has been taken to provide all the available information on their usage, and the various ways in which each plant is consumed. Besides, floristic and ethnobotanical information on the occurrence and usage of these edible types along with some data on their nutritive values has been provided in the Introduction.

Shri M. W. Hardas, Senior Plant Introduction Officer, went through the introductory chapter and proposed suitable modifications in the text. We express our deep gratitude to him for the help. We are also grateful to Shri P. P. Khanna for his valuable assistance in the compilation of this publication. We are equally thankful to our other colleagues who have helped us in various ways in the accomplishment of this task.

The photographs illustrating the bulletin were taken almost entirely by us. It has been possible to include only a limited number therefrom representing various groups. Our thanks are also due to Shri G. Srivastava for sorting out these from the large collection maintained by him in the Plant Introduction Division.

New Delhi
December, 1973

H. B. SINGH
R. K. ARORA

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1. INTRODUCTION

THE identification of plants useful to man from among natural stands, commenced in pre-historic times. Several of these plants catering to basic human needs, such as food, clothing, shelter, transport, etc., were domesticated. In course of time, the cultivation of many of these plants spread over from the centres of their domestication to newer areas through advances in plant acclimatisation and breeding. Thus we see today large-scale cultivation of a variety of food and other crops on a global basis. The cultivated plants have expanded at the cost of wild plants and today the two constitute a mosaic pattern on the land surface of the earth.

The primitive man, through a process of trial and error, screened in his own way the wild-growing plants that gave edible plant parts and domesticated most of them. The modern man has neither domesticated the left-over nor has identified any new food plants in recent times, which could be widely acceptable. The wild edible plants are particularly useful during famine and under similar scarcity conditions. Even during normal times, they provide articles of diet to the tribal population who generally inhabit the hilly and other less accessible areas in both the developed and developing countries.

A few world compilations on useful plants (Uphof, 1968; Clute, 1943) and other regional works of this kind (Burkill, 1935 for Malaya; Povlov, 1942 for USSR; Edlin, 1951 for the U.K., Dalzell, 1937 for Tropical West Africa; and Saunders, 1934 for the USA and Canada) list such wild edible types. Besides, many compilations on countrywise basis exclusively for wild edible plants have also been published (Cameron, 1917 and Hill, 1939 for the U.K.; Medsger, 1943; Fernald and Kensy, 1943; Porsild, 1937; Harrington and Matsumura, 1967, for the USA and Canada; Kolesnikov, 1943 for the USSR; Porterfield, 1951 and Cheng, 1965 for China; Wester, 1925 and Brown, 1951-54 for Philippines; and Barrau, 1959 for South Pacific Islands). This presentation is a similar compilation for India.

In India, approximately 7 per cent of the population constitutes the tribal people, and the Community Development Department of the Government of India has identified over 425 tribal development blocks. Food deficiency usually prevails in these under-developed tribal areas and products from some of the wild plants are even consumed as staple or principal foods, as for example, jack fruit (*Artocarpus heterophyllus*) and mahua (*Madhuca indica*) flowers in most parts of peninsular India especially during summer and monsoon before harvesting of the *kharif* crop. A variety of such products are also brought by the tribals for sale in the local markets for consumption by urban population, as for example, the fruits of *Elaeocarpus floribundus*, *Docynia indica*, *Prunus jenkinsii* in north-eastern region,

Rhodomyrtus parviflora in Nilgiris, *Myrica nagi*, *Rubus ellipticus* and *R. lasiocarpus* in the Himalayas, *Grewia populifolia*, *Zizyphus*, *Cordia*, *Rhus* and *Salvadora* species in the drier tracts, and the tubers/rhizomes of *Dioscorea*, *Colocasia*, *Nymphaea*, leaves of *Colocasia*, *Nymphaea*, *Ipomoea aquatica*, flower-buds of *Bauhinia* and the kernels of *Buchanania lanzan* (*chironji*) in most parts of peninsular India. Thus various plant parts are consumed as food—the tuberous starchy roots or rhizomes, leafy herbs or leaves, flowers or flower-buds, fruits and the seeds, nuts or kernels. All these are consumed chiefly as direct food sources and eaten as foods to appease hunger. Occasionally, some amongst these are also used as indirect foodstuffs—as favourable additions to dishes in curries etc., mainly as spices and condiments like the seeds of *Alpinia galanga*, leaves of *Murraya koenigii* and the rhizomes of *Zingiber* species.

Of the total floristic wealth of about 20,000 species of Angiosperms available in India, about 600 fall in the above categories for use directly or indirectly as food-stuffs. Many articles of local interest have appeared since the first comprehensive publication dealing with this aspect as also on other economic plants (Watt, 1971) but the main source of further information lies scattered in the various regional floristic works (Duthie, 1960; Cooke, 1958; Gamble, 1957; Kanjilal *et al* 1934-40; Prain, 1963; Haines, 1961; Santapau, 1958 and Collett, 1971) which deal with the flora of India. Though attempts to synthesize information on economic plants of India have been made recently (Sundararaj and Balasubramanyam, 1959; Maheshwari and Singh, 1965), no comprehensive account dealing exclusively with the edible wild plants exists at present. It is hoped this synthesis will serve well as a handy piece of information on the subject, and will create more inquisitiveness in the botanists interested in ethnobotanical studies. Besides using all the information given in the above cited literature and in the *Wealth of India*, additional notes, wherever possible, from our own experience are also appended.

In the synthesis presented in the following pages, the edible wild kinds have been classified into a few broad categories based on the plant-parts eaten, e.g. the roots/tubers, leaves and shoots, flowers, ripe and unripe fruits, and the seeds, nuts and kernels. In each category, the plants are listed alphabetically according to their botanical name, generally followed by the English and Hindi names, the latter given in italics. This is followed by the family name given in parenthesis. For each plant, habit and broad geographical distribution are given followed by its usage as food. Of the plants listed in each category, the widely used and more important types are marked with an asterisk.

2. PLANTS WITH EDIBLE UNDERGROUND PARTS

THE underground parts of many wild plants form an important source of starchy food consumed by the tribal inhabitants living nearer to the forest tracts where such edible kinds occur. Botanically, these esculent types numbering over 70, belong to widely different families of which Dioscoreaceae and Araceae supplying wild edible yams and taros are more important because of the hugeness of their tubers and of their wider occurrence and availability particularly in the humid tropical-subtropical tracts. As compared with these, plants of groups like Cyperaceae (*Cyperus* spp.), Asclepiadaceae (*Ceropegia* spp.), and Papilionaceae (*Vigna* and *Moghania* spp.) possess much smaller tubers. Different from these starchy types are the rhizomes of some Zingiberaceae which are usually hard, and fibrous and of the aquatic types like Nymphaeaceae and Alismaceae which though fibrous, are often porous and pithy. All these kinds are however eaten.

Though widely distributed in different regions of the country, much varied types in these starchy foods occur particularly in the humid parts of western ghats, eastern ghats and the north-eastern India. The wild edible types in genera like *Dioscorea*, *Alocasia*, *Colocasia*, *Vigna*, *Moghania*, *Ceropegia*, *Alpinia*, *Curcuma*, *Zingiber* and others occur here in abundance. While most of these occur widely, *Ceropegia* types are mainly found in the western ghats of Maharashtra and further southwards. As compared to these tropical types, a restricted variety is available in the temperate belt. Species of genera like *Codonopsis*, *Polygonatum*, *Anglica*, *Bunium* and a few more are met with chiefly in the alpine habitat while in the lower Himalayan ranges types of some of the tropical, sub-tropical genera e.g., *Dioscorea*, *Vigna* and *Moghania* occur widely.

These starchy and fibrous underground parts are eaten or otherwise consumed in various ways. The tubers of *Vigna capensis*, *Moghania tuberosa*, *M. vestita*, *Eriosema chinense* and *Peucedanum dhana* var. *dalzellii* are eaten raw; though more often boiling and cooking these as vegetable, particularly the tubers of *Dioscorea*, *Colocasia* and *Alocasia* spp. is largely practised, because of the presence of calcium oxalate crystals in these tuberous forms. Boiling removes acidity and renders the tubers edible as a vegetable. Occasionally, the tubers of some types are also pickled e.g., of *Decalepis*, *Coleus* and *Curcuma*, or candied, e.g., of *Asparagus racemosus* var. *javanicus*. Sometimes these are also made into preserves as the rhizomes of *Costus speciosus*. Another use to which some of these forms are put is as condiments. The thick underground rhizomatous stocks of *Curcuma*, *Alpinia* and *Zingiber* species are consumed in this way.

Processing of dry tubers to extract starchy content in which these forms are rich, is also carried on. Thus edible flour is sometimes

prepared from the starchy tubers of *Codonopsis ovata* in the Himalayas, the tubers of *Dioscorea hispida* are also processed similarly, while those of *Hilchenia caulina* yield starch used as a substitute for arrowroot. In *Cyperus bulbosus* the dried tubers are pounded into flour and baked into bread or even cooked as pudding.

Another category is of the less starchy types which are also consumed as vegetables. More prominent among these are the rhizomes of *Limnanthemum*, *Sagittaria* and *Nelumbo* spp., which are eaten cooked, the last one being a favourite particularly of the north India people. Apart from being eaten raw or cooked as vegetable, occasionally the tubers of some esculent types like *Cyperus esculentus* are ground to powder and used as a substitute for coffee or cocoa.

The food values (chemical composition) of some of the edible wild tuberous types are given in Table 1, indicating that these are fairly rich in carbohydrates, and proteins. The tubers of *Vigna capensis* have been found to be rich in phosphorus and calcium.

Plants under this group are described below.

Underground Parts—tubers, rhizomes, etc.

- Abelmoschus crinitus* Wall. Syn. *Hibiscus crinitus* G. Don (Malvaceae). A bristly herb found in sub-Himalayan tract, Kashmir eastwards. The tuberous fusiform roots are edible.
- Allium rubellum* Bieb. *Jangli piaz* (Liliaceae). A herb found in north-western Himalayas. In Lahul, its roots are eaten raw or cooked.
- A. (sphaerocephalum)* Linn. (Liliaceae). A herb of north-western Himalayas. Its roots are eaten in Lahul.
- Alocasia macrorrhiza* Schott. Giant taro, *Baromankachu* (Araceae). A tall herb found wild in hilly tracts of eastern, north-eastern India, where it is also cultivated. The starchy rhizome/tubers are eaten after boiling.
- Alpinia galanga* (L.) Willd. Greater galangal, *kulinjan* (Zingiberaceae). A perennial herb found in humid tropical areas of eastern and western peninsula, northwards in sub-Himalayan region. The orange-brown aromatic rhizomes though pungent are used as condiment.
- A. speciosa* K. Schum. Syn. *A. nutans* Rosc. (Zingiberaceae). A tall herb found in north-eastern hilly tract and in eastern Himalayas. The rhizomes are used as a substitute for ginger.
- Amorphophallus campanulatus* Bl. *zimikand*, *suran* (Araceae). A stout herb found wild in humid parts of western and eastern India. The underground corms after washing and prolonged cooking are used for vegetable. It is also cultivated commonly.
- Angelica glauca* Edgew. *chora* (Umbelliferae). A herb of western Himalayas. Its aromatic roots are added to food to give it celery-like flavour.

- Aponogeton crispum* Thumb. (Aponogetonaceae). An aquatic herb found in tropical, mainly peninsular tract. The starchy rhizomes are eaten.
- **A. monostachyon* Linn. Syn. *A. natans* (L.) Engl. & Krause, *ghechu* (Aponogetonaceae). A herb found in ponds like *A. crispum*. The starchy rhizomes are edible and said to be as good as the potatoes.
- Arisaema speciosum* Mart. *Kiralu* (Araceae). A herb found in the Himalayas, Kashmir eastwards. The corms of this and also of *A. concinnum* are eaten only after repeated boiling.
- Asparagus adscendens* Roxb. *safed musli* (Liliaceae). A prickly suberect plant found chiefly in sub-Himalayan tract. The whitish tuberous roots are pickled.
- A. racemosus* Willd. *Satavari* (Liliaceae). A prickly climber found in tropical and sub-tropical India. The white tuberous roots are often candied.
- Bunium persicum* (Boiss.) Fedls. Syn. *Carum bullbocastanum* Clarke non Koch; Black Caraway, *kalazira* (Umbelliferae). A herb found in western Himalayas in a cold desert climate especially of Lahaul. The starchy tubers are edible.
- Bupleurum falcatum* Linn. var. *marginata* Wall. *Kalizewar* (Umbelliferae). A herb found in the Kaslunir Himalayas eastwards to Khasi hills. The roots are edible.
- **Ceropegia bulbosa* Roxb. *Khapparkadu* (Asclepiadaceae). A climber found in the hilly tracts of central India and in western ghats. The tuberous roots are edible only after boiling in water.
- C. hirsuta* Wt. & Arn. *khantali* (Asclepiadaceae). A climber found in the humid tracts of western and eastern ghats. The tubers are eaten.
- **C. lawii* Hook. *Kharpudi* (Asclepiadaceae). A herbaceous climber occurring chiefly in western ghats. The tubers after boiling are eaten like potato.
- C. oculata* Hook. *Patala* (Asclepiadaceae). A climber found mainly in the western ghats. The tubers are edible and eaten like potato.
- C. pusilla* Wt. and Arn. (Asclepiadaceae). A herbaceous twiner found in higher hills of south India, mainly Nilgiris. The tubers are edible.
- C. tuberosa* Roxb. *Patala-tumbi* (Asclepiadaceae). A herbaceous twinter found in southern parts of the peninsula. The tubers are edible.
- Chlorophytum tuberosum* Baker, *kulai* (Liliaceae). A herb found in the peninsular region, extending southwards. The swollen roots are edible.
- **Codonopsis ovata* Benth. *Luduti* (Compositae). A herb found in temperate Himalayas—Kashmir eastwards to Garhwal. From the large fusiform roots flour is prepared and eaten in Lahul.
- **Coleus forskohlii* (Poir.) Briq. Syn. *C. barbatus* Benth. (Labiatae). An aromatic herb found in the sub-Himalayan tract and in the western ghats. The thick tuberous root-stock is eaten.
- **Colocasia esculenta* (L.) Schott. Syn. *C. antiquorum* Schott, taro, dasheen, *kachu*, *arvi*, *kachalu* (Araceae). A tall tuberous plant found in humid

tracts particularly common in north-eastern India where both wild and cultivated types occur. The underground farinaceous tubers or corms, elongated to roundish in shape, are consumed after boiling. They are also eaten fried.

- Costus speciosus* (Koenig Sm. *Kenkemuka* (Zingiberaceae). A tall herb found in the humid tropical-subtropical tracts, extending to sub-Himalayan region. The rhizome is edible.
- Curcuma amada* Roxb. Mango ginger, *aam haldi* (Zingiberaceae). A herb found wild in parts of West Bengal, Konkan and Tamilnadu chiefly in humid tracts. The rhizomes are used as condiments. It is also cultivated.
- C. angustifolia* Roxb. East Indian arrowroot, Travancore starch, *tikhur* (Zingiberaceae). A herb occurring in central India, West Bengal, western ghats and in the sub-Himalayan tract Kumaon eastwards. The starchy rhizomes are used as a substitute for the true arrowroot powder; the sun-dried tubers are ground into flour.
- C. leucorhiza* Roxb. *Tikar* (Zingiberaceae). A herb found in eastern India, in Bihar and West Bengal. The rhizomes are utilized for starch preparation.
- C. montana* Rosc. (Zingiberaceae). A herb found mainly in the humid parts of the western ghats. The starchy rhizomes are edible.
- C. rubescens* Roxb. (Zingiberaceae). A herb found in Bihar and West Bengal. The rhizomes are utilized as a source of starch.
- C. zedoaria* Rosc. *Zedoary*, *kashuru* (Zingiberaceae). A herb found wild in the eastern Himalayas and in western ghats. The large fleshy rhizomes are rich in starch and are used as a substitute for arrowroot. It is also cultivated.
- **Cyperus bulbosus* Vahl, *motha* (Cyperaceae). A sedge found widely in peninsular region. The small tubers are eaten roasted or dried and pounded into flour. They can be baked into a bread or cooked as pudding.
- C. esculentus* Linn. Tiger nut, *chufa*, *chichoda* (Cyperaceae). A perennial sedge found in northern hills and Nilgiris and other higher hills of western ghats. The tubers are eaten cooked as vegetable or roasted and eaten.
- **Decalepis hamiltonii* Wt. and Arn. (Asclepiadaceae). A climbing shrub found mainly in western peninsula and Andhra Pradesh. The aromatic roots are used as spices and condiments. They are also pickled with lime or as such.
- **Dioscorea belophylla* Voight. Syn. *D. glabra* Roxb. (Dioscoreaceae). A climber found in the humid tropical-subtropical tracts, extending to the Himalayas, also found in Nicobar and Andaman Islands. The earth-skinned tubers with white flesh, usually buried deep in the ground are uprooted and eaten.

- **D. bulbifera* L. Potato yam, *ratalu* (Dioscoreaceae). A prickly climber found in the humid tropical-subtropical tracts, extending to the Himalayas. The dull brownish tubers with yellowish flesh are edible.
- **D. hamiltonii* Hook f. (Dioscoreaceae). A climber found in the humid tropical tracts all over India. The large deeply buried tubers are delicious to eat. It is the most esteemed of wild yams in Kerala.
- **D. hispida* Dennst. Syn. *D. daemonia* Roxb. *karukandu* (Dioscoreaceae). A climber found in the humid parts of western and eastern India, and in the sub-Himalayan region. The depressed globose, lobed tubers which are usually borne close to the soil surface yield edible flour after processing.
- D. oppositifolia* Linn. *Kanta-alu* (Dioscoreaceae). A climber found in the western ghats and other humid tropical-subtropical tracts. The red-skinned deep seated tubers are with soft white flesh and are eaten.
- D. pentaphylla* Linn. *Bhura, kanta-alu* (Dioscoreaceae). A climber found all over India except in the drier areas. The brownish-skinned tubers are eaten after boiling.
- D. puber* Bl. Syn. *D. anguina* Roxb. *Kasa-alu* (Dioscoreaceae). A climber found in the humid parts of western and eastern India and in the sub-Himalayan tract. The tubers are consumed after boiling.
- D. quinata* Wall. (Dioscoreaceae). A climber found in the north-western Himalayas. The whitish tubers are eaten.
- D. sagitata* Royle (Dioscoreaceae). A climber found in the north-western Himalayas. The tubers are eaten.
- D. versicolor* Wall. (Dioscoreaceae). A climber found in the eastern peninsular region. The underground tubers as well as the aerial bulbs are eaten.
- Dracocephalum heterophyllum* Benth. (Labiatae). A herb of western Himalayas. The roots are reported to be used as a vegetable.
- Eleocharis dulcis* Trin. Syn. *E. plantaginea* R. Br. (Cyperaceae). A sedge met within tropical-subtropical tracts except in the drier areas. The dark brown, round to onion-shaped starchy tubers are eaten.
- **Eriosema chinense* Vog. *kondan* (Papilionaceae). A herb or an under-shrub found in the humid tropical-subtropical tracts; also in the sub-Himalayan region, Kumaon eastwards. The tubers are eaten raw. (Fig. 3).
- Eulophia campestris* Lindl. (Orchidaceae). The tubers of this east Himalayan orchid are eaten.
- Gastrochilus pandurata* Ridley (Zingiberaceae). A perennial herb found in Konkan and in the Andaman Islands. The rhizomes are used as a spice/condiment.
- **Hitchenia caulina* Baker, Indian arrowroot, *tikhur* (Zingiberaceae). A under-shrub found in the western ghats in Maharashtra (Mahableshwar

tracts particularly common in north-eastern India where both wild and cultivated types occur. The underground farinaceous tubers or corms, elongated to roundish in shape, are consumed after boiling. They are also eaten fried.

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C. rubescens Roxb. (Zingiberaceae). A herb found in Bihar and West Bengal. The rhizomes are utilized as a source of starch.

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- **D. hispida* Dennst. Syn. *D. daemona* Roxb. *karukandu* (Dioscoreaceae). A climber found in the humid parts of western and eastern India, and in the sub-Himalayan region. The depressed globose, lobed tubers which are usually borne close to the soil surface yield edible flour after processing.
- D. oppositifolia* Linn. *Kanta-alu* (Dioscoreaceae). A climber found in the western ghats and other humid tropical-subtropical tracts. The red-skinned deep seated tubers are with soft white flesh and are eaten.
- D. pentaphylla* Linn. *Blura*, *kanta-alu* (Dioscoreaceae). A climber found all over India except in the drier areas. The brownish-skinned tubers are eaten after boiling.
- D. puber* Bl. Syn. *D. anguina* Roxb. *Kasa-alu* (Dioscoreaceae). A climber found in the humid parts of western and eastern India and in the sub-Himalayan tract. The tubers are consumed after boiling.
- D. quinata* Wall. (Dioscoreaceae). A climber found in the north-western Himalayas. The whitish tubers are eaten.
- D. sagitata* Royle (Dioscoreaceae). A climber found in the north-western Himalayas. The tubers are eaten.
- D. versicolor* Wall. (Dioscoreaceae). A climber found in the eastern peninsular region. The underground tubers as well as the aerial bulbs are eaten.
- Dracocephalum heterophyllum* Benth. (Labiatae). A herb of western Himalayas. The roots are reported to be used as a vegetable.
- Eleocharis dulcis* Trin. Syn. *E. plantaginea* R. Br. (Cyperaceae). A sedge met within tropical-subtropical tracts except in the drier areas. The dark brown, round to onion-shaped starchy tubers are eaten.
- **Eriosema chinense* Vog. *kondan* (Papilionaceae). A herb or an under-shrub found in the humid tropical-subtropical tracts; also in the sub-Himalayan region, Kumaon eastwards. The tubers are eaten raw. (Fig. 3).
- Eulophia campestris* Lindl. (Orchidaceae). The tubers of this east Himalayan orchid are eaten.
- Gastrochilus pandurata* Ridley (Zingiberaceae). A perennial herb found in Konkan and in the Andaman Islands. The rhizomes are used as a spice/condiment.
- **Hitchenia caulina* Baker, Indian arrowroot, *tikhur* (Zingiberaceae). A under-shrub found in the western ghats in Maharashtra (Mahabaleshwar

- hills). The starchy tubers are edible; rich in starch and are a source of arrowroot.
- Houttuynia cordata* Thunb. (Saururaceae). A perennial herb found in the north-eastern hills and in sub-Himalayan region. The rhizomes are eaten raw or cooked as a vegetable.
- Lasia spinosa* (L.) Thw. Syn. *L. macrophylla* Schott. (Araceae). A prickly herb found in West Bengal and north-eastern hills, also in sub-Himalayan region. The roots are eaten as a vegetable in curries.
- Moghania tuberosa* (Dalz.) O. Kuntze (Papilionaceae). A perennial spreading herb found in western ghats, mainly along Maharashtra coast. The fusiform roots are eaten raw.
- **M. vestita* O. Kuntze Syn. *Flemingia vestita* Benth. ex Baker (Papilionaceae). A spreading herb found in western Himalayas, eastwards to Khasi hills. The fusiform roots are eaten raw. (Fig. 4).
- **Nelumbo nucifera* Gaertn. Syn. *Nelumbium speciosum* Willd. Indian lotus, *kamal*, *kanwal* (Nymphaeaceae). An aquatic herb found throughout India in warmer parts, more common in eastern India. The rhizomes are consumed as a vegetable.
- Nymphoides indicum* (Roxb.) O. Kuntze Syn. *Linmanthemum indicum* (L.) Thw. *Bara chulai* (Gentianaceae). An aquatic herb found in ponds all over warmer parts of India. The thick rhizomes are used as a vegetable.
- Oxalis martiana* Zucc. (Oxalidaceae). A creeping herb found in the Himalayas, north-eastern hills and in Nilgiris. The tubers are eaten.
- Pentstemon spiralis* (Forsk.) Decne Syn. *P. cynanchoides* R. Br. (Asclepiadaceae). A shrub mainly of drier north-western region. The tubers are sweet and eaten.
- Peucedanum dhana* Buch-Ham. ex C. B. Clarke var. *dalzellii* C. B. Clarke (Umbelliferae). A perennial herb found in the humid tracts of Maharashtra, also in Bihar, Orissa and in Andhra Pradesh. The swollen roots tasting like carrots are eaten raw.
- Polygonatum multiflorum* All. Solomon's Seal (Liliaceae). A tall perennial herb found in the western Himalayas, Kashmir eastwards to Manipur. The mucilaginous, sweet rhizomes when macerated in water yield edible starch.
- P. verticillatum* All. *Mithadudia* (Liliaceae). A perennial herb found in the Himalayas, Kashmir eastwards to Manipur. The rhizomes are eaten; valued as *salap*—a strength-giving food.
- Polygonum bistorta* Linn. Syn. *P. paleaceum* Wall. ex Hk.f. Bistort, snakeroot (Polygonaceae). A perennial herb found in the Himalayas, Kashmir eastwards to north-eastern hills. The tuberous rootstock is eaten.
- P. glabrum* Willd. (Polygonaceae). A herb widely distributed in plains and hills except in dry arid tracts. The roots are eaten.

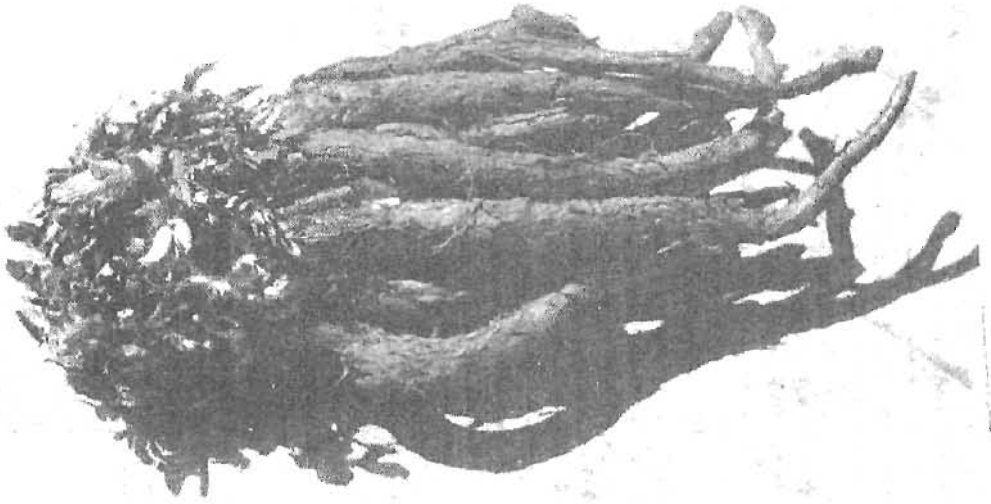


Fig. 1. *Potentilla moaniana*—roots

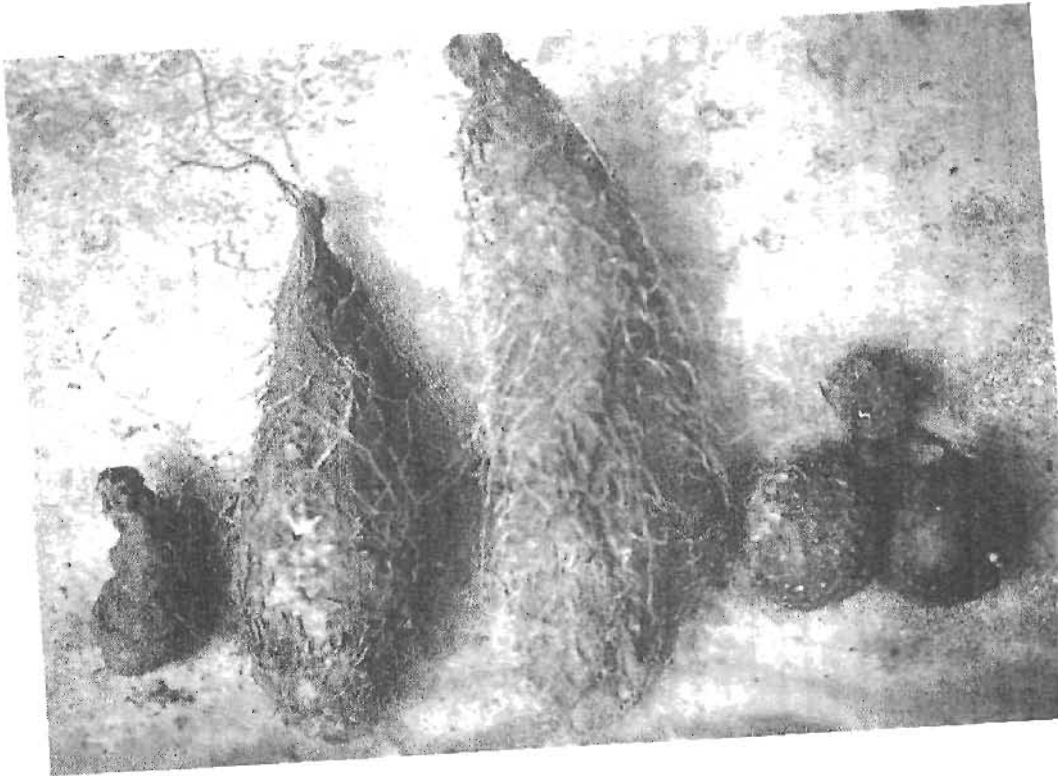


Fig. 2. *Dioscorea* species—tubers

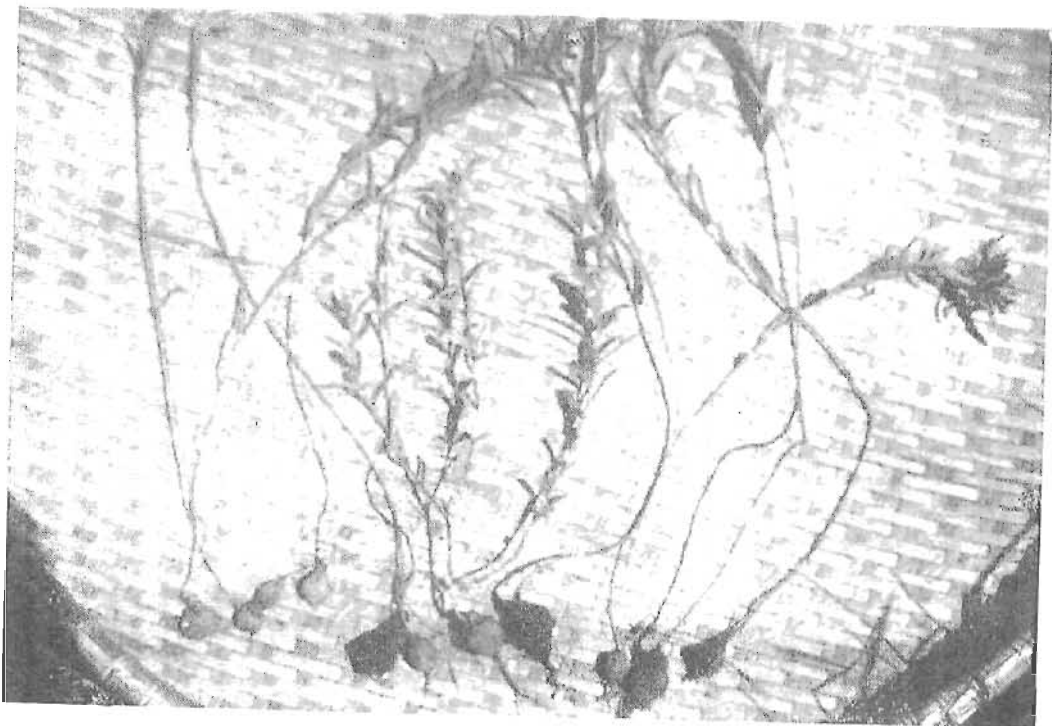


Fig. 3. *Eriosema chinense* — plants with tuberos roots

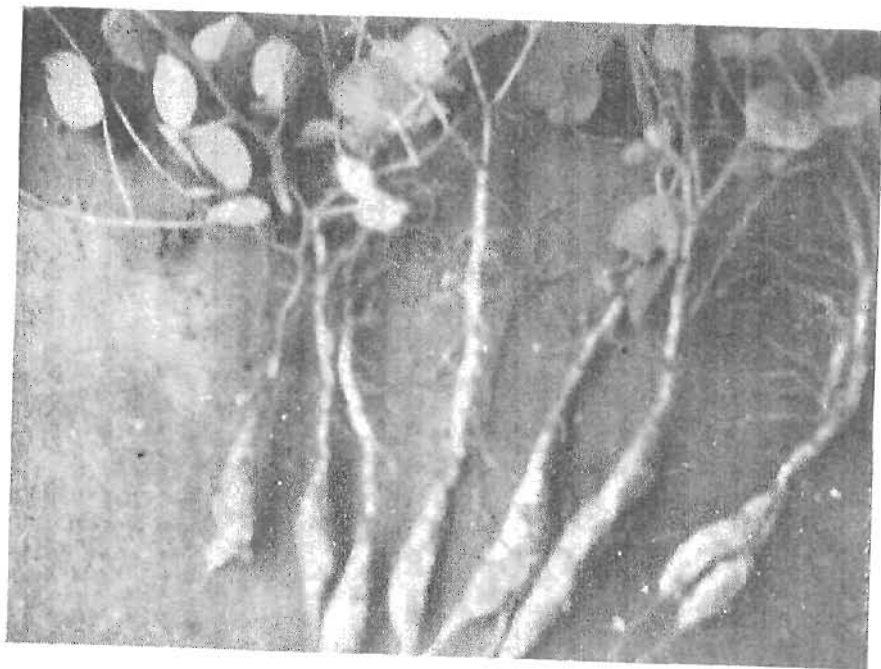


Fig. 4. *Mughania vestita* — tuberos roots

- **Pueraria tuberosa* DC. Indian kudzu, *sural*, *bilaikhund* (Papilionaceae). A huge climber occurring in the hilly, sub-hilly tracts all over India except in drier areas. The large tuberous roots tasting like liquorice are eaten raw or boiled.
- **Sagittaria sagittifolia* Linn. *Chotakut* (Alismaceae). An aquatic herb found throughout India. The tuberous rhizomes are eaten as a vegetable.
- **Scirpus kysoor* Roxb. *Kachar* (Cyperaceae). A sedge found throughout India. The tubers are sliced and eaten. They are sweet, starchy and nutritious.
- Tacca leontopetaloides* (L.) O. Kuntze Syn. *T. pinnatifida* Forst. East Indian arrowroot, *diva* (Taccaceae). A perennial herb found wild in humid hilly tracts of western, central and eastern India. The rhizomes are eaten. It is also cultivated.
- Tulipa stellata* Hk. (Liliaceae). A herb found chiefly in the western Himalayas. The bulbs are edible.
- **Vigna capensis* Walp. Syn. *V. vexillata* A. Rich. *halunda* (Papilionaceae). A perennial climber found in the hilly-sub-hilly tracts of peninsular India, extending to the sub-Himalayan region. The globose fusiform roots are eaten raw or boiled and constitute a major food of the hill tribes. (Fig. 5).
- Vitis lanata* Roxb. (Vitaceae). A climber occurring in the Himalayan and in peninsular hilly tracts. The roots are eaten.
- Zingiber cassumunar* Roxb. *Jangli-adrak* (Zingiberaceae). A perennial herb found in humid parts of India. The rhizomes are used as condiments.
- Z. zerumbet* Rosc. ex Smith, *kachur* (Zingiberaceae). A perennial herb found in humid tropical-subtropical tracts—both in wild and cultivated state. The thick rhizomes are used as condiments.

Consumed as scarcity or famine food

- Amorphophallus commutatus* Engl. Syn. *A. sylvaticus* Dalz. and Gibs. (Araceae).
- Arisaema concinnum* Schott (Araceae).
- Asparagus sarmentosus* Hort. (Liliaceae).
- Asphodelus tenuifolius* Cav. (Liliaceae).
- Borassus flabellifer* Linn. Palmyra palm, *tar* (Palmeae).
- Butea monosperma* (Lamk.) Taub. Syn. *B. frondosa* Koenig ex Roxb. Flame of the Forest, *dhak*, *palas* (Papilionaceae).
- Crinum defixum* Ker-Gawl Syn. *C. asiaticum* Roxb. *pindar*, *sukhadershan* (Amaryllidaceae).
- Cyperus rotundus* Linn. Nutgrass, *motha* (Cyperaceae).
- Dioscorea* spp., (Dioscoreaceae). (Fig. 2).
- Hedychium coronarium* Koenig (Zingiberaceae).
- Kaempferia scaposa* Benth. Syn. *Hedychium scaposum* Nimmo ex. Grah. (Zingiberaceae).

- Melothria heterophylla* Cogn. *amantmul*, *kundri* (Curbitaceae).
Nymphaea alba Linn. White waterlily, *Pondharen-kamal* (Nymphaeaceae).
N. nouchali Burm. f. Syn. *N. pubescens* Willd. *Kamal-kakri*, *neelphul* (Nymphaeaceae).
N. stellata Willd. *Nil-kamal* (Nymphaeaceae).
Phaseolus adenanthus G. F. May (Papilionaceae).
Pouzolzia zeylanica (L.) Benn. Syn. *P. tuberosa* Wt. (Urticaceae).
Smilax zeylanica Linn. *Ramdataun*, *jangli aushbah* (Smilacaceae).
Typha angustata Bory. and Chaub. Syn. *T. elephantina* Gr. Elephant grass, *gond-patar* (Typhaceae).
Typhoniu mbulbiferum Dalz. (Araceae).
T. divaricatum Decne (Araceae).

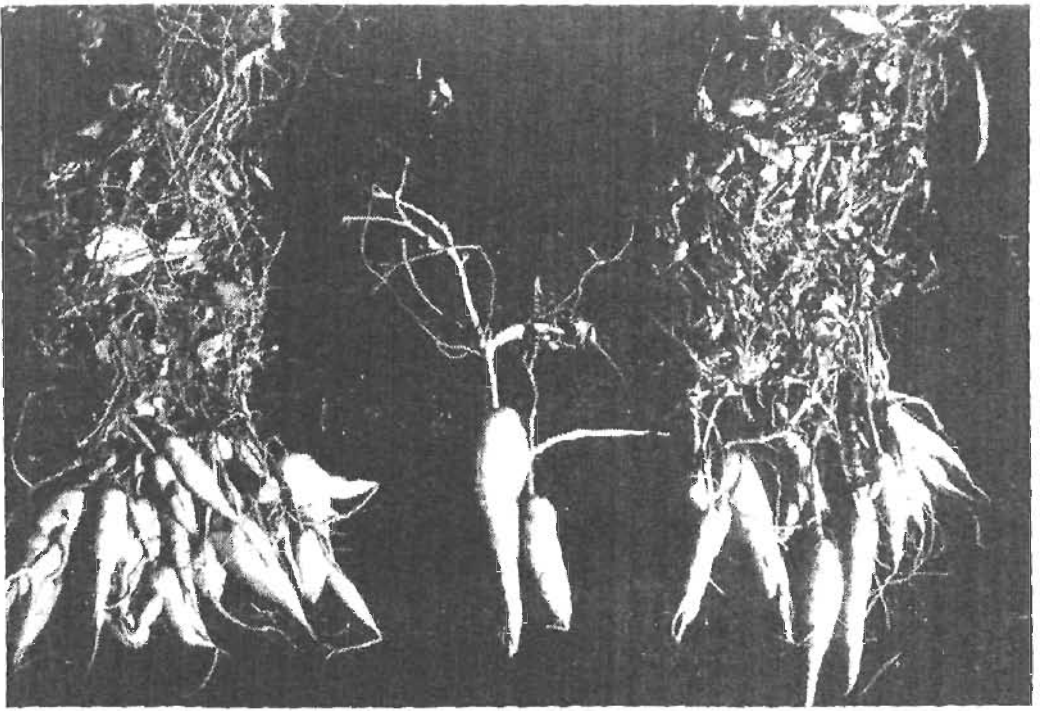


Fig. 5. *Vigna copensis*—tuberculous roots

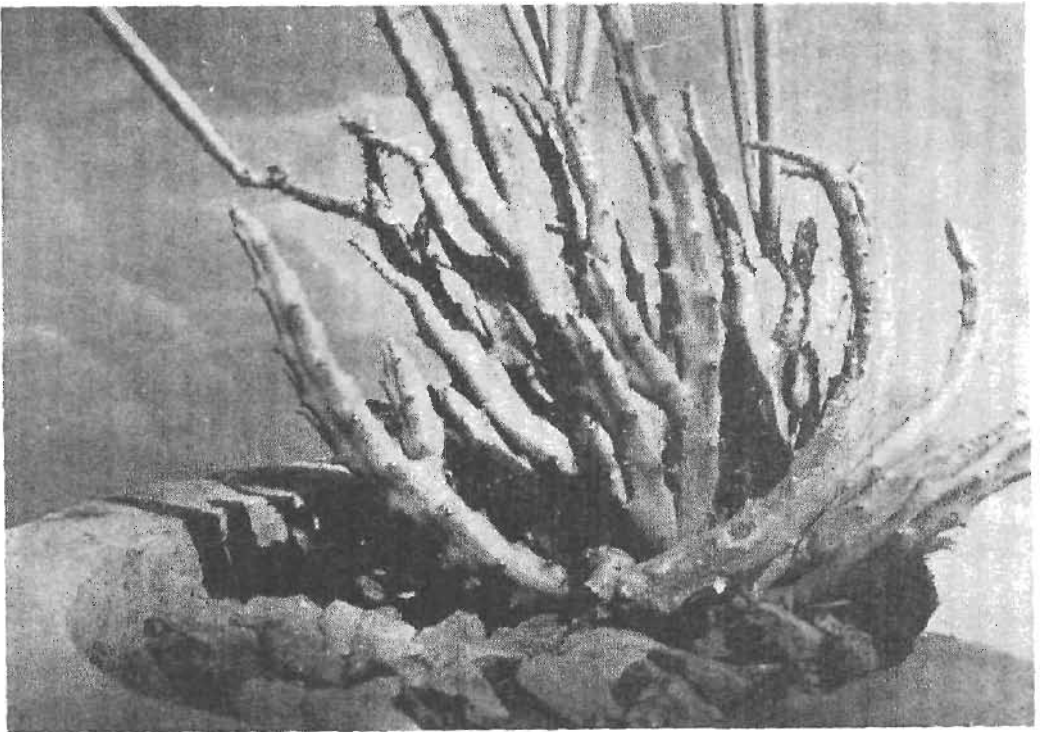


Fig. 6. *Caralluma fimbriata*—fleshy shoots

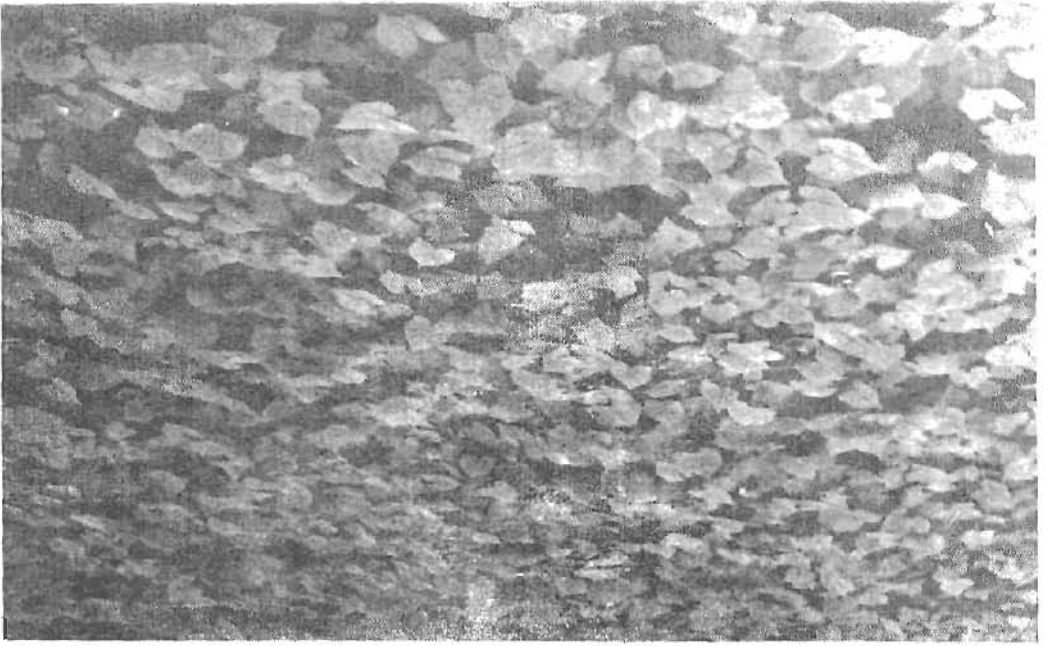


Fig. 7. *Ipomoea aquatica*—natural stand

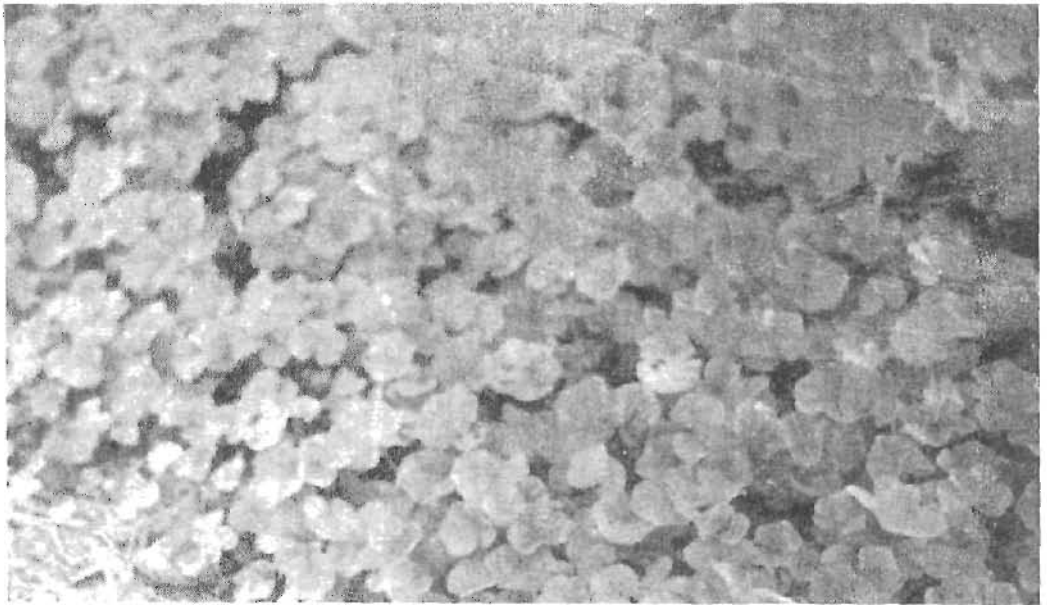


Fig. 8. *Malva verticillata*—natural stand

3. PLANTS WITH EDIBLE GREENS

MANY wild occurring annuals are used as greens. About 220 such kinds belonging to botanically different groups like Amaranthaceae, Chenopodiaceae, Polygonaceae, Araceae, Nymphaeaceae, Papilionaceae, Convolvulaceae, Compositae, Malvaceae and others occur in India. While some of the leafy types occur widely, e.g., *Portulaca oleracea*, *Commelina obliqua*, *Chenopodium album*, *Amaranthus gangeticus*, *A. viridis*, *Celosia argentea*, *Digera alternifolia*, *Trianthema* spp., others are more local or regional in occurrence. In the drier tracts fleshy parts of types like *Salsola* and *Suaeda* species, *Aerva* spp., *Salicornia brachiata*, and *Caralluma fimbriata* are consumed as vegetables. In Bihar, *Leucas lanata*, *Lobelia trigona* and *Desmodium parvifolium* are also eaten likewise. In north-eastern region, the hill tribals of Manipur consume *Lysimachia candida* as a pot-herb. The leaves and shoots of *Natsiatum hypelicum* are cooked with fish, of *Lasia spinosa* (young leaves) in curries, and those of *Houttuynia cordata* are much relished as a cooked leafy vegetable. A thistle-like plant *Cirsium lipskyi* is also eaten here in this way. Apart from these herbs, many woody perennials are also consumed as greens. Thus the Khasi tribals eat the leaves of *Ardisia* spp.; as vegetable after cooking and the Mikirs cook with fish the leaves of *Maliosma pinnata*. The leaves and slender shoots of *Casuarina esculenta* and *C. glomerata* are eaten either as vegetable or cooked in rice. Amongst other consumable kinds are the leaves of *Embelia* spp.; *Conocephalus suaveolens*, *Campanumoea parviflora* and *Pegia nitida*. Besides, the leaves of *Nymphaea*, *Colocasia*, *Alocasia* and plants of *Ipomoea aquatica* and *Enhydra fluctuans* are much consumed and often sold in the local markets.

In the Himalayas, many species of *Polygonum* are used as greens. *Phytolacca acinosa*, *Fagopyrum* spp., *Malva* spp., *Rumex* spp., *Lamium album* and *Urtica* spp., are also cooked here as leafy vegetables. In higher western Himalayas, *Cicer soongaricum* and *Crambe cordifolia*; in Lahul *Eremurus himalaicus*, *Sedum* spp., and *Origanum vulgare*, and in Ladakh *Arenaria holosteoides* and *Urtica hyperborea* are eaten besides others as greens, being cooked into vegetable.

Along the coastal areas, the leaves of *Sesuvium portulacastrum* are eaten as spinach and that of *Scaevola taccada* are consumed as vegetable, apart from some of the commonly occurring types mentioned above.

In *Asparagus adscendens*, *Bambusa bambos*, *Dendrocalamus hamiltonii* and *Calamus* species, the shoots are eaten. Bamboo-shoots in particular are favourite with Manipur and other tribals of north-eastern region. The shoots of *Calamus rotang* are eaten even as a delicacy.

Many types possess acidic leaves which may be eaten cooked or in the form of salad and chutney. *Oxalis maritima*, *O. acetosella*, *Impatiens parviflora* and *Acacia concinna* are used like this. The acidic young shoots of

Polygonum molle are used in the preparation of jellies. The leaves of *Enhydra fluctuans* and *Mussaenda glabra* are used as salad and chutney too, is prepared from the latter. The acidic leaves of some shrubs and trees like *Garcinia lanceaefolia*, *Antidesma diandrum*, *Ardisia solanacea* and *Vaccinium donianum* are also consumed by the tribals either cooked or as salad being eaten raw.

In certain cases, consumption of leaves/shoots is in the form of pickles. The young shoots of *Cicer soongaricum* in the Himalayas, and those of *Salicornia brachiata* in the drier region are reported to be used likewise.

The leaves and shoots have also been used indirectly as additions to various food-stuffs, as condiments or flavouring agents. The most familiar is the consumption of the leaves of *Murraya koenigii* particularly in south India. Equally important to the north-Indians in particular are the leaves of *Cinnamomum* spp. Certain plants like *Lippia alba* are used as *sag* in cookery. In the Himalayan plant *Oenanthe javanica*, young shoots are used as condiments, whereas in *Thymus serpyllum* both leaves and young twigs are utilised for flavouring. Just like *Murraya koenigii*, the leaves of *Clausena excavata* and *C. indica* are used in curries for flavouring purposes mainly by the north-eastern tribals. The leaves of *Acronychia laurifolia*, a tree of humid tropical habitat, are also used as condiments. Some of these stuffs are highly priced and costly. In Uttarkhand Himalayas, at Malari bordering Tibet, the tribals collect the leaves of an *Allium* species (*jambu*) which are later dried by crushing. This crushed leafy produce is used as condiment for garnishing cooked dishes and is much in demand by the town inhabitants of lower hills. The tribals carry this produce while migrating down to foot hills with their herd during October.

Table 2 gives the chemical analysis of the leaves of a few plants cooked as vegetable. The *Amaranthus* spp. are rich in iron, proteins and mineral matter; *Ipomoea aquatica* in protein and carbohydrates. In the Himalayas many *Polygonum* spp. are consumed as greens and their analysis reveals that they are rich in carbohydrates, minerals and proteins. The leaves of *Amaranthus gangeticus* and *Ipomoea aquatica* are found particularly rich in vitamin A, and those of *Oxalis acetosella*, *Medicago hispida* and *Cleome icosandra* in vitamin C.

Plants with edible greens are described below :

Acacia concinna DC. *Shikakai*, *banritha* (Mimosaceae). A prickly climbing shrub occurring throughout India mainly in drier tracts. The tender leaves which are acidic are made use of in chutney.

Acronychia pedunculata (L.) Miq. Syn. *A. laurifolia* Bl. (Rutaceae). A small evergreen tree chiefly distributed in humid tropical tracts of western and eastern ghats, north-eastern and lower Himalayan hills. The tender leaves are used as condiments.

- Aerva lanata* Juss. (Amaranthaceae). A herb found throughout India, often in wastelands. The leaves are eaten as a pot-herb. The leaves of *A. scandens* are also used likewise.
- Aeschynomene aspera* Linn. *Sola* (Caesalpiniaceae). A tall herb of marshy or moist places, widely occurring in peninsular region. The tender leaves are eaten.
- Allium (sphaerocephalum)* Linn. (Liliaceae). A herb found in north-western Himalayas. In Lahul, its leaves are eaten. The dried leaves of *A. stracheyi* are used as condiments.
- **Alocasia macrorrhiza* Schott. *Taro, boro-mankachu* (Araceae). A tall herb of marshy places particularly common in north-eastern India. Both the shoots and leaves are eaten cooked. It is also cultivated.
- Alternanthera sessilis* R. Br. *Guru-bhaji, ponagani* (Amaranthaceae). A spreading type, mat forming herb occurring as weed all over India. The young shoots and fleshy leaves are edible.
- A. triandra* Lamk. (Amaranthaceae). A semi-fleshy herb widely distributed in open habitats. The leaves and shoots are cooked as spinach.
- Althaea officinalis* Linn. Marsh mallow; (Malvaceae). A herb found in Kashmir (Himalayas). The plant is used as a green vegetable.
- **Amaranthus blitum* Linn. *Chulai* (Amaranthaceae). A tall herb occurring as weed. The leaves and tender shoots are eaten raw as salad or cooked as vegetable. *A. polygamous*, a closely allied species is also used as a pot-herb.
- **A. spinosus* Linn. Prickly amaranth, *kantelichulai* (Amaranthaceae). A spiny herb common as a rainy season weed. The leaves are eaten cooked as a vegetable.
- A. tricolor* Linn. Syn. *A. gangeticus* L. *Barichulai* (Amaranthaceae). A leafy herb—a very variable plant; largely cultivated but also found run wild. It is used as a vegetable.
- **A. viridis* Linn. *Jangli chulai* (Amaranthaceae). A tender herbaceous, rainy season weed. The leaves and young shoots are eaten cooked.
- Antidesma diandrum* Roth. (Euphorbiaceae). An evergreen shrub or a small tree chiefly occurring in peninsular region and in the foothills of Himalayas. The acidic leaves are eaten as pot-herb. The leaves of *A. bunius* are also eaten.
- Ardisia crispa* DC. Syn. *A. crenata* Roxb. (Myrsinaceae). A small shrub commonly found in north-eastern hills. The leaves are eaten as a vegetable.
- A. polycephala* Wall. (Myrsinaceae). A small tree occurring in north-eastern hills. The young plants are eaten.
- A. solanacea* Roxb. Syn. *A. humilis* Vahl (Myrsinaceae). A shrub or a small tree, found throughout India except in drier tracts. The young fleshy leaves are eaten as salad.

- Arenaria holosteoides* Edgew. (Caryophyllaceae). A slender herb occurring in western Himalayas. The plant is used as a vegetable in Ladakh and Chamba.
- Argyrea nervosa* (Burn. f.) Boj Syn. *A. speciosa* (L.f.) Sw. Elephant creeper, *samander-ka-pal* (Convolvulaceae). A woody climbing shrub common in peninsular region except in dry areas. The leaves are taken as a vegetable.
- Ariopsis peltata* Nimmo (Araceae). A leafy herb found in humid tropical forests, commonly in western ghats. The leaves are used as vegetable.
- Asparagus adscendens* Roxb. *Stawar*, *sal-musli* (Liliaceae). A spiny climbing plant occurring in western Himalayas, eastwards to Kumaon. The young shoots are taken as a vegetable.
- Asteracantha longifolia* Nees. (Compositae). A tall herb common in wet habitats throughout India. The plant is used as a vegetable.
- Bambusa tulda* Roxb. *pekha* (Graminaeae). A tall bamboo, mainly occurring in north-eastern India. The young shoots are pickled and eaten.
- Begonia* spp. (Begoniaceae). Fleshy herbs, chiefly found in humid tropical regions extending to northern hills. The succulent stems are used as pot-herb. The leaves possess a pleasant acidic taste and are eaten as a vegetable.
- Boerhaavia diffusa* Linn. Spreading hogwood, *sant*, *punarnava*, *kalvingikiri* (Bangalore). (Nyctaginaceae). A much spreading herb common in open habitats, and grazed lands. The leaves are eaten as vegetable.
- Bryonopsis laciniosa* Naud. *Bilanja* (Cucurbitaceae). A viny plant occurring throughout India except in dry areas. The leaves are boiled and eaten as a vegetable.
- **Calamus rotang* Linn. (Palmeae). A bamboo found in the humid tracts of India. The young shoots are eaten and are regarded as a delicacy.
- Campanumoea parviflora* Bth. (Campanulaceae). An undershrub confined to Khasi hills mainly. The leaves are eaten cooked.
- Canthium parviflorum* Lamk. *Kirmi* (Rubiaceae). A thorny bush common in peninsular region in scrub forests. The leaves are eaten in curries.
- Capparis spinosa* Linn. Caper bush, *kabava* (Capparidaceae). A hardy shrub widely distributed in tropical region extending to the Himalayas. The leaves are eaten as greens.
- **Caralluma adscendens* Br. (Asclepiadaceae). A fleshy plant occurring in western peninsula mostly in drier tracts. The shoots are eaten cooked. They are also pickled.
- **C. fimbriata* Hk.f. *makedshingi* (Asclepiadaceae). A fleshy herb, occurring mainly in drier tracts of peninsular India. The succulent shoots are used as a vegetable. (Fig. 6).
- Cardamine hirsuta* Linn. Bitter cress (Cruciferac). A herb of temperate Himalayas. The leaves are used as salad.

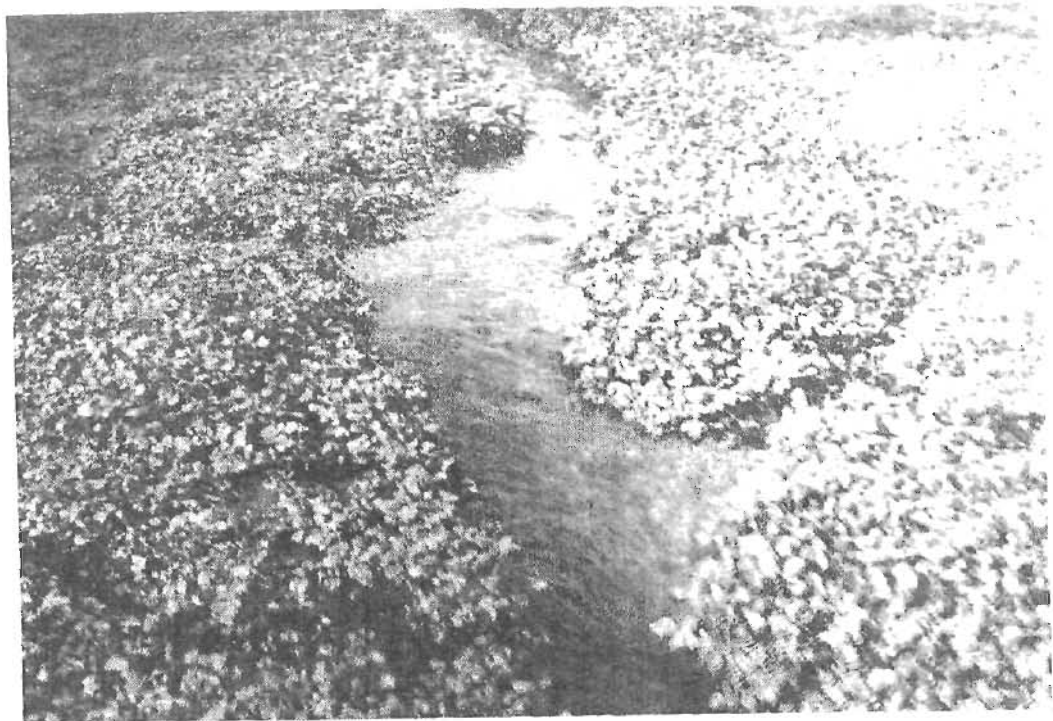


Fig. 9. *Nasturtium* sp.—natural stand along water courses

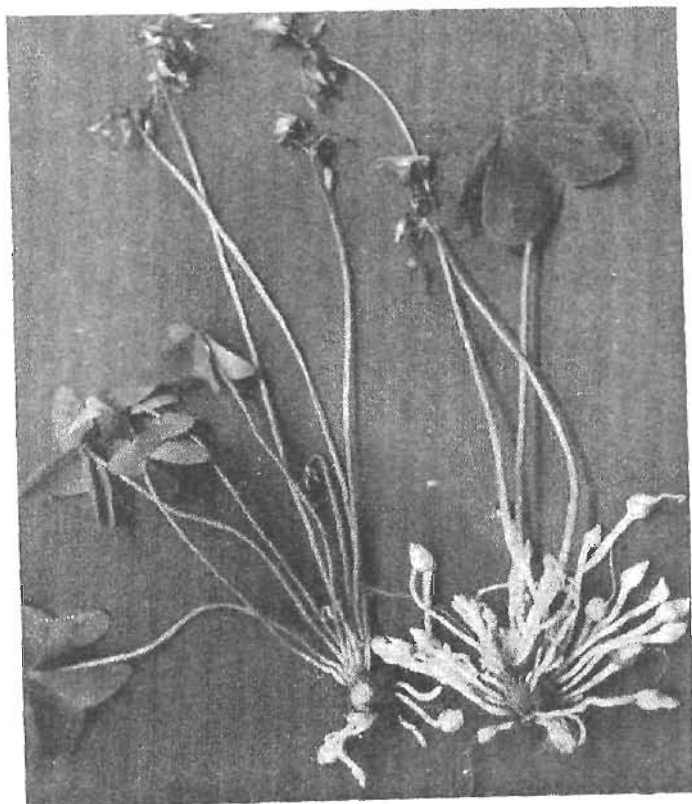


Fig. 10. *Oxalis acetosella*—the plant



Fig. 11. *Phytolacca acinosa*-- leafy herb

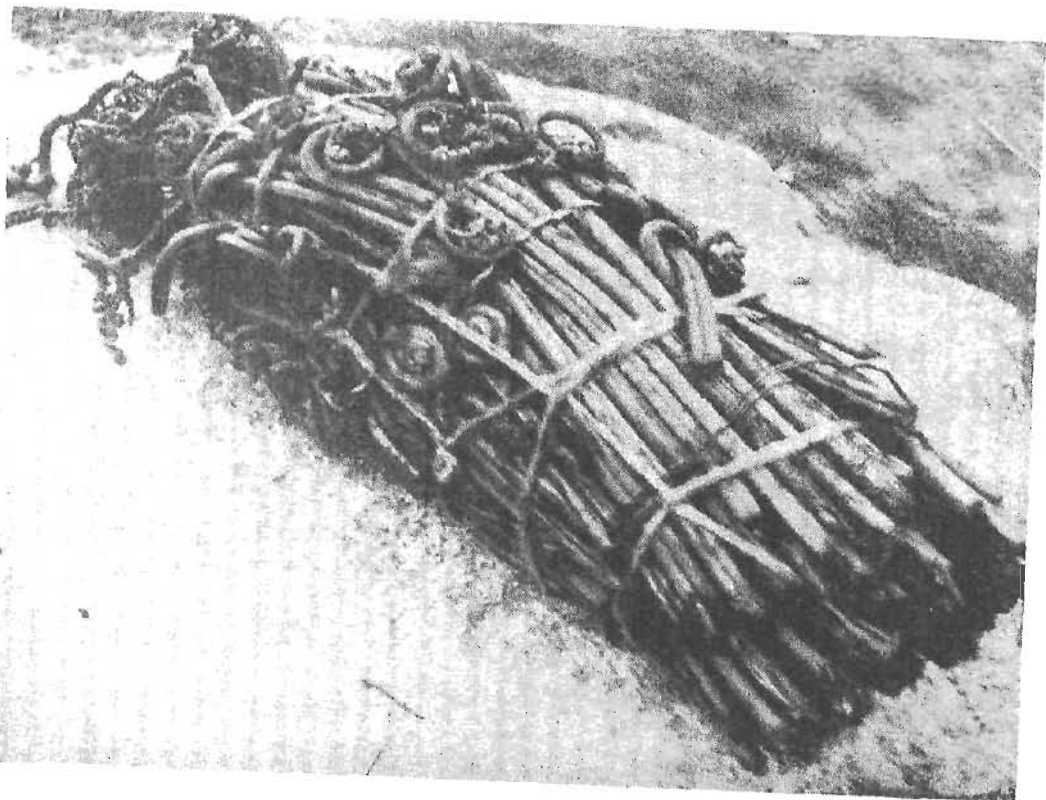


Fig. 12. *Pteridium aquilinum*--young fronds

- Casearia esculenta* Roxb. (Flacourtiaceae). A small tree chiefly occurring in western peninsula and north-eastern hills. The leaves and tender shoots are eaten cooked in curries by the Mikirs.
- C. glomerata* Roxb. (Flacourtiaceae). A small tree found in peninsular region, lower hills of northern India, extending to Khasi hills. The young leaves and tender shoots are eaten either as vegetable or are cooked with rice and fowl, especially by the Mikirs.
- Cassia tora* Linn. Sickle senna, *pamaar* (Caesalpiniaceae). An undershrub found throughout India. The tender leaves are boiled and eaten as a vegetable.
- Cayratia carnosa* Gagnep. Syn. *Vitis trifolia* L. *Amarlata*. (Vitaceae). A climber found in humid areas. The leaves are eaten cooked as spinach.
- Celosia argentea* Linn. *Safed murga-ka-phul*, *salaria* (Amaranthaceae). A tall herb common as a rainy season weed. The leaves are used as spinach.
- Gentella asiatica* (L). Urb. Syn. *Hydrocotyle asiatica* Linn. Asiatic pennywort, *brahmi* (Umbelliferae). A creeping herb found in wet places. It is eaten as a vegetable.
- Ceropegia bulbosa* Roxb. *Khapparkadu* (Asclepiadaceae). A twiner found in the humid parts of central and western India. The plant is used as a pot-herb.
- **Chenopodium album* Linn. Lamb's quarters, *bathu-sag* (Chenopodiaceae). A herb common as a winter weed all over except in more southern areas, is also cultivated. The leaves and twigs are used as vegetable.
- **C. blitum* Hk.f. (Chenopodiaceae). A herb of temperate region occurring in Kashmir and other parts of Himalayas. The leaves and shoots are used as vegetable in Ladakh.
- **C. murale* Linn. *Bathu* (Chenopodiaceae). A herbaceous winter weed. The leaves and tender twigs are cooked as a vegetable.
- Chlorophytum tuberosum* Baker (Liliaceae). A herb mainly occurring in humid tracts of the peninsular region. The leaves are used as a vegetable.
- **Cicer soongaricum* Steph. (Papilionaceae). A herb confined to higher ranges of western Himalayas (Ladakh and Lahul). The young shoots are used as pot herb and sometimes also pickled. From the viscid exudation of the leaves a vinegar is also prepared.
- **Cichorium intybus* Linn. *Kasini* (Compositae). A herb found as weed in Punjab, and extending to colder parts of western Himalayas. The young shoots are used as salad, and the leaves are eaten as a vegetable.
- **Cinnamomum tamala* Nees and Eberm. *Tejput* (Lauraceae). A small tree found wild in humid sub-tropical tract and in the lower Himalayan ranges. The leaves are used as condiments.
- Cirsium lipskyi* Petrak Syn. *Cnicus griffithii* Hk.f. (Compositae). A thistle-like herb occurring in north-eastern hills. The young shoots are eaten cooked.

- Cissus adnata* Roxb. Syn. *Vitis adnata* Wall. ex Wt. (Vitaceae). A viny plant met within the Himalayas, eastern and western ghats and in Assam. The membranous leaves are eaten.
- C. discolor* Bl. Syn. *Vitis discolor* Dalz. (Vitaceae). A climber found in humid tropical-subtemperate Himalayan tract. The leaves are eaten.
- **C. quadrangularis* Linn. The edible stemmed vine, *hadjora*, *harsankari* (Vitaceae). A succulent climbing plant occurring throughout India. The young leaves and fleshy shoots are cooked, and also used in south in preparation of curries and pappadams. In south (*Tenkasi*) two types occur; *berendai* is the edible type and *marul*, the non-edible type.
- **C. repens* Lamk. (Vitaceae). A climbing shrub found mainly in humid tropical forests of western and eastern ghats, and in north-eastern hills. The young fleshy shoots and leaves are acidic in taste and eaten cooked as a substitute for sorrel.
- **Clausena excavata* Burm.f. *agnijal* (Rutaceae). A shrub occurring in humid parts of peninsular India, in the lower Himalayan ranges and in north-eastern hills. The leaves are used in curries just like *Murraya koenigii* leaves.
- C. heptaphylla* Wt. & Arn. (Rutaceae). A shrub of north-eastern hills. The leaves are chewed with betel-leaves.
- C. indica* Oliver (Rutaceae). A shrub occurring in western ghats. The aromatic leaves are used for flavouring curries.
- Cleome icosandra* Linn. Syn. *C. viscosa* L. *hulhul*, *hurhur* (Capparidaceae). A tall herbaceous weed. The plant is used as a vegetable after discarding the flower-tops; also eaten boiled with chillies and salt as salad.
- Clerodendrum colebrookianum* Walp (Verbenaceae). An evergreen shrub found in Khasi hills and eastern Himalayas. The young leaves are eaten.
- C. indicum* (L.) Kuntze Syn. *C. siphonanthus* R.Br. (Verbenaceae). A shrub occurring in western peninsula, eastern India, Kumaon eastwards to Khasi hills. The leaves are used as vegetable by Mikirs.
- C. serratum* Spr. *Barangi* (Verbenaceae). An evergreen shrub occurring throughout India except in drier tracts. The leaves are used as a vegetable.
- **Colocasia esculenta* (L.). Schott. Syn. *C. antiquorum* Schott. *taro*, *arum*, *arbi*, *kachalu*, (Araceae). A tall semi-fleshy herb occurring wild mainly in wet lands of eastern India, also cultivated. The leaves and shoots particularly of the small leaved purple stalked variety (*Chamkora*) are eaten cooked as a vegetable.
- **Commelina benghalensis* Linn. *Kanchara* (Commelinaceae). A creeping-sub erect semi-fleshy herb occurring throughout India. The leaves are used as a vegetable.



Fig. 13. *Trianthema portulacastrum* - fleshy plant

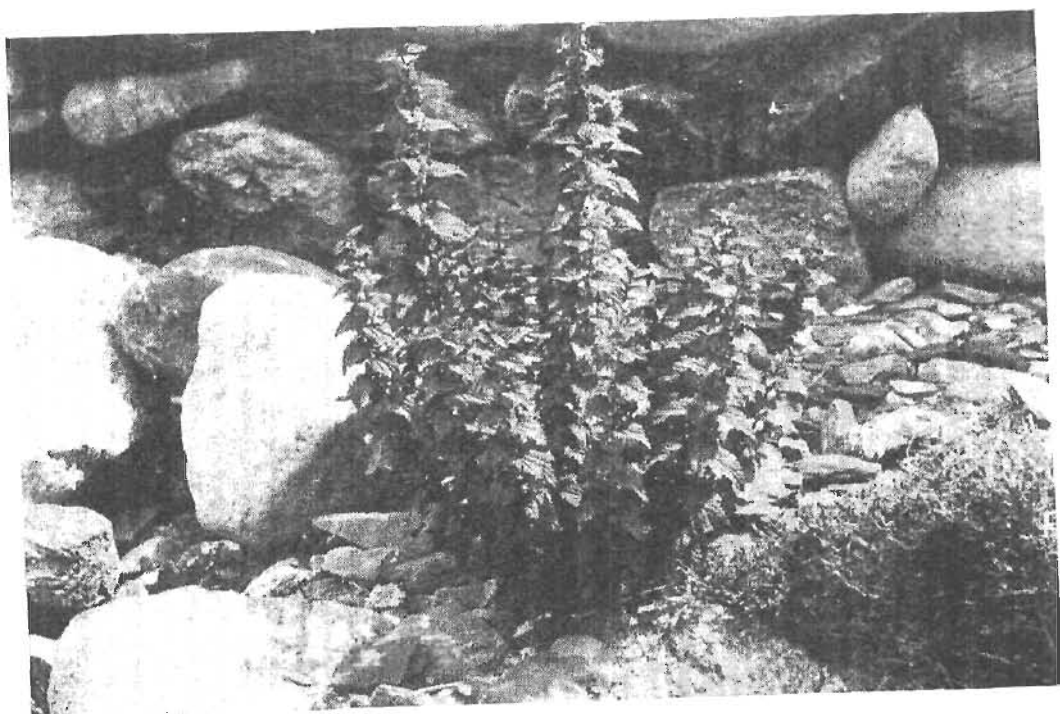


Fig. 14. *Urtica* sp. called *Zachtul* in Ladakh

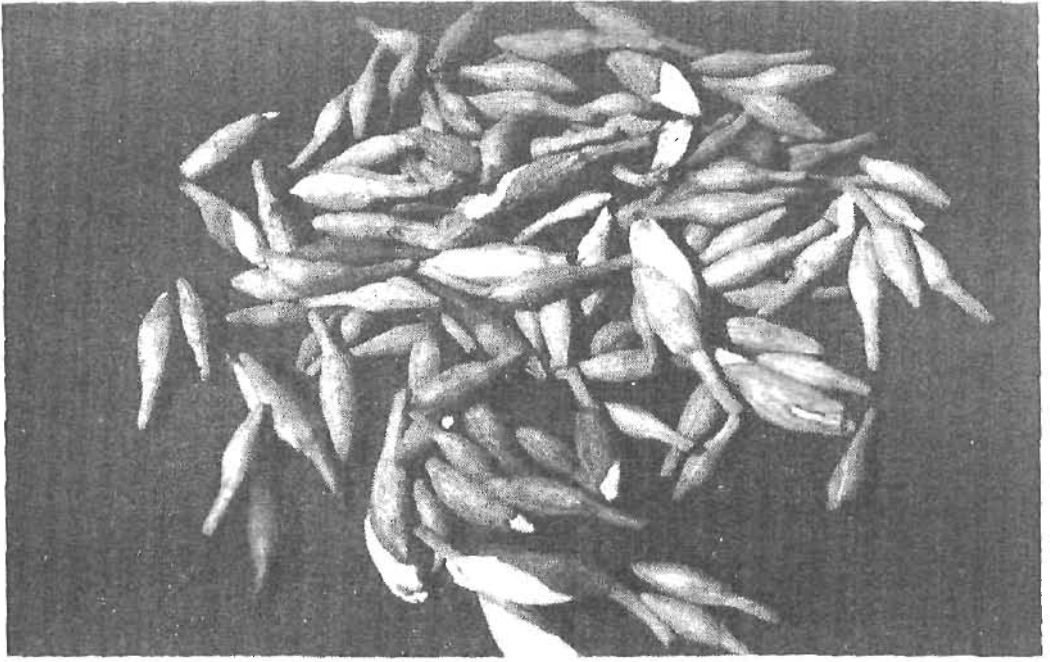


Fig. 15. *Bauhinia variegata*—flower buds



Fig. 16. *Madhuca indica*—flowers

- **C. obliqua* Buch.-Ham. *Kanjura* (Commelinaceae). A sub-erect herb occurring throughout India. The leaves and shoots are used as a vegetable.
- Conocephalus suaveolens* Bl. (Moraceae). An evergreen climbing shrub occurring in north-eastern hills. The leaves are eaten cooked.
- Convolvulus pleuricaulis* Choisy (Convolvulaceae). A climber found in the peninsular region extending to sub-Himalayan tract. The plant is used as a vegetable.
- Crambe cordifolia* Ster. (Cruciferae). A herb found in north-western Himalayas. The young leaves are eaten as a pot-herb.
- Cyanotis tuberosa* Roem. and Schult. (Commelinaceae). A herb found in western and eastern peninsular region. The leaves are eaten as a pot-herb.
- Dendrocalamus hamiltonii* Nees, *kaghziban* (Gramineae). A tall bamboo occurring mainly in eastern Himalayas and north-eastern hills. The shoots are boiled and eaten.
- Desmodium parvifolium* DC. (Papilionaceae). A procumbent herb, occurring in plains and hills throughout India except in drier tracts. The leaves are used as a vegetable in Chota Nagpur.
- Digera alternifolia* (L.) Aschers Syn. *D. arvensis* Forsk. *Latmhuria*, *lasua*, *tandla* (Amaranthaceae). A tall herbaceous rainy season weed. The leaves and tender shoots are eaten as a pot-herb.
- Dioscorea tomentosa* Koenig (Dioscoreaceae). A climber found in the western ghats. The young shoots are eaten as greens.
- Embelia gamblei* Kurz (Myrsinaceae). A climbing shrub mainly occurring in north-eastern hills and lower parts of eastern Himalayas. The leaves are eaten cooked.
- E. nagushia* D. Don (Myrsinaceae). A climbing shrub confined to Khasi hills and adjoining region. The leaves and tender shoots are eaten cooked.
- E. subcoriacea* (Clarke) Mez. (Myrsinaceae). A climbing shrub occurring in north-eastern hills. The leaves are eaten by the Khasi tribals.
- Emilia sonchifolia* L. *Hirankhuri* (Compositae). A herb found in wet places. The sour leaves are used as salad and as a vegetable.
- **Enhydra fluctuans* Lour. *Harhucha*, *harhuch* (Compositae). A tender herb occurring mainly in eastern India extending to Khasi hills. The leaves are eaten as salad and cooked as a vegetable.
- Eremurus himalaicus* Baker, Himalayan desert candle (Liliaceae). A tall herb occurring in western Himalayas. The leaves are used as a vegetable in Lahul valley.
- E. spectabilis* M. Bieb. (Liliaceae). A herb found in the western Himalayas. The young leaves both fresh and dry, are eaten cooked as vegetable.
- Fagara oxyphylla* (Edgew.) Engl. Syn. *Zanthoxylum oxyphillum* Edgew. *Timar mazenga* (Rutaceae). A small tree occurring in western Himalayas eastwards to Khasi hills. The tender shoots are eaten as a vegetable.

- **Fagopyrum cymosum* Meisn. Perennial buckwheat, *banogol* (Polygonaceae). A tall herb found in the western Himalayas eastwards to Khasi hills. The leaves are used as a vegetable.
- Garcinia lanceaefolia* Roxb. (Guttiferae). A tall evergreen tree occurring mainly in Khasi hills and adjoining mountains. The subacidic leaves are eaten cooked by the Mikirs.
- Gardenia campanulata* Ross. *Bitmara* (Rubiaceae). A shrub or small tree of eastern India. The leaves are cooked as a vegetable.
- Gisekia pharmaceoides* Linn. *Balu-ka-sag* (Aizoaceae). A semi-fleshy herb common in drier parts of India. The leaves are eaten as vegetable.
- Gymnema sylvestris* R.Br. *gurmar* (Asclepiadaceae). A woody climber mainly occurring in peninsular India. The leaves are eaten as a pot-herb.
- Hedyotis capitellata* Wall. (Rubiaceae). A herb found in north-eastern hills. The leaves are eaten.
- Hibiscus surattensis* Linn. *Ran-bhindi* (Malvaceae). A weak-stemmed trailer found in tropical peninsular region. The leaves and tender stems are eaten. *H. furcatus* also used likewise.
- Holostemma annularis* (Roxb.) Schum. Syn. *H. rheedii* Wall. *Chirval* (Asclepiadaceae). A climbing shrub occurring all over India except in drier tracts. The leaves are used as a vegetable.
- **Houttounia cordata* Thunb. (Sauraraceae). A perennial herb occurring in western Himalayas eastwards to north-eastern hills. The plant is cooked as vegetable and much relished.
- Hygrophila salicifolia* Nees Syn. *H. angustifolia* auct. non R.Br. (Acanthaceae). A tall herb occurring all over India. The leaves are eaten as pot-herb.
- H. spinosa* T. And. Syn. *Ruellia longifolia* Nees (Acanthaceae). A herb found commonly in the peninsular tracts. The leaves are eaten.
- Impatiens parviflora* DC. Small balsam (Balsaminaceae). A tall Himalayan herb. The leaves are sour and used as salad.
- **Ipomoea aquatica* Forsk. Swamp cabbage, *kalmi-sag*, *kamli*, *patua-sag* (Convolvulaceae). An aquatic trailing herb found widely in wet lands. The leaves and shoots are eaten cooked as a vegetable. (Fig. 7)
- **I. cynosa* Roem. and Schult. *Karmbi arak* (Convolvulaceae). A climber occurring throughout India except in drier areas. The leaves are eaten by the Santals as a pot-herb.
- I. hispida* Roem. and Schult. Syn. *I. erioptera* R.Br. *Ghahati*, *brotā* (Convolvulaceae). A climber found throughout India. The leaves and shoots are used as a vegetable.
- I. maxima* (L.f.) G. Don ex Sw. Syn. *I. sepriaria* Koenig, *ban-kamli* (Convolvulaceae). A twining herb occurring throughout India in hedges and near wet lands. The leaves are used as a vegetable.

- I. reniformis* Choisy (Convolvulaceae). A procumbent plant occurring in peninsular region in waste places particularly in black cotton soils. The plant is used as a pot-herb.
- I. uniflora* Roem. and Schult. (Convolvulaceae). A twining herb found in peninsular region (except in drier areas) especially in moist places. The plant is eaten as a vegetable.
- Lactuca scariola* Linn. (Compositae). A herb found in the western Himalayas. The leaves are eaten.
- Lamium album* Linn. White deadnettle (Labiatae). A herb occurring in western Himalayas. The shoots (stem tops) are used as a vegetable.
- Lannea coromandelica* (Houtt.) Merr. Syn. *Odina woder* Roxb. *Jhingan* (Anacardiaceae). A deciduous tree common in peninsular region. The leaves are eaten cooked with rice.
- Laportea terminalis* Wt. (Urticaceae). A under-shrubby plant found in higher peninsular hills and in the Himalayas. Young shoots are eaten after boiling.
- Lasia spinosa* (L.) Thw. Syn. *L. macrophylla* Schoot. *Kanta-haclu* (Araceae). A prickly herb found in lower Himalayas, and eastwards to West Bengal and north-eastern hills. The young leaves are eaten as vegetable and are used in curries.
- Launaea nudicaulis* Hk. f. (Compositae). A herb common throughout India. The leaves are used in curries in parts of western ghats.
- Leea indica* (Burn.) Merr. *Kurkurjiwah* (Vitaceae). An evergreen shrub found chiefly in tropical forests of peninsular India extending to north-eastern hills and lower Himalayas. The tender shoots are used as a vegetable.
- L. macrophylla* Roxb. ex. Hornem. *Dholsamudra* (Vitaceae). A tall herb found throughout India except in drier tracts. The leaves are eaten.
- Leucas aspera* Spr. (Labiatae). A herb occurring throughout India. The plant is used as a pot-herb.
- L. cephalotes* Spr. *Dhurpi-sag, goma, motapati* (Labiatae). A tall herb common in plains and lower hills of Himalayas, often seen as a weed. The leaves and young shoots are eaten as a pot-herb.
- L. clarkei* Hook.f. (Labiatae). A common weed of cultivation in Chota Nagpur in Bihar. The leaves are eaten as a pot-herb.
- L. lanata* Bth. (Labiatae). A tall herb occurring throughout India in plains and hills. The leaves and young shoots are eaten as a pot-herb.
- L. mollissima* Wall. (Labiatae). A herb found throughout India in plains and hills except in drier region. The plant is eaten as a pot-herb by Santhals.
- Liappia alba* (Mill.) N.E.Br. ex Britton and Wilson Syn. *L. geminata* H.B. and K. (Verbenaceae). A herb confined mainly to eastern India. The

- leaves are eaten as vegetable in Khasi hills. The plant is used as a *sag* in cooking.
- Lobelia trigona* Roxb. (Campanulaceae). A herb occurring in the humid tracts of India. The leaves are eaten as a pot-herb in Chota Nagpur.
- Lysimachia candida* Lindl. (Primulaceae). A sub-temperate herbaceous plant found in Himalayas, and higher hills of peninsular region up to Nilgiris, eastwards to Khasi hills and Manipur. The plant is eaten as a vegetable by Manipur tribals.
- Mackaya neesiana* Nees (Acanthaceae). A small under-shrub occurring in north-eastern hills. The leaves are eaten as vegetable.
- Maesa chisia* D. Don (Myrsinaceae). A shrub or a small tree found in north-eastern hills. The young shoots are eaten.
- M. indica* Wall. (Myrsinaceae). An evergreen shrub found in hills of peninsular India extending to lower Himalayas. The leaves are used in curries in north Kanara.
- **Malva parviflora* Linn. *Panirak* (Malvaceae). A procumbent herb occurring in lower Himalayas and eastern India. The plant is eaten as a pot-herb.
- **M. rotundifolia* Linn. *Khubasi* (Malvaceae). A herb mainly found in the western Himalayas. The tender shoots are eaten as salad.
- M. sylvestris* Linn. *Gulkhair*, *kunzi* (Malvaceae). A herb found mainly in the Himalayas from Kashmir to Kumaon. The plant is used as a pot-herb.
- **M. verticillata* Linn. (Malvaceae). A herb occurring in the Himalayas and higher hills of north-eastern India and Nilgiris. The plant is used as a pot-herb. It is also cultivated. (Fig. 8).
- **Medicago hispida* Gaertn. Syn. *M. denticulata* Willd. 'Toothed Bur Clover, *maina* (Papilionaceae). A mat forming herb common in the Himalayas, higher hills of West Bengal, in Nilgiris and other hills of western ghats, and as winter weed in plains of northern India. The plant is used as a pot-herb.
- Medinella rubicunda* Bl. (Melastomaceae). A tall shrub found in north-eastern India. The leaves are eaten cooked.
- Meliosma pinnata* Roxb. (Sabiaceae). A small tree found in north-eastern hills and in eastern Himalayas. The leaves and tender twigs are eaten cooked with fish by Mikirs.
- Melochia corchorifolia* Linn. *Tikiokra* (Sterculiaceae). A tall herb found throughout hotter parts of India. The leaves are eaten as vegetable.
- Melothria heterophylla* Cogn. *Amantmul*, *kundri* (Cucurbitaceae). A twining herb occurring throughout India. The leaves are edible.
- Merremia emarginata* Hall.f. (Convolvulaceae). A climber found commonly in peninsular India except in dry areas. The plant is eaten as a pot-herb.



Fig. 17. *Nelumbo nucifera*—young flowers



Fig. 18. *Aegle marmelos*—tree in fruit

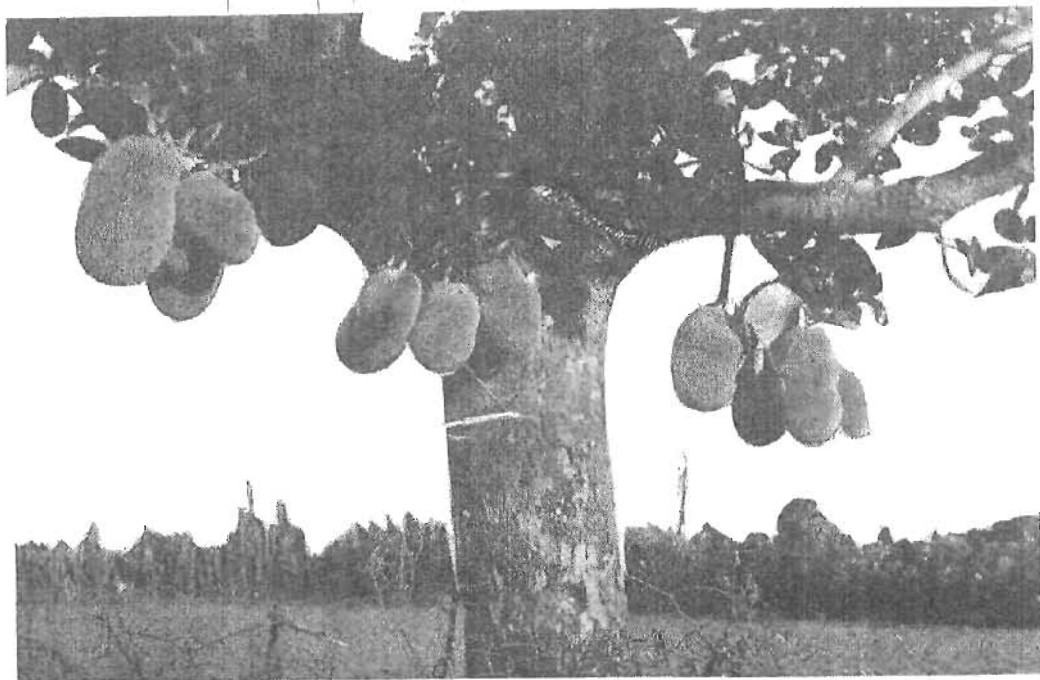


Fig. 19. *Artocarpus heterophyllus*—tree in fruit

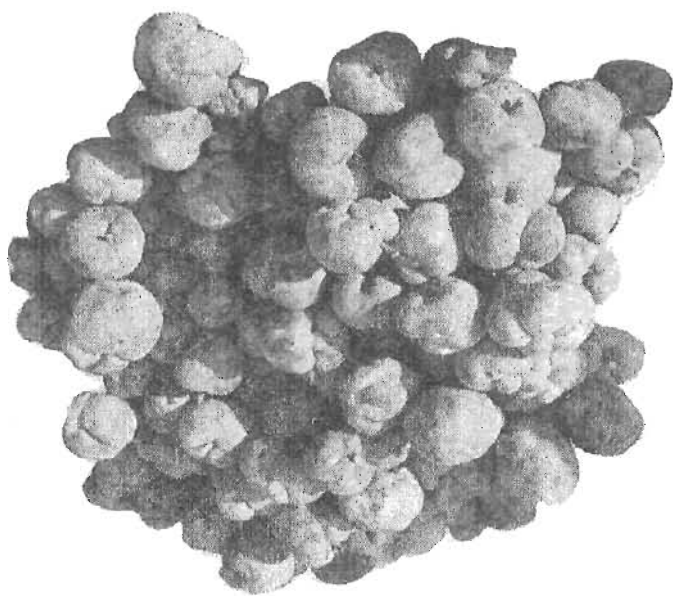


Fig. 20. *Artocarpus lakoocha*—fruits

- M. umbellata* Hall.f. (Convolvulaceae). A climber found mainly in peninsular region and north-eastern hills. The leaves are used as vegetable.
- Mollugo cerviana* Springe (Aizoaceae). A herb found in drier parts of India.
- The tender shoots are used in curries.
- Monochoria hastata* Solms. Syn. *M. hastaefolia* Presl. *Luakia* (Pontederiaceae). An aquatic herb found throughout India along ponds and swamps. The young leaves are eaten.
- **Murraya koenigii* (L.) Spr. *Mitha-nem* (Rutaceae). An evergreen shrub commonly found in humid tropical forests of India, also a popular courtyard plant especially in south. The leaves are used to give flavour to curries.
- Mussaenda glabra* Vahl (Rubiaceae). A shrub mainly occurring in north-eastern India ascending to sub-Himalayan tract. The young leaves are eaten as salad and in chutney.
- ↘ *M. frondosa* Linn. *Bedina*, *bebina* (Rubiaceae). A climbing shrub found in hills of peninsular India, lower Himalayas and Khasi hills. The leafy bracts are eaten cooked.
- M. roxburghii* Hk.f. (Rubiaceae). A shrub found in eastern Himalayas and north-eastern hills. The leaves are eaten as a vegetable.
- **Nasturtium officinale* R. Br. Water-ress, *brahmi-sag* (Cruciferae). A small herb naturalized at many places—W. Bengal, Orissa, in peninsular region, otherwise cultivated. The plant is cooked as vegetable; also used as garnish for various dishes. (Fig.9).
- ↘ *Natsiatum herpeticum* Buch-Ham. (Icacinaceae). A shrub found in lower Himalayas and hills of eastern India. The leaves and tender shoots are eaten cooked.
- **Nelumbo nucifera* Gaertn. Syn. *Nelumbium speciosum* Willd. East Indian lotus, *kamal*, *kanwal* (Nymphaeaceae). A common aquatic herb. The young leaves are eaten cooked.
- Neptunia oleracea* Lour. *Lajalu* (Mimosaceae). A common aquatic herb. The plant is consumed as a pot-herb.
- Nothosaerva brachiata* Wt. (Amaranthaceae). A herb found in the drier, hotter tracts of India. The plant is used as a green vegetable.
- ↘ *Nymphoides cristatum* O. Kuntze Syn. *Limnanthemum cristatum* Griseb. (Gentianaceae). An aquatic herb common in tropical ponds. The plant is used as a vegetable.
- **Oenanthe javanica* (Bl.) DC. Water Drop-wort, *saya* (Umbelliferae). A stoloniferous herb of marshy lands occurring in western Himalayas eastwards to Assam and adjoining hills. The plant is eaten raw or as vegetable, often stewed with rice. The young shoots are also used as condiments.
- Olax acuminata* Wall. (Olacaceae). A shrub or a small tree of north-eastern

- India. The leaves are eaten cooked with fish and meat by the Mikir tribals.
- Origanum vulgare* Linn. (Labiatae). A herb found mainly in the Himalayan tract. The leaves are eaten as a pot-herb in Lahul.
- Ottelia alismoides* Pers. (Hydrocharitaceae). A common aquatic herb. The leaves and petioles are consumed as a vegetable.
- **Oxalis acetosella* Linn. Common wood sorrel (Oxalidaceae). A creeping herb occurring in Himalayas and higher tropical hills. The acidic leaves are eaten. (Fig. 10).
- O. corniculata* Linn. India sorrel, *khatti-buti*, *champa-melhi*, *amrul-sag*, *amboia* (Oxalidaceae). A creeping herb common throughout India. The acidic leaves are eaten as salad or as spinach.
- O. martiana* Zucc. Syn. *O. corymbosa* DC. (Oxalidaceae). A creeper found in higher tropical hills and in the Himalayas. The acidic leaves are eaten by the hill people.
- Oxyria digyna* Hill. (Polygonaceae). A herb found in western Himalayas. The leaves tasting like sorrel can be eaten raw or in the form of chutney.
- Paedaria foetida* Linn. (Rubiaceae). A climber found in eastern, mainly hilly tracts. The leaves are made into stews and curries.
- Paeonia emodi* Wall. (Ranunculaceae). A herb found in western Himalayas. The young shoots are eaten as a vegetable.
- Pavetta subcapitata* Hk.f. (Rubiaceae). A shrub confined to north-eastern hills. The leaves are eaten cooked.
- Pavonia odorata* Willd. (Malvaceae). A perennial herb common in open woods and wastelands in peninsular region. The leaves are edible.
- Pegia nitida* Colebr. Syn. *Tapiria hirsuta* Hk.f. (Anacardiaceae). A small tree of north-eastern hills. The leaves are eaten as vegetable by the Mikirs.
- **Perilla frutescens* (L.) Britt. Syn. *P. ocyroides* L. (Labiatae). A tall aromatic herb found mainly in the Himalayas and north-eastern hills. The leaves are eaten by the hill people. Much grown as a courtyard plant by hill tribals of eastern region.
- **Phytolacca acinosa* Roxb. Sweet Belladonna. Indian Poke, *malazor*, *sarangun* (Phytolaccaceae). A fleshy herb occurring in western Himalayas eastwards to Assam hills. The leaves and twigs are cooked as a vegetable. It is also cultivated in the Himalayas. (Fig. 11).
- Pieris hieracioides* Linn. (Compositae). A herb found in Kashmir eastwards to Khasi hills, also in Nilgiris. The plant is eaten as pot-herb.
- Ptilostigma malabaricum* Linn. Syn. *Bauhinia malabarica* Roxb. Malabar mountain Ebony, *amli*, *koinarpoinar* in Bihar (Caesalpiniaceae). A tree common in peninsular tracts. The young shoots with leaves (which are acidic) are eaten by Bihar tribals.
- Pisonia grandis* R.Br. Syn. *P. alba* Spanoghe, Lettuce tree (Nyctaginaceae). A small evergreen tree wild in the beach forests of Andaman, Nicobars

and laccadive Islands. The leaves are eaten. The tree lettuce grown chiefly along sea coast is considered to be a cultigen of this.

- **Polygonum alpinum* All. (Polygonaceae). A herb found in western Himalayas. The plant is eaten raw or cooked and is said to taste like rhubarb.
- P. aviculare* Linn. *Machoti*, *banonalia* (Polygonaceae). A herb found in the Himalayas from Kashmir to Kumaon. The plant is eaten as a vegetable.
- P. bistorta* Linn. Syn. *P. paleaceum* Wall. ex Hk.f. Bistort, snakeroot (Polygonaceae). A herb found in western Himalayas eastwards to Assam and adjoining hills. The plant is used in stews and soups.
- P. chinense* Linn. (Polygonaceae). A rambling undershrub found all over India especially in the hills. The plant is used in preparation of curries.
- P. glabrum* Willd. (Polygonaceae). A tall herb common in wet lands. Young shoots are cooked and eaten.
- P. limbatum* Meissn. (Polygonaceae). A herb found in swamps all over India. The leaves are eaten as a vegetable.
- P. microcephalum* D. Don (Polygonaceae). A herb mainly confined to north-eastern hills. The young tops are used for flavouring other vegetables.
- P. minus* Muds. (Polygonaceae). A slender herb occurring in Himalayas. The leaves are eaten in curries.
- **P. molle* D. Don. Syn. *P. paniculatum* Bl. (Polygonaceae). A shrubby plant found in central Himalayas eastwards to Mashmi hills and in Nilgiris. The young shoots are pleasantly acidic and eaten like rhubarb; also used in the preparation of jelly.
- P. nepalense* Meissn. Sy. *P. alatum* Buch.-Ham. (Polygonaceae). A herb found in the humid parts of India, extending to Himalayas. The leaves are eaten cooked.
- P. orientale* Linn. Prince's feather (Polygonaceae). A herb or an undershrubby plant found in western peninsula and north-eastern region. The shoots possess sour taste. The plant can be eaten as a pot-herb.
- **P. perfoliatum* Linn. (Polygonaceae). A rambling shrub occurring in Himalayas eastwards to Khasi hills. The plant has a pleasant acid taste and is wholesome. It is eaten in north-eastern hills.
- P. plebeium* R. Br. (Polygonaceae). A prostrate herb common throughout India. The plant is used as a vegetable.
- P. polystachyum* Wall. ex Meissn. (Polygonaceae). A perennial herb found in the Himalayas eastwards to Mishmi and other hills. The young leaves are eaten as pot-herb. The stalks are consumed either raw after peeling or stewed like rhubarb.
- P. pulchrum* Bl. Syn. *P. tomentosum* Willd. non Schrell. (Polygonaceae). A herb occurring in peninsular region, particularly along eastern and western coast and in Andaman Islands. The leaves are used as salad.

- P. rumicifolium* Royle ex Bab. (Polygonaceae). A herb found in western Himalayas, eastwards to Khasi and adjoining hills. The young leaves and shoots are acidic and are eaten like rhubarb.
- P. runcinatum* Buch.-Ham. Syn. *P. sinuatum* Royal ex Bal. (Polygonaceae). A creeping herb, occurring in the Himalayas, Kashmir eastwards to Khasi hills. The leaves are eaten raw as well as cooked.
- P. sibiricum* Lax. (Polygonaceae). A dwarf herb found in Kashmir. The leaves are eaten.
- **Portulaca oleracea* Linn. Purslane, *kulfa* (Portulacaceae). A herb common as weed throughout India. Its fleshy leaves are eaten as a vegetable. It is cultivated also.
- **P. quadrifida* Linn. (Portulacaceae). A tiny-leaved herb, a common warm season weed throughout India. The plant is used as a pot-herb.
- P. tuberosa* Roxb. (Portulacaceae). A fleshy herb found throughout peninsular India, but not common. The plant is eaten as a pot-herb.
- Pouzolzia uminea* Wedd. (Urticaceae). A shrub found in western Himalayas eastwards to Khasi hills. The leaves are eaten as a vegetable.
- Premna latifolia* Roxb. *Bokar* (Verbenaceae). A shrub or a small tree occurring in western and eastern India. The leaves and tender shoots are eaten in curries.
- P. obtusifolia* R.Br. (Verbenaceae). A shrub found along western and eastern coasts and in peninsular region up to Khasi hills. The leaves are eaten cooked.
- **Pteridium aquilinum* Kuhn. Bracken fern, *lingri* or *lungra* (Polypodiaceae). A common fern on exposed hillocks in peninsular hills and in the Himalayas. The fronds (leaves) of this fern when young (in folded state) are used as a vegetable. (Fig. 12).
- Remusatia vivipera* Schott. (Araceae). A bulbous herb found in humid tropical subtropical regions, usually on trees. The leaves are eaten after boiling.
- Rhynchosyche ellipticum* A.DC. (Gesneriaceae). An under-shrubby plant confined to north-eastern region. The leaves are eaten as vegetable.
- Rivea hypocrateriformis* Choisy. Midnapore or clove scented creeper, *phang* (Convolvulaceae). A climbing shrub common throughout India. The leaves and young shoots are boiled with salt and chillies, and used as a vegetable.
- Rodetia amherstiana* Moq. (Amaranthaceae). A shrub found in temperate Himalayas from Kashmir to Kumaon. The young shoots are fried and eaten.
- **Rumex hastatus* D. Don. *Khata-palak* (Polygonaceae). A semi-fleshy herb occurring in the Himalayas. The leaves are used as condiments.
- **R. maritimus* Linn. (Polygonaceae). A herb found in the Himalayas, eastern India and as winter weed in the plains of northern India. The plant is eaten as a pot-herb.

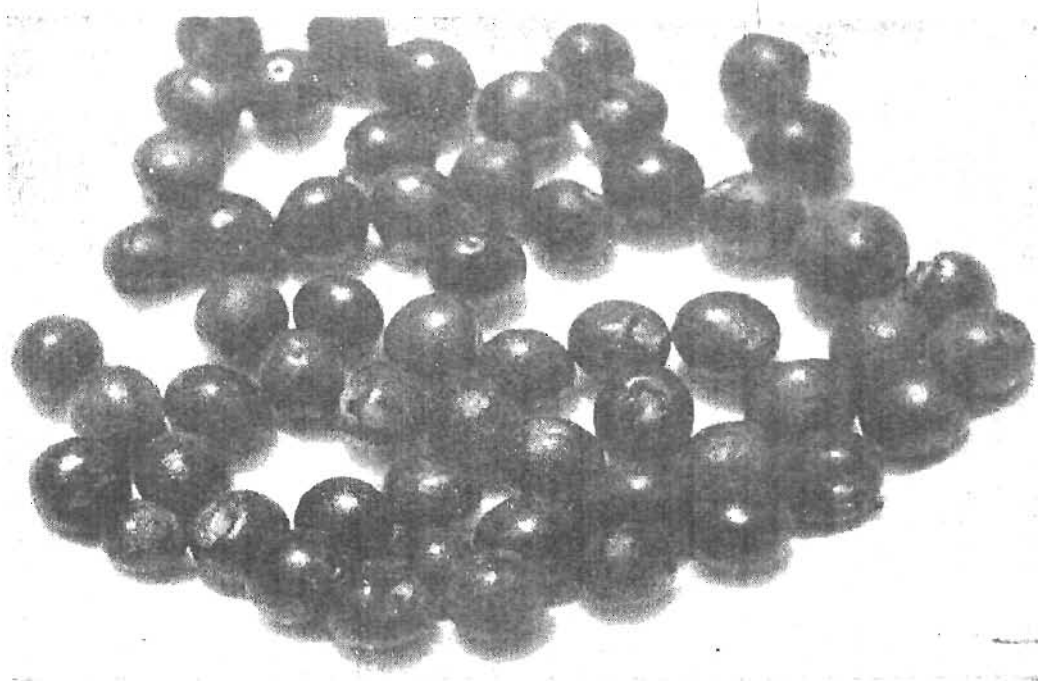


Fig. 21. *Buchanania lanzan*—fruits



Fig. 22. *Carissa congesta*—fruits

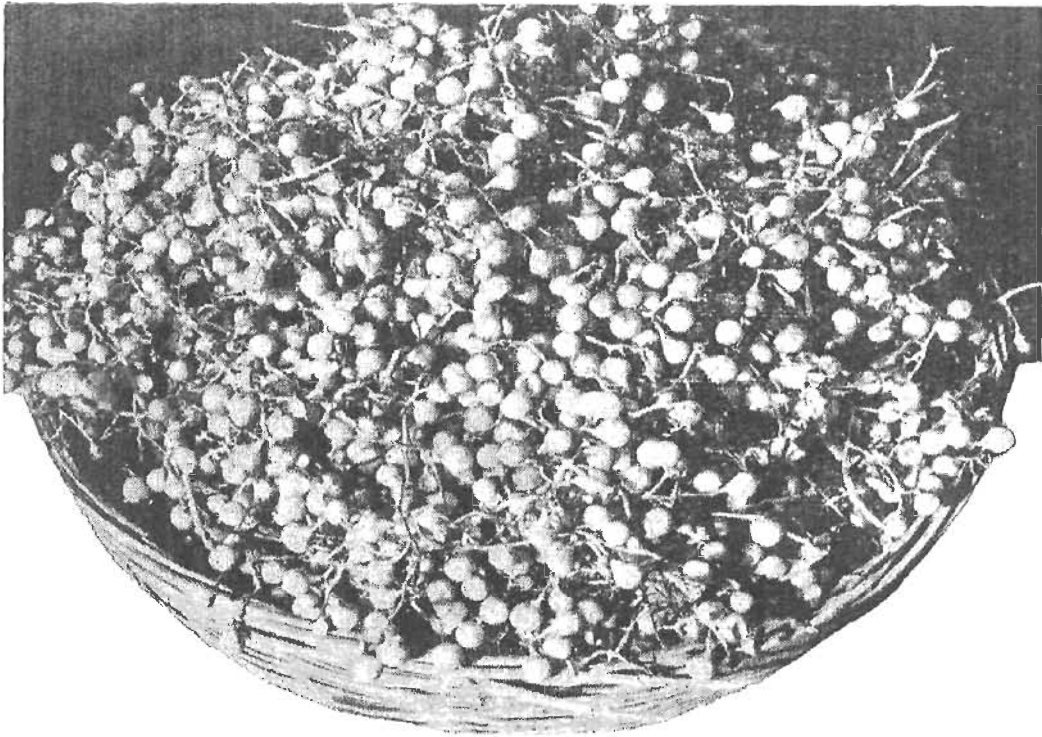


Fig. 23. *Cordia dichotoma*—fruits

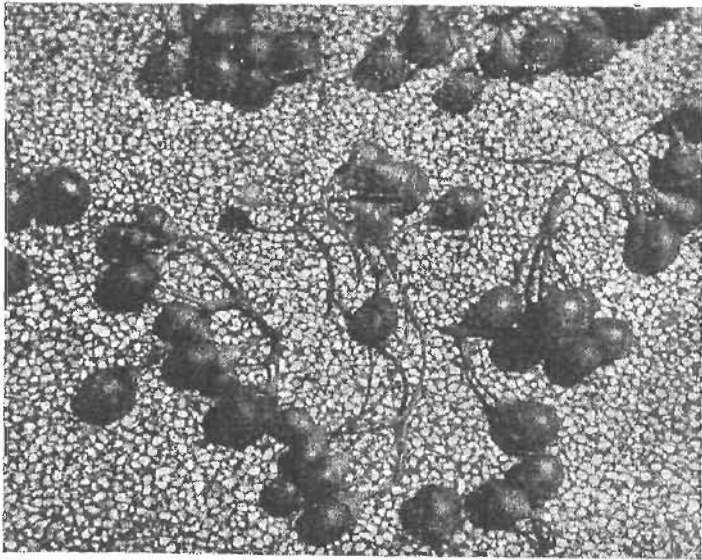


Fig. 24. *Cordia gharaf*—fruits

- **Salicornia brachiata* Roxb. Crab grass, *machul* (Chenopodiaceae). A hardy shrub found in western and eastern peninsula. The young shoots and leaves are eaten as vegetable and also used for pickling.
- **Salsola baryosma* Dandy Syn. *S. foetida* Del. ex Spreng. *loouak* (Chenopodiaceae). A herb of drier tracts. The leaves are used as vegetable.
- S. kali* Linn. Glass-wort, Russian Thistle, *sajji* (Chenopodiaceae). A fleshy herb like above. The leaves are used as a vegetable.
- Salvadora persica* Linn. Salt bush, Mustard tree, *chotu pilu* (Salvadoraceae). A hardy shrub found in drier parts of peninsular India. The leaves are eaten as a vegetable or as salad.
- Sambucus javanica* Bl. (Caprifoliaceae). An ever-green shrub or a small tree of eastern Himalayas and Khasi and adjoining hills. The leaves are used as a vegetable.
- Sarcochlamyx pulcherrima* Gaud. (Urticaceae). A large shrub of north-eastern region. The young shoots are eaten as a vegetable.
- Scaevola taccada* (Gaertn.) Roxb. Syn. *S. koenigii* Vahl (Sonneratiaceae). A tree of tidal sea shores. The leaves are eaten.
- Scorzonera divaricata* Turcz. (Compositae). A herb found in north western Himalayas. The leaves are eaten cooked.
- Scutellaria linearis* Bth. (Labiatae). A herb found in the western Himalayas. The leaves are eaten as a vegetable.
- Sedum rhodiola* DC. (Crassulaceae). A herb found in the western Himalayas. The young leaves of this and of *S. tibeticum*, are eaten in Lahul.
- Sesuvium portulacastrum* Linn. (Aizoaceae). A succulent herb occurring along sea shores. The leaves and twigs are used as spinach.
- Sida veronicaefolia* Lamk. *Bhinli* (Malvaceae). A tall herb common throughout India. The leaves are eaten as pot-herb by Santhals.
- Skimmia laevis* Hk.f. (Rutaceae). An evergreen shrub found in Himalayas and north-eastern hills. The hill tribes eat the leaves in curries, as flavouring agent.
- **Smithia sensitiva* Ait. *odabrini* (Papilionaceae). A much spreading herb occurring in humid tropical tracts, extending to the Himalayas. The leaves are eaten as a pot-herb.
- Solanum crassipetalum* Wall. (Solanaceae). A shrub found in north-eastern hills and eastern Himalayas. The leaves are eaten cooked.
- **S. nigrum* Linn. Black nightshade, *mako* (Solanaceae). A herb found all over India. The leaves and tender shoots are boiled like spinach and eaten.
- S. spirale* Roxb. (Solanaceae). A shrub of north-eastern hills. The leaves are eaten cooked.
- S. trilobatum* Linn. (Solanaceae). An under-shrub confined to western ghats. The leaves are eaten cooked.
- **Sonchus oleraceus* Linn. (Compositae). A tall herb common in north-India, in plains and hills; used by Kashmiris as a vegetable.

- **Stellaria media* (L.) Vill. (Caryophyllaceae). A common winter weed in northern India, also occurring in western and eastern peninsula, and in the Himalayas. The leaves and tender plants are eaten cooked.
- Suaeda maritima* (L.) Dunn. Indian saltwort (Chenopodiaceae). A fleshy herb found along sea coasts and in drier sandy tracts of peninsular India. The fleshy leaves are used as a vegetable.
- S. nudiflora* Miq. Indian saltwort (Chenopodiaceae). A fleshy herb like the above found along sea coasts and in drier sandy tracts. The leaves are used as a vegetable.
- Tamarindus indica* Linn. Tamarind, *imli* (Cecropiaceae). The leaves and new twigs of this tree are used as sour/vegetable and are also sold occasionally for this purpose (seen at Hyderabad).
- Taraxacum officinale* Wigg. Dandelion, (Compositae). A perennial herb mainly found in the Himalayas. The leaves are used as salad and also boiled to be consumed as a vegetable.
- Thymus serpyllum* Linn. Creeping thyme, *ban-ajawain* (Labiatae). An aromatic herb found in western Himalayas. The leaves and twigs are employed as flavouring agent.
- Toddalia asiatica* (L.) Lamk. Syn. *T. aculeata* Pers. Wild orange tree, *kanj*, *lindupara* (Rutaceae). A climbing shrub common in western ghats, north-eastern hills and in lower Himalayas. The leaves are edible.
- Trianthema portulacastrum* Linn. Syn. *T. monogyna* L. Horse purselane, *santhi*, *lalsabuni* (Aizoaceae). A fleshy herb, common as a rainy season weed. The leaves and shoots are eaten as a vegetable. (Fig. 13).
- **Trigonella polycerata* Linn. Wild Fenugreek, *chini*, *chinihari* (Papilionaceae). A sub-erect herb occurring in Himalayas and as a winter weed in plains of northern India. The leaves are used as a vegetable.
- Typha angustifolia* Linn. Cat's tail, Pith grass, *paler* (Typhaceae). A tall grass of wet lands. The young shoots are edible and taste like Asparagus shoots.
- Urtica dioica* Linn. Big Stingnettle, Stinging-nettle, *bichua* (Urticaceae). A perennial herb found in western Himalayas. The young tops are used as a pot-herb.
- **U. hyperborea* Jacq. (Urticaceae). A under-shrub found in higher ranges of western Himalayas. The leaves are eaten dried and stored for winter use in Ladakh where it is called *zakhut*. (Fig. 14).
- U. parviflora* Roxb. (Urticaceae). A under-shrub found in the Himalayas and in Nilgiris. The leaves and swollen nodes are eaten as a pot-herb.
- Vaccinium danianum* Wt. (Vacciniaceae). A small tree found in Khasi and adjoining hills. The leaves are used as a vegetable.
- Vernonia cinerea* Less. (Compositae). A common wasteland plant. The leaves are eaten as a pot-herb.

Wrightia tomentosa Roem. and Schult. (Apocynaceae). A tree found throughout tropical sub-tropical regions of India. The leaves are eaten as a pot-herb by Santhals in Bihar.

Plants mainly used as scarcity or famine foods

- Achyranthes aspera* Linn. (Amaranthaceae)
Adenanthera pavonina Linn. Coral-wood, Bead tree, *Barighunchi* (Caesalpinaceae)
Aerva spp. (Amaranthaceae)
Alternanthera spp. *A. echinata* and others (Amaranthaceae)
Alysicarpus vaginalis DC. (Papilionaceae)
Arthrocnemum indicum Moq. (Amaranthaceae)
Asystasia coromandeliana Nees (Acanthaceae)
Azadirachta indica A. Juss. *Neem* (Meliaceae) tender leaves eaten, rich in iron.
Boerhaavia sp. (Nyctaginaceae)
Buetneria herbacea Roxb. (Sterculiaceae)
Cardiospermum helicacabum Linn. (Sapindaceae)
Cassia spp. (Caesalpinaceae)
Chlorophytum taxum R.Br. Syn. *C. parviflorum* Dalz. (Liliaceae)
Cleome gynandra Linn. Syn. *C. pentaphylla* L. (Capparidaceae)
Cocculus villosus DC. (Menispermaceae)
Commelina spp. (Commelinaceae)
Corbichonia decumbens (Forsk.) Exell. Syn. *Orygia decumbens* Forsk. (Aizoaceae)
Corchorus trilocularis Linn. (Tiliaceae)
Cressa cretica Linn. (Convolvulaceae)
Cyathocline purpurea (Don) Kuntze (Compositae)
Cyperus spp., tender shoots (Cyperaceae)
Dalbergia paniculata Roxb. (Papilionaceae)
Embelia robusta Roxb. (Myrsinaceae)
Erythroxylon monogynum Roxb. (Erythroxylaceae)
Euphorbia spp. herbaceous types, e.g. *E. thymifolia*, *E. hirta*, *E. granulata* (Euphorbiaceae)
Glinus spp. (Aizoaceae)
Glyssocardia bosuallea (Linn.f.) DC. Syn. *G. linearifolia* Cass. (Compositae)
Indigofera spp. mainly herbaceous types like *I. enneaphylla* (Papilionaceae)
Ipomoea spp. (Convolvulaceae)
Justicia procumbens Linn. (Acanthaceae)
Kedrostis rostrata Cogn. (Cucurbitaceae)
Leptadenia reticulata Wt. & Arn. (Asclepiadaceae)
Leucas spp. (Labiatae)
Marsdenia volubilis Cooke (Asclepiadaceae)
Meyna laxiflora Robyns. Syn. *Vangueria spinosa* Roxb. (Rubiaceae)

- Pistia stratioides* Linn. (Araceae)
Pogostemon parviflorus Bth. (Labiatae)
Polygala chinensis Linn. (Polygalaceae)
Porana malabarica Clarke (Convolvulaceae)
Premna spp. (Verbenaceae)
Ranunculus scleratus Linn. (Ranunculaceae)
Rothia trifoliata Pers. (Papilionaceae)
Schrebera swietenoides Roxb. (Oleaceae)
Sida spp. (Malvaceae)
Smilax zeylanica Linn. (Liliaceae)
Solanum surattense Burm. f. Syn. *S. xanthocarpum* Schrad. & Wendl. *Kateli*
 (Solanaceae)
Suaeda spp. (Chenopodiaceae)
Theriophonum dalzellii Schott. (Araceae)
Trianthema decandra Linn. & others (Aizoaceae)
Tribulus spp. (Zygophyllaceae)
Triumfetta rhomboidea Jacq. (Tiliaceae)
Tylophora spp. (Asclepiadaceae)
Typhonium bulbiferum Dalz. (Araceae)
Urginea indica Kunth (Liliaceae)

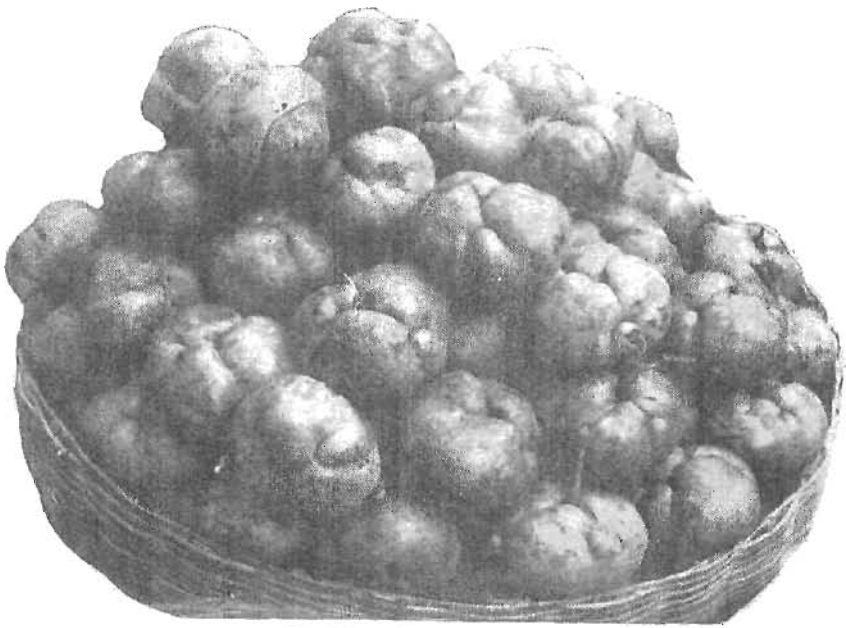


Fig 25. *Dillenia indica*—fruits

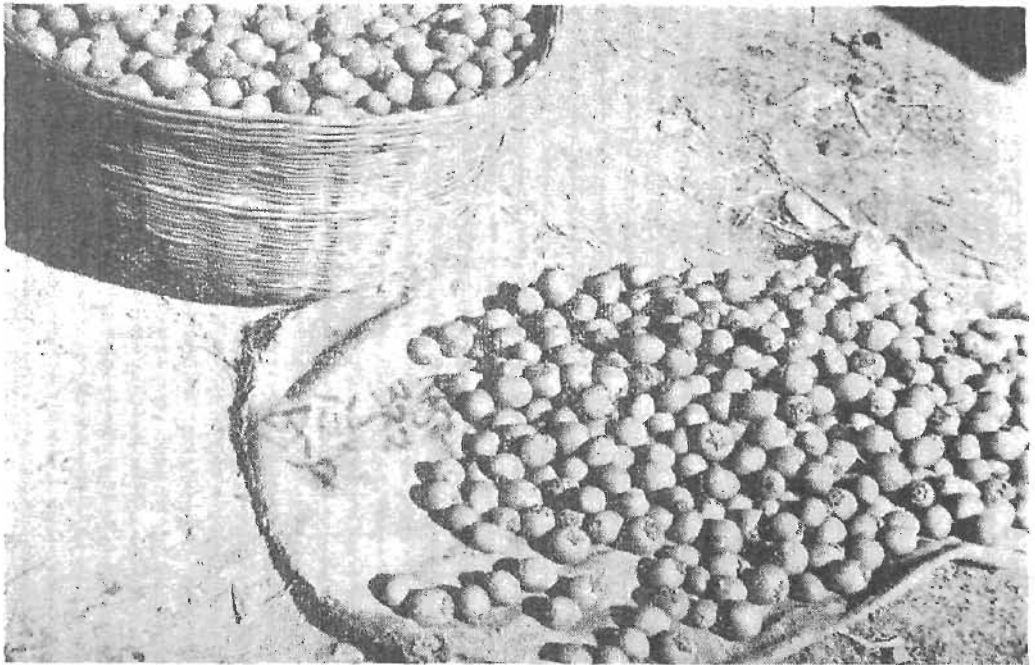


Fig. 26. *Diospyros melanoxylon*—fruits

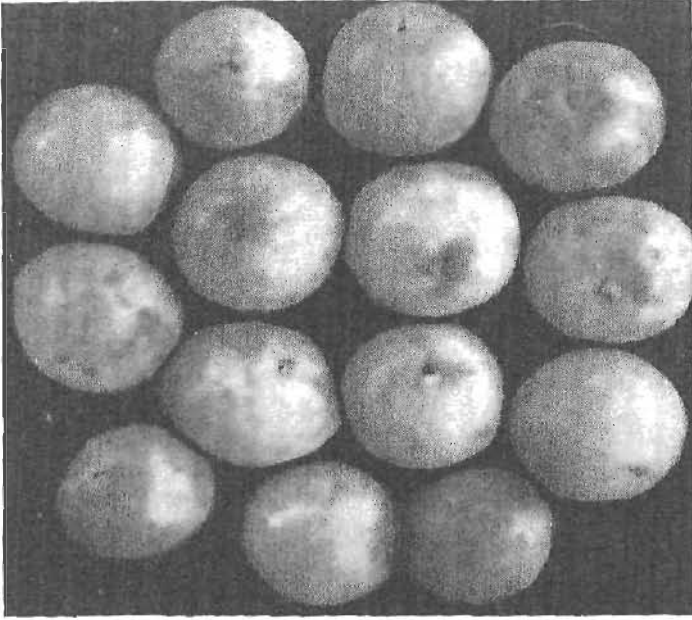


Fig. 27. *Docynia indica*—fruits

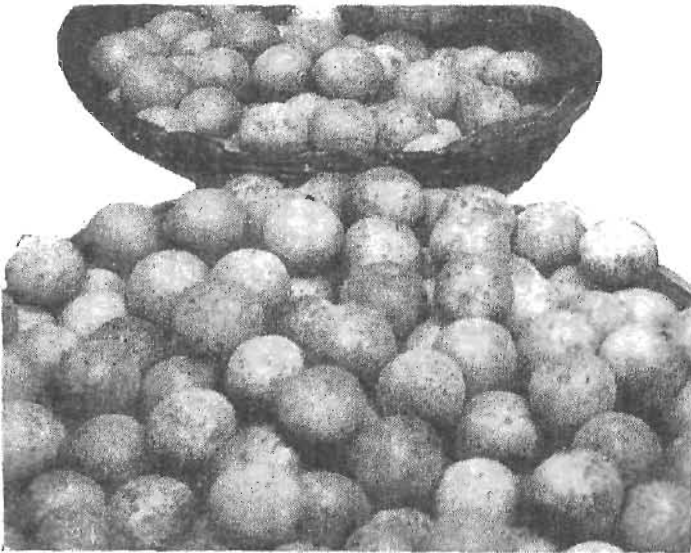


Fig. 28. *Feronia limonia*—fruits

4. PLANTS WITH EDIBLE FLOWERS

A few wild species are important for their edible flowers, buds, inflorescences, etc. Amongst them, it is common to see flower-buds of *Bauhinia* species, particularly *B. variegata* being sold in the local markets. These are eaten cooked as vegetable. In Madhya Pradesh, Bihar, Orissa and adjoining tracts of peninsular India, the tribals collect flowers of *Malu* (*Madhuca indica*) which constitute an important article of food, being eaten raw or cooked. In the drier tracts, sweet flower buds of *Periploca aphylla* are eaten raw or cooked as a vegetable. The flowers of *Capparis decidua* are also used likewise besides being made into pickle. In *Calligonum polygonoides*, the flowers are eaten cooked with oil. In the Himalayas, the sweet calyx of *Astragalus multiceps*, the flowers of *Indigofera desua* and *Polygonum runcinatum* are consumed as vegetable, whereas those of *Cardamine hirsuta* are used as salad.

The flowers of quite a few species find indirect usage in various food-stuffs. Thus, the scarlet flowers of the sub-temperate tree *Rhododendron arboreum* are used in preparing jams and cold drinks. In the eastern peninsular tract, scarlet flowers of *Woodfordia fruticosa* are used in preparing cold drinks. Occasionally, the flower-buds of some plants like *Capparis spinosa* are utilised as condiments. Plants under this category are described below.

Alpinia galanga (L.) Willd. Greater galangal, *kulinjan* (Zingiberaceae). A perennial herb occurring in the humid tropical areas of western and eastern peninsula extending northwards to lower Himalayas. The flowers are eaten raw.

Ardisia griffithii C.B. Clarke (Myrsinaceae). An evergreen shrub found in Khasi hills and in adjoining tract. The flowers are eaten cooked and taste like fish.

Astragalus multiceps Wall. (Papilionaceae). A shrub found in western Himalayas. The sweet calyx is eaten.

Bambusa bambos (L.) Voss. Syn. *B. arundinacea* Willd. Thorny bamboo, *bans* (Gramineae). A tall clumpy bamboo found in tropical-subtropical regions, except in dry areas. Young buds are used as a vegetable.

Bauhinia purpurea Linn. Pink Bauhinia, *lal kachnar* (Caesalpiniaceae). A small tree widely distributed in tropical and sub-tropical parts of the country except in arid region. The flower buds are used as vegetable.

**B. variegata* Linn. Mountain ebony, Variegated bauhinia, *kachnar* (Caesalpiniaceae). A medium tall tree occurring in the northern hills eastwards to north-eastern region, and in western peninsula. The flower buds are eaten as a vegetable. (Fig. 15).

- Bombax ceiba* Linn. Syn. *Bombax malabaricum* DC. Silk Cotton Tree, *simul* (Bombacaceae). A tall deciduous tree found wild in hotter dry-humid tropical-subtropical tracts of peninsular India. The flower buds, as also fleshy calyx is edible.
- **Calligonum polygonoides* Linn. (Polygonaceae). A shrub of arid regions found in Rajasthan and adjoining tract. The flowers are eaten cooked with oil. They are also made into a bread.
- **Capparis decidua* (Forsk.) Pax Syn. *C. aphylla* Roth, *karil* (Capparidaceae). A leafless hardy arid zone bush, met with in hotter parts of India. The flowers and buds are eaten as vegetable or preserved as pickle.
- C. spinosa* Linn. Caperbush, *kabara*, *kalvari* (Capparidaceae). A hardy shrub found in hotter parts of north-western region, extending southwards. The flower buds are used as condiments.
- Cardamine hirsuta* Linn. var. *sylvatica* Hook.f. and Thoms. Bitter cress (Cruciferae). A herb of temperate tracts; also occurring as winter weed in Bengal. The flowers are used as *salad*.
- Caryota urens* Linn. Toddy palm, *mari*, Ramgoah (Palmeae). A tall palm occurring mainly in humid parts of peninsular region. The cabbage or terminal bud is edible. It is eaten raw or cooked as a vegetable or even pickled.
- Cassia siamea* Lamk. *Kassod* (Caesalpiniaceae). A tree found mainly in western peninsula. The flowers are eaten.
- Clerodendrum serratum* Spr. *Bharangi* (Verbenaceae). A small shrub occurring throughout India chiefly in humid tracts, extending to lower Himalayas. The flowers are used as a vegetable.
- Corypha elata* Roxb. Buri palm, *bajur* (Palmeae). A tall palm occurring in humid parts of Bengal and in Andaman Islands. The buds are used as vegetable.
- Dichopsis polyantha* Bth. & Hk.f. (Sapotaceae). An evergreen tree found in north-eastern hills. The flowers are eaten.
- **Dillenia indica* Linn. Elephant apple, *chalta* (Dilleniaceae). A tall evergreen tree of humid tropical habitat found mainly in western, eastern, and northern hills. The flowers are eaten. (Fig. 25).
- D. pentagyna* Roxb. *Karmal* (Dilleniaceae). A tall deciduous tree found in tropical—subtropical forests throughout India. The flowers are eaten.
- Dioscorea pentaphylla* Linn. *Kanta alu* (Dioscoreaceae). A climber found throughout India except in dry region; more common in humid tropical tracts. The flower buds especially the staminate, are used as a vegetable.
- Ensete superbum* (Roxb.) Cheesman Syn. *Musa superba* Roxb. (Musaceae). A banana-like herb found in humid tropical region. The buds and inflorescences are eaten as a vegetable.

- Eugenia formosa* Wall. (Myrtaceae). An evergreen tree found in north-eastern hills. The calyx is eaten cooked.
- Holostemma annularis* (Roxb.) K. Sch. Syn. *H. rheedii* Wall. *Chirvel* (Asclepiadaceae). A shrub occurring throughout India. The flowers are eaten as a vegetable.
- Indigofera dosua* Buch.-Ham. *Khenti*, *shagali* (Papilionaceae). A shrub found in western Himalayas, extending eastwards to Assam hills. The flowers are eaten as a vegetable.
- I. pulchella* Roxb. *Rakna*, *sakena* (Papilionaceae). A shrub found throughout peninsular region, extending to sub-Himalayan tract. The pink flowers are used as a vegetable.
- **Madhuca indica* Gmel. Syn. *Bassia latifolia* Roxb. Mahua tree, Illipe butter, *mohua*, *mohwa* (Sapotaceae). A tall tree common in peninsular India. The flowers (sweet succulent Corolla) are eaten raw or cooked and even made into sweet meats, also brewed into a local beer, much consumed by the tribals. (Fig. 16).
- M. malabarica* (Bedd.) Parker Syn. *Bassia malabarica* Bedd. (Sapotaceae). A tall evergreen tree found in humid parts of western ghats. The flowers are eaten.
- Monochoria hastaeifolia* Presl. (Pontederiaceae). An aquatic herb found throughout India along margin of ponds and marshy lands. The inflorescence is eaten.
- **Nelumbo nucifera* Gaertn. Syn. *Nelumbium speciosum* Willd. Lotus, *kanwal* (Nymphaeaceae). An aquatic herb found throughout India in ponds. The flowers (often buds) are eaten. (Fig. 17).
- Nymphaea nouchali* Burm. f. Syn. *N. lotus* Hook. f. & Th. White Lotus, *kamalakakri* (Nymphaeaceae). An aquatic herb occurring in ponds throughout India. The flowers are edible.
- N. tetragona* Georgi Syn. *N. pygmaea* Ait. Pigmy water lily (Nymphaeaceae). An aquatic herb occurring in Himalayas eastwards to Khasi hills. The buds are eaten.
- Orthanthera viminea* Wt. & Arn. *Mahur-ghas* (Asclepiadaceae). A leafless shrub found in hotter parts of northern India, Rajasthan and in the Himalayan foothills. The flower buds are eaten as a vegetable.
- Periptoca aphylla* Decne (Asclepiadaceae). A hardy shrub chiefly found in drier parts of northern-north-western India. The sweet flower-buds are eaten raw or cooked as vegetable.
- Polygonum runcinatum* Buch.-Ham. Syn. *P. sinuatum* Royal ex Bab. (Polygonaceae). A creeping herb occurring in the Himalayas from Kashmir eastwards to Khasi hills. The flowers are eaten.
- **Rhododendron arboreum* Sm. *Bras* (Ericaceae). A handsome tree occurring in temperate Himalayas and higher hills of western ghats and north-

eastern India. The large scarlet flowers are used in preparing jams and cold drinks.

Vaccinium serratum Wt. (Vacciniaceae). A shrub found in north-eastern hills. The sour flowers are eaten in curries in Garo hills.

Woodfordia fruticosa (L.) Kurz Syn. *W. floribunda* Salisb. *Dhawi, dhauta, tenka* in Orissa (Lythraceae). A shrub common in peninsular tracts of India. Because of the honey-like secretion the flowers are eaten. They are also used in preparing cool drinks.

Mainly used as scarcity or famine foods

Bambusa spp. (Gramineae). leaf buds

Bauhinia racemosa Lamk. *Gurial, kachnar* (Caesalpiniaceae); flowers

Boswellia serrata Roxb. ex. Colebr. Indian Frankincense, *salai* (Burseraceae)

Cassia fistula Linn. Indian Laburnum, *amaltas* (Caesalpiniaceae); flowers

Ficus spp. (Moraceae); young buds

Musa ornata Roxb. (Musaceae); young buds

Mussaenda frondosa Linn. (Rubiaceae); flowers

Phoenix spp. (Palmeae); leafy buds

Pterocarpus marsupium Roxb. Indian kino tree, Malabar kino, *bijasar, pitasara* (Papilionaceae); flowers

Wrightia tinctoria R.Br. (Apocynaceae); flowers

5. PLANTS WITH EDIBLE FRUITS

THE edible wild fruits occurring in different forest tracts of the Indian sub-continent, botanically come from widely different families. In all about 300 kinds are known, of which about 50 are more agreeable. Because of the great climatic and physiographic diversity, the Himalayan region has a different wealth of wild fruit plants than the peninsular tropical-subtropical parts of the country. The edible kinds here are chiefly from the Rosaceae, Saxifragaceae, Cornaceae, Caprifoliaceae and Berberidaceae. In contrast the wild fruits of tropical-subtropical tracts are mainly from the Anacardiaceae, Annonaceae, Guttiferae, Tiliaceae, Elaeocarpaceae, Elaeagnaceae, Vitaceae, Myrtaceae, Euphorbiaceae, Moraceae, Rutaceae, and Rhamnaceae. The availability of these kinds varies in different regions. While some are widely distributed other types are localized. Thus in the semi-arid to arid tracts of Rajasthan, the adjoining areas of northern India and in the Deccan plateau, the common fruits met with chiefly in scrub jungles are of species of *Capparis*, *Grewia*, *Zizyphus*, *Rhus*, *Carissa*, *Flacourtia* and *Salvadora*; whereas in the humid areas as of western ghats, parts of eastern ghats and the north-eastern hills, edible kinds in *Solanum*, *Garcinia*, *Elaeocarpus*, *Citrus*; *Elaeagnus*, *Mangifera*, *Syzygium* and *Vitis* are prominent in the ever-green forests. A different kind of variety prevails in the warm-cold temperate Himalayan belt with edible types of *Dacrydium*, *Ribes*, *Pyrus*, *Prunus*, *Sorbus*, *Berberis*, *Cornus*, *Rubus*, *Fragaria*, *Crataegus*, *Viburnum* and *Vaccinium*. Further, while some kinds occur commonly throughout the country like *Aegle marmelos*, *Emblica officinalis*, *Feronia limonia*, *Syzygium cumini* and *Alangium salvifolium*, others are endemic to certain regions e.g., *Rhodomyrtus parviflora* in Nilgiris (western ghats), *Hippophae* spp. in Himalayan tract; *Alphonsea ventricosa*, *Fissistigma verrucosum* and *Mangifera sylvatica* in north-eastern hills; and *Garcinia hombroniana* in the Nicobar Islands.

Majority of these wild fruits are eaten raw when ripe. It is the sweetish pulp or the fleshy palatable pericarp of the ripe berries or drupes that is generally consumed e.g., in *Zizyphus nummularia*, *Carissa congesta*, *Elaeagnus* spp., *Elaeocarpus* spp., *Vitis* spp., *Grewia* spp., and others. Occasionally, the edible part is the fleshy aril as in *Euphoria longan* and *Horsfieldia anygdalina* or the succulent peduncle or inflorescence e.g., in *Morus* spp., and *Hovenia dulcis*. Apart from being eaten raw, the natives often cook some of the wild kinds into vegetables, e.g., in *Elaeocarpus*, *Gardenia*, *Mucuna*, *Solanum* and others. In contrast, the immigrant habitants consume many of these wild fruits by making preserves of varied kinds. Thus the fruits of *Capparis*, *Cordia*, *Carissa*, *Commiphora*, *Elaeagnus*, *Artocarpus*, *Mangifera*, *Elaeocarpus* and *Citrus* are often pickled; those of *Citrus*, *Hippophae* and *Crataegus* are made into marmalades; jams, tarts and jellies are prepared out of the sweetish to sub-

acidic pulp of the fruits of *Carissa*, *Elaeagnus*, *Garcinia*, *Flacourtia*, *Rhodomyrtus*, *Rubus*, *Mangifera* and *Syzygium* species. Occasionally, cooling drinks are prepared by mixing the pulp of the ripe fruits of *Aegle marmelos*, *Feronia limonia*, *Garcinia* spp., *Myrica nagi* and *Dillenia indica*; and a few kinds may even be utilised for brewing purposes e.g., *Prunus cornuta* and *Elaeagnus angustifolia*.

Not much is known about the nutritive value of the wild edible fruits. The available information has been synthesized here (Table 3), and this indicates that some of these fruits are rich in proteins, minerals and carbohydrates e.g., *Aegle marmelos*, *Carissa congesta*, *Erycibe wightiana*, *Ficus* spp., and *Zizyphus rugosa*; particularly the fruits of *Erycibe wightiana*, *Gardenia latifolia*, *Feronia limonia*, *Carissa congesta*, *Ficus*, spp., and *Zizyphus rugosa* are seen to be rich in proteins; those of *Spondias pinnata*, *Ficus* spp., *Feronia limonia*, *Carissa congesta* and *Gardenia latifolia* in fats, whereas the mineral content is found to be more in *Carissa congesta*, *Zizyphus rugosa* and *Ficus* species.

Further analysis (refer Aykroyd, 1956) points out that the fruits of *Spondias pinnata* and *Artocarpus lakoocha*, are rich in vitamin A and those of *Embllica officinalis*, *Crataegus oxyacantha* and *Hippophae rhamnoides* in vitamin C. As for minerals, iron content is high in *Rubus fruticosus*, *Spondias pinnata*, and *Carissa congesta*; potassium in *Aegle* and *Rhodomyrtus*; phosphorus in *Flacourtia indica*, *Feronia limonia* and *Zizyphus rugosa*; and calcium in *Carissa congesta*, *Zizyphus rugosa*, *Erycibe wightiana*, *Feronia limonia* and *Flacourtia indica*. Plants under this category are described below.

(a) Ripe fruits

Actinidia callosa Lindl. (Ternstroemiaceae) An evergreen climbing shrub occurring mainly in north-eastern hills. The soft, acidic pulp in the berries is edible.

**Aegle marmelos* (L.) Correa. Bengal quince, *bael* (Rutaceae). A deciduous tree distributed throughout India. The large apple-size fruits possess aromatic pulp which is eaten as such or with water and sugar as a drink. (Fig. 18).

Aglaiia edulis A. Gray (Meliaceae). An evergreen tree found in north-eastern hills. The large succulent aril is sweet.

A. elaeagnoides Benth. Syn. *A. roxburghiana* Miq. (Meliaceae). A small evergreen tree found mainly in the western peninsula. The ripe fruit is with edible pulp.

Alangium salvifolium (Linn.f.) Wang. Syn. *A. lamarckii* Thw. Sage-leaved Alangium, *dhera*, *akola* (Alangiaceae). An evergreen shrub or a small tree found mainly in the drier parts of peninsular India. The red pulp in the ripe berries is edible.

Alphonsea lutea Hk.f. and Thoms. (Annonaceae). A small evergreen tree

found in north-eastern hills. The ripe fruit is with edible aromatic creamish pulp.

- A. ventricosa* Hk.f. and Thoms. (Annonaceae). A tall evergreen tree of north-eastern hills. The edible part is the aromatic yellowish pulp.
- Ampelocissus arnotiana* Planch Syn. *Vitis indica* Linn. Indian wild vine, *jangli angur* (Vitaceae). A climber found in humid tropical tracts. The edible berries are purple.
- A. barbata* Wall. Syn. *Vitis barbata* Wall. (Vitaceae). A woody climber found in north-eastern hills. The berries are sweet and palatable like grapes.
- A. latifolia* (Roxb.) Planch. Syn. *Vitis latifolia* Roxb. *Panibel* (Vitaceae). A huge climber occurring mainly in the western ghats and north-eastern hills. The edible berries are blackish-purple.
- A. rugosa* Planch. Syn. *Vitis rugosa* Wall. (Vitaceae). A tall climber found mainly in north-eastern Himalayan region. The black berries possess sub-acidic pulp.
- Annona* spp. (Annonaceae). Both *A. squamosa* and *A. reticulata* are known to occur in naturalized state especially in western and southern India.
- Anthocephalus indicus* A. Rich. *Kadam, kadamba* (Rubiaceae). A tall tree wild along the western ghats humid tract. The edible yellow fruit is of the size of a small orange.
- Antidesma acuminatum* Wall. (Euphorbiaceae). An evergreen shrub found mainly in eastern tract. The small pisiform fruits are with blackish pulp.
- A. bunius* (L.) Spr. Chinese Laurel, *amati, himalcheri* (Euphorbiaceae). An evergreen shrub or a small tree occurring in the humid western, eastern and north-eastern region. The pisiform fruits are with blackish edible pulp.
- A. diandrum* Roth (Euphorbiaceae). A shrub or a small tree found in peninsular region, extending to the sub-Himalayan tract. The purple pisiform fruits are acidic.
- A. ghesaembilla* Gaertn. Black Currant, *umtao* (Euphorbiaceae). A shrub found in the peninsular region, extending to Assam and adjoining hills. The pisiform edible drupes are purple-black.
- A. khasianum* Hk.f. (Euphorbiaceae). A shrub or a small tree found in north-eastern hills. The fruits turn blackish on ripening and possess scanty edible pulp.
- Aphania rubra* Radlk. (Sapindaceae). An evergreen shrub found in north-eastern hills. The edible drupes are purple.
- Aporosa roxburghii* Baill. (Euphorbiaceae). An evergreen tree found in Orissa and north-eastern region. The fruit-aril is acidic.
- Artisia floribunda* Wall. (Myrsinaceae). An evergreen shrub or small tree found in north-eastern hills. The edible berries are purplish.

- A. polycephala* Wall. (Myrsinaceae). An evergreen shrub occurring in north-eastern hills. The ripe berries are edible.
- **Artocarpus heterophyllus* Lamk. Syn. *A. integrifolia* Linn. Jack fruit tree, *kathal* (Moraceae). A tall evergreen tree wild in the western ghats. The large globose to elongated fruits possess sweet creamish-yellow pulp. It is also cultivated. (Fig. 19).
- A. hirsuta* Lamk. (Moraceae). A tall evergreen tree found mainly in the western ghats. The ripe fruit is with edible, creamish pulp.
- **A. lakoocha* Roxb. Monkey jack, *berhal* (Moraceae). A tall evergreen tree found in humid tracts of peninsular India and in sub-Himalayan region. The edible pulp in the ovoid, apple-size fruits is sweet. (Fig. 20).
- Azima tetracantha* Lamk. *Sakapat* (Salvadoraceae). A spiny bush mainly occurring in western peninsula. The pisiform edible berries are whitish and pulpy.
- Baccaurea courtallensis* Muell.-Arg. (Euphorbiaceae). A tall deciduous tree found mainly in the western peninsula. The succulent aril in the ripe fruit is eaten.
- B. sapida* Muell.Arg. *Lotkua* (Euphorbiaceae). A tall tree found in eastern India, sub-Himalayan tract and in Andaman Islands. The pulp in the ripe fruit is delicious.
- Berberis aristata* DC. The Indian barberry, *rasaut*, *daruhalli*, *dar-hald*. (Berberidaceae). A shrub found mainly in the Himalayas and in the Nilgiris. The small dried berries are consumed.
- B. asiatica* Roxb. (Berberidaceae). A shrub found in the dry valleys in the Himalayas and in peninsular hilly tract. The dried berries are consumed like raisins and are palatable.
- B. vulgaris* Linn. *Chatroa*, *kashmol* (Berberidaceae). A shrub found in north-eastern Himalayas. The dried berries are edible.
- Bridelia squamosa* Gaertn. Syn. *B. retusa* Spr. *Ekdania* (Euphorbiaceae). A deciduous tree found in hotter parts throughout India. The drupes possess juicy pulp.
- B. stipularis* Bl. (Euphorbiaceae). A scandent shrub found throughout India particularly in dry forests, up to the sub-Himalayan tract. The ripe drupes are bluish-black and juicy.
- Buchanania angustifolia* Roxb. Buchanan mango, Cuddapah almond, *piyala*, (Anacardiaceae). A tall tree mainly occurring in western peninsula. The ripe fruits are eaten.
- B. lancifolia* Roxb. (Anacardiaceae). A tree found in eastern India along coast and in Andaman Islands. The ripe fruits are eaten.
- **B. lanzan* Spr. Syn. *B. latifolia* Roxb. Cuddapah almond, *chironji*, *chivoli* (Anacardiaceae). A tall tree common in peninsular tracts of India. The dark coloured ripe fruit is eaten. (Fig. 21).



Fig. 29. *Ficus glomerata*—fruits

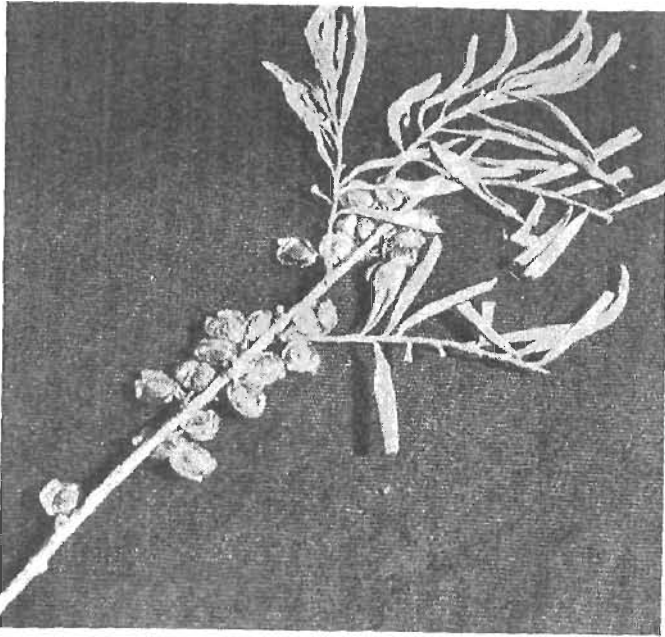


Fig. 30. *Hippophae* sp. (*rhomboides*)—a twig in fruit

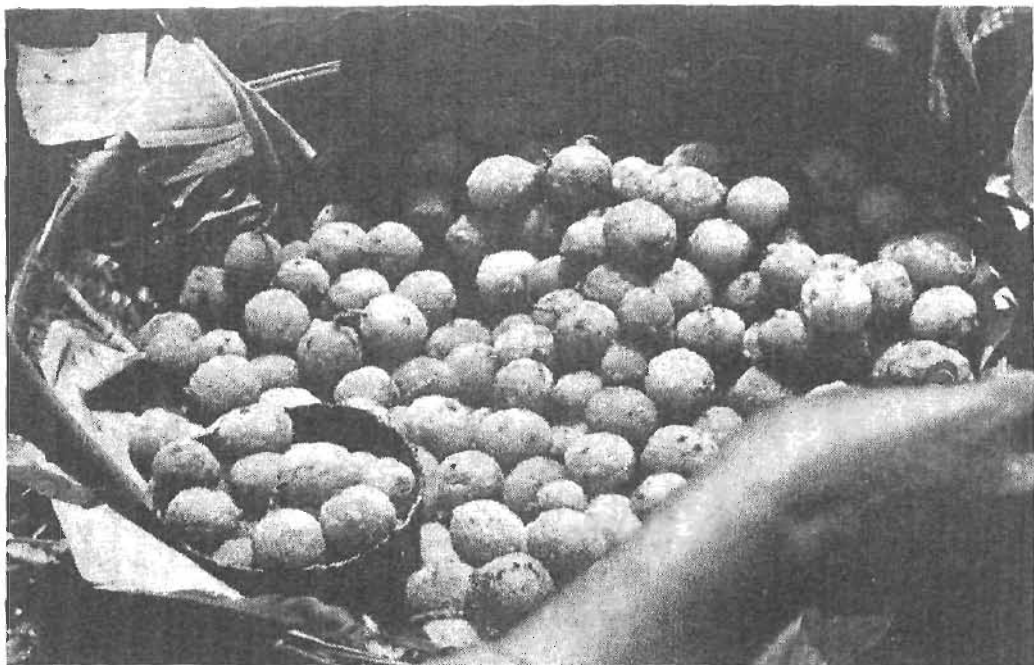


Fig. 31. *Myrica nagi*—fruits



Fig. 32. *Prunus* sp. (*jenkinsii*)—fruits

- Calamus rotang* Linn. Rattan, *bet*, *vetasa* (Palmeae). A tall cane found in humid tracts of central and southern India. The fleshy substance surrounding the seeds forms the edible part.
- Calophyllum apetalum* Willd. Syn. *C. wightianum* Wall. *Poon*, *bobbi*, (Guttiferae). An evergreen tree found in western ghats. The fruits are red and sweet.
- Canthium dicoccum* ((Gaertn.) Merr. Syn. *C. umbellatum* Wt. (Rubiaceae). A small evergreen tree mainly found in western peninsula. The small ovoid fruits are black when ripe.
- C. parviflorum* Lamk. (Rubiaceae). An evergreen shrub found in the western peninsula. The sweetish fruits turn yellow on maturity.
- **Capparis decidua* (Forsk.) Pax Syn. *C. aphylla* Roth, *karir* (Capparidaceae). A hardy bush found in drier tracts throughout India. The ripe red berries are edible raw though they are generally pickled.
- C. zeylanica* Linn. *Hirs*, *gitoran* (Capparidaceae). A thorny shrub found throughout India. The pulp in the red berries is eaten.
- Carallia brachiata* (Lour.) Merr. Syn. *C. integerrima* DC. *Kierpa* (Rhizophoraceae). A tall tree found in the humid tracts of western and eastern India and in Andaman Islands. The reddish fruit is with scanty edible pulp.
- **Carissa congesta* Wt. Syn. *C. carandas* Linn. *Karonda* (Apocynaceae). An evergreen thorny shrub found throughout India, commonly in hotter, humid areas. The ripe purple-black berries are sweet and eaten raw or made into preserves, jams, tarts. (Fig. 22).
- C. inermis* Vahl, *karonda* (Apocynaceae). An evergreen shrub found in western peninsula. The small purple berries are sweet and eaten raw.
- C. paucinervis* DC. (Apocynaceae). An evergreen shrub, occurring in higher hills of western ghats and in eastern India. The ripe purple berries are with sub-acidic pulp.
- C. spinarum* Linn. *Karonda* (Apocynaceae). An evergreen shrub found in dry tracts throughout India. The red berries are sweet and taken raw or made into tarts.
- Cayratia tenuifolia* Gagnep Syn. *Vitis tenuifolia* Wt. and Arn. (Vitaceae). A climber found in the humid tracts of tropical, sub-tropical India. The edible berries are creamish and pulpy.
- Celtis australis* Linn. Nettle tree, Hackberry, *brenji* (Ulmaceae). A tree found in the western Himalayas eastwards to Khasi hills. The fruit is with sweetish pulp. Another Himalayan species, *C. canescica* also possesses edible fruits.
- Citrus hystrix* DC. (Rutaceae). An evergreen tree found in north-eastern hills. The aromatic, acidic juicy fruit is of lime size.
- C. medica* Linn. (Rutaceae). An evergreen tree found in north-eastern hills.

The large orange-size berries with juicy acidic pulp are eaten. The peel and pulp is also made into preserves and marmalades.

Clausena dentata (Willd.) Roem. and Schult. Syn. *C. willdenowii* Wt. & Arn. (Rutaceae). An evergreen shrub found in the humid tracts of eastern and western peninsula and north-eastern hills. The pulp in berries has the flavour like that of black currant.

**Cordia dichotoma* Forst.f. Syn. *C. myxa* Linn. Sebasten, *lasora*, *chokargond* (Boraginaceae). A deciduous tree found throughout the warmer parts of India, up to lower hills of the Himalayas. The mucilaginous pulp of ripe brownish-yellow drupes is sweet. (Fig. 23).

**C. gharaf* (Forst) Ehrenb. and Asch. Syn. *C. rothii* Roem and Schult. *Gondi* or *gondri* (Boraginaceae). A deciduous tree found in the sub-Himalayan tract and in central India. The brownish ripe drupes are with gelatinous sweet pulp. (Fig. 24).

Coriaria nepalensis Wall. *Makola* (Coriariaceae). A shrub found in north-eastern hills and eastern Himalayas. The fruits are rather insipid but edible.

**Cornus capitata* Wall. ex Roxb. *Tharmal* (Cornaceae). An evergreen shrub or a small tree found in western Himalayas eastwards to north-eastern hills. The pea-size succulent fruits are sweetish and eaten raw or made into preserves.

C. macrophylla Wall. *Kandar*, *kachar* (Cornaceae). An evergreen small tree found in western Himalayas, eastwards to Manipur. The black ripe fruits are eaten raw.

**Crataegus oxyantha* Linn. (Rosaceae). A shrub found in the Himalayas. The acidic fruits are eaten and made into preserves.

Cudrania javanensis Trecul. *Manda*, *mangei*, *kamgu* (Moraceae). A scandent spiny shrub found in the sub-Himalayan tract eastwards to Khasi hills and also in Orissa. The fruit is pulpy and orange-purple.

Curculago latifolia Dry. (Amaryllidaceae). A shrub found in Andaman Islands. The fruit is eaten.

Cyathocalyx martabanicus Hk.f. & Thoms. (Annonaceae). An evergreen tree found in north-eastern hills. The ripe fruit is with sweetish aromatic pulp.

Debregeasia hypoleuca Wedd. *Sansaru* (Urticaceae). An evergreen shrub found in western Himalayas from Kashmir to Kumaon. The small pea-size fruits with yellow sweetish-pulp are taken raw, and also used for flavouring.

D. longifolia Wedd. (Urticaceae). A shrub found in the sub-Himalayan tract, in the hills of western ghats eastwards to Khasi hills and other regions. The edible fruit is orange-yellow resembling a small raspberry.

- Decaisnea insignis* Hk.f. and Thoms. (Lardizabalaceae). A shrub found in the Himalayas. The large berries are edible.
- Dillenia aurea* Sm. (Dilleniaceae). A shrub found in north-eastern hills and in the Andaman Islands. The apple-size fruit is used as seasoning material.
- **D. indica* Linn. *Chalta* (Dilleniaceae). An evergreen tree found in eastern and western peninsula, north-eastern region and in the lower Himalayas. The fleshy pulp of the ripe yellowish fruits is consumed. The acidic pulp is also sweetened with sugar and taken as cooling drink. (Fig. 25).
- D. pentagyna* Roxb. *Karmal* (Dilleniaceae). A deciduous tree found throughout India. The fruit is much smaller than *chalta*, and is eaten raw or cooked.
- D. scabrella* Roxb. (Dilleniaceae). A deciduous tree found in north-eastern India. The small globose berries are eaten.
- **Diospyros chloroxylon* Roxb. Green ebony persimmon (Ebenaceae). A tree found chiefly in the peninsular region. The ripe fruit is palatable.
- D. ebenum* Koenig. *Ebans*, *abmus* (Ebenaceae). A tree confined to western ghats. The fleshy fruit is eaten.
- **D. exsculpta* Buch.-Ham. Syn. *D. tomentosa* Roxb. Nepal ebony persimmon, *kendu* (Ebenaceae). A tree commonly found in peninsular tracts. The ripe yellow fruit has sweetish pulp.
- D. ferra* (Willd.) Bakh. Syn. *Maba buxifolia* Pers. (Ebenaceae). A tree found in the forests of Orissa and in western peninsula. The fruit is pulpy.
- D. kaki* Linn.f. Japanese persimmon. *Halwa tendu* (Ebenaceae). An evergreen tree found wild in North-eastern hills, elsewhere cultivated. The orange red fruit is with sweetish pulp.
- D. lanceaefolia* Roxb. (Ebenaceae). A tree found in north-eastern hills. The pulp in the ripe fruit though astringent is eaten.
- **D. lotus* Linn. Dateplum persimmon, *amlot* (Ebenaceae). An evergreen tree found in north-eastern hills. The sweetish pulp in ripe fruit is eaten, and is also sometimes used in the preparation of sharbats. The dried fruit is consumed and also cultivated.
- D. melanoxylon* Roxb. Coromandal ebony persimmon, *tendu* (Ebenaceae). A tree chiefly of peninsular dry-forest tracts. The ripe fruit is pale yellow and pulpy. (Fig. 26).
- D. montana* Roxb. (Ebenaceae). A tree found mainly in peninsular tract. The edible fruit is pulpy and brownish.
- D. peregrina* (Gaertn.) Gurkè Syn. *D. embryopteris* Pers. Indian persimmon, *Gab.* (Ebenaceae). An evergreen tree found throughout India, often along wet places. The globose peach-size fruit is pulpy and sweetish.
- D. pyrrocarpa* Miq. (Ebenaceae). A tree found in the Andaman Islands. The fruits are eaten.

- D. ramiflora* Roxb. (Ebenaceae). A tree found in West Bengal and north-eastern region. The fruits are eaten.
- D. sylvatica* Roxb. (Ebenaceae). An evergreen tree found in south India and Orissa. The ripe fruit is with sweetish pulp.
- D. toposia* Buch.-Ham. Syn. *D. racemosa* Roxb. (Ebenaceae). A tree found in eastern and western ghats. The ripe fruit is pulpy and edible.
- Diplokuema butyracea* (Roxb.) H.J. Lam. Syn. *Bassia butyracea* Roxb. *Phalwara*, *chiura* (Sapotaceae). A tree found in the sub-tropical Himalayas, and in Konkan and Bihar. The black ripe berries possess sugary pericarp.
- **Docynia hookeriana* Decne (Rosaceae) An evergreen tree found in north-eastern hills. Its fruit is of the size of a small apple and is sour. It is eaten raw and also used for making tarts.
- **D. indica* Decne. Indian crab apple (Rosaceae) An evergreen tree found mainly in north-eastern India. The fruit has a quince-like flavour and is eaten raw. (Fig. 27).
- **Donella roxburghii* (G. Don) Pierre ex Lacomte Syn. *Chrysophyllum roxburghii* G. Don (Sapotaceae). A tall evergreen tree found in the western ghats and north-eastern hills. The ripe plum-size fruit is pulpy, sweet and edible.
- Dracontomelum puberullum* Miq. Syn. *D. mangiferum* Miq. (Anacardiaceae). A tree found in the Andaman Islands. The yellowish plum-size fruit is eaten.
- Duabanga sonneratioides* Buch.-Ham. Syn. *D. grandiflora* Walp. *Lampatti*, *bandorhulla* (Lythraceae). A tall tree of north-eastern hills, Andaman and Nicobar Islands. The fruit is with acidic pulp.
- **Duchesnea indica* Focke Syn. *Fragaria indica* Andr. Indian strawberry, *kiphaliya*. A creeping perennial herb found in temperate Himalayas, Nilgiris and north-eastern hills. The small fleshy pinkish red fruit is sweetish to sour, very juicy and is much relished.
- Ehretia acuminata* R.Br. Heliotrope tree, *gul* (Boraginaceae). A small tree found in sub-Himalayan tract, in Orissa and north-eastern hills. The pisiform, blackish-red drupes are sweet.
- E. laevis* Roxb. (Boraginaceae). A small tree found in dry tracts of India, ascending to sub-Himalayan region. The fruit is less pulpy but sweet.
- **Elaeagnus angustifolia* Linn. Syn. *E. hortensis* M. Bieb. Oleaster, *shinlik* (Elaeagnaceae). A shrub found in the western Himalayas. The fleshy ripe fruit is sweet. It is also used for brewing local beer.
- **E. latifolia* Linn. Bastard oleander, *ghiwani* (Elaeagnaceae). An evergreen scandent shrub widely distributed in hilly parts of India. The olive-shaped, yellow ripe fruit with sweetish pulp, sub-acidic flavour of more like red currant is used for making tarts and jellies.

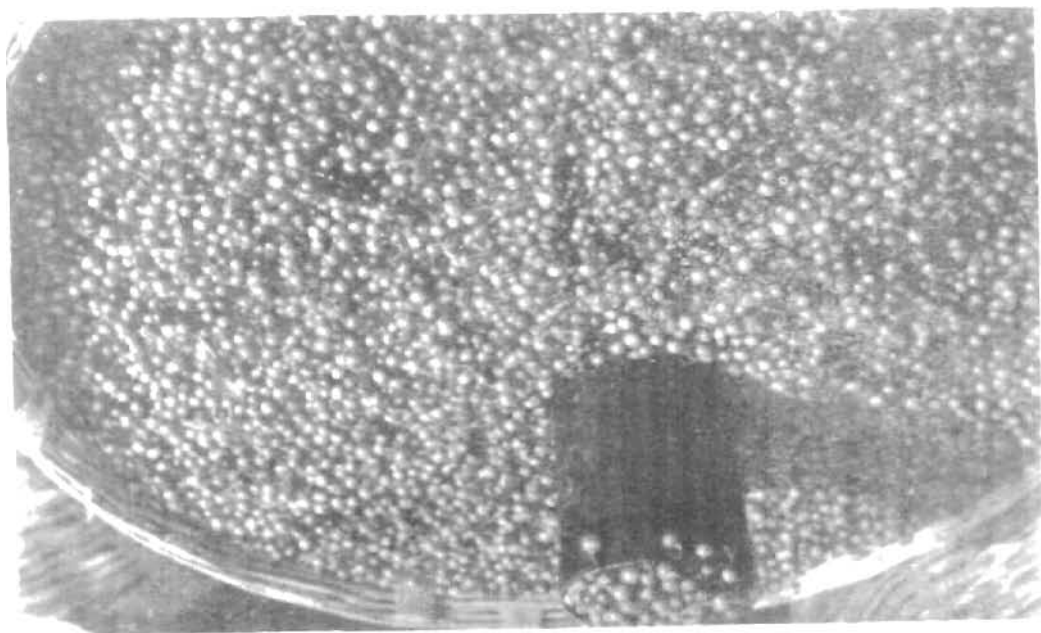


Fig. 33. *Solanum nigrum*—fruits

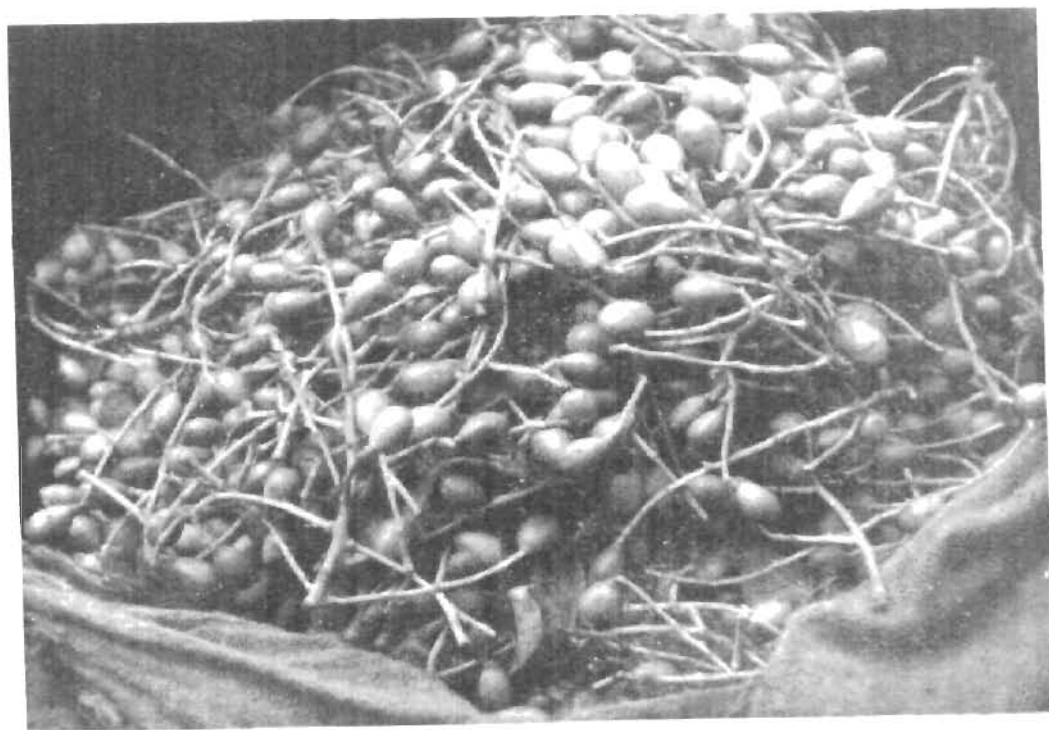


Fig. 34. *Spondias pinnata*—fruits



Fig. 35. *Flacocarpus floribundus*—fruits

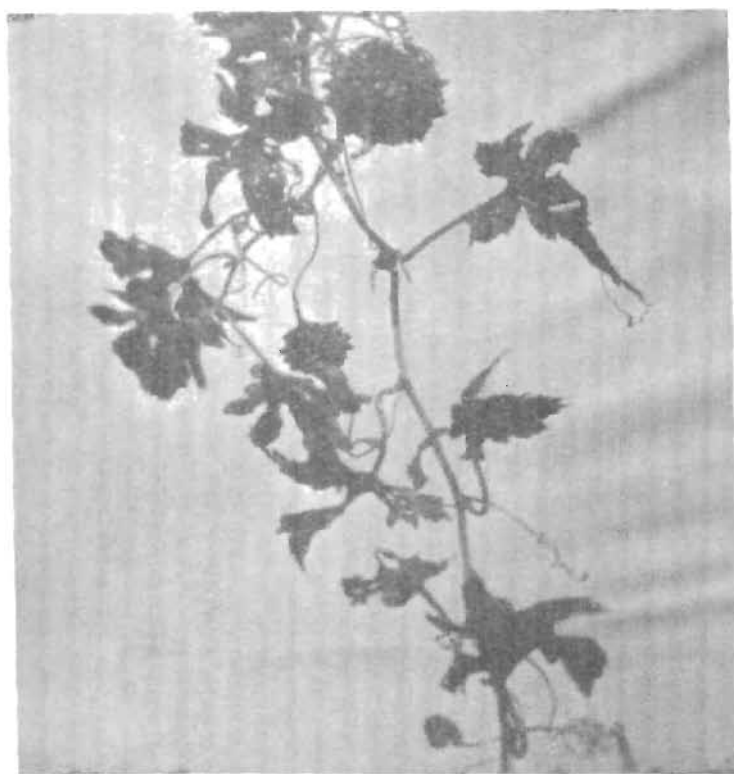


Fig. 36. *Momordica balsamina*—fruiting branch

- E. pyriformis* Hk.f. (Elaeagnaceae). A shrub found in north-eastern hills. The small fruits are sweet and pulpy.
- **E. umbellata* Thunb. *Ghain* (Elacagnaceae). A shrub found in the sub-Himalayan tract and in north-eastern hills. The edible pulp is acidic.
- Elaeocarpus lanceaefolius* Roxb. (Elaeocarpaceae). A tall tree of north-eastern hills and eastern Himalayas. The ripe fruit is edible.
- E. munroii* Mast. (Elaeocarpaceae). An evergreen tree confined to the western ghats. The ripe olive-size fruits are sub-acidic.
- E. prunifolius* Wall. (Elaeocarpaceae). An evergreen tree found in north-eastern hills. The olive-size fruit is occasionally eaten raw.
- E. veruna* Buch.-Ham. (Elaeocarpaceae). An evergreen tree found in Kumaon and eastern Himalayas and in north-eastern hills. The fruit though less pulpy is eaten raw.
- Embelia sessiliflora* Kurz (Myrsinaceae). An evergreen climbing shrub found in north-eastern hills. The small pisiform berries are edible.
- **Emblica officinalis* Gaertn. Syn. *Phyllanthus emblica* Linn. *Amla* (Euphorbiaceae). A deciduous tree found throughout India. The cherry-size yellowish ripe fruits are eaten raw; also made into jams and jellies, and occasionally pickled. The fruit is rich in vitamin C.
- Eriobotrya angustissima* Hk.f. (Rosaceae). An evergreen shrub found in north-eastern hills. The yellow fleshy berries are edible.
- Erioglossum rubiginosum* (Roxb.) Bl. *Ritha* (Sapindaceae). A tree found in peninsular region and north-eastern hills. The edible fruits are blackish.
- Erycibe wightiana* Grah. (Convolvulaceae). An evergreen climbing shrub found in humid tracts and in the sub-Himalayan hills. The black ripe berries are with sweet pulp.
- Erythroxylon monogynum* Roxb. Red cedar (Erythroxylaceae). A small tree found in the western ghats. The small red, juicy ripe fruits have a refreshing taste.
- Eugenia acuminatissima* Kurz non Berg (Myrtaceae). A tree found in Andaman Islands. The ripe fruit is acidic.
- E. kurzii* Duthie (Myrtaceae). An evergreen tree found in eastern Himalayas, Assam and Andaman Islands. The fruit is edible. The fruits of *E. praecox* and *E. praetermissa*, found in north-eastern hills are also eaten.
- **Euphoria longan* Steud. Syn. *Nephelium longana* Camb. *Longan*, *anshphal* (Sapindaceae). An evergreen tree mainly confined to western ghats. The small reddish succulent fruits are taken fresh or in dried and canned form.
- Evodia fraxinifolia* Hk.f. *American beach*, *kaukpa* (Rutaceae). An evergreen tree found in north-eastern hills and sub-tropical Himalayas. The pulp of red pisiform fruits is used in chutneys.
- **Feronia limonia* (L.). *Swingle* Syn. (*F. elephantum* Correa. *Wood apple*, *Elephant apple*, *kaith*, *kutbel* (Rutaceae). An evergreen tree found

- throughout India. The large apple-size fruits possess aromatic pulp which is taken as such or with sugar in sharbats; also used in preparation of chutneys and jellies. (Fig. 28).
- Ficus auriculata* Lour. Syn. *F. roxburghii* Wall. *Timla*, *tirmal* (Moraceae). A tall tree found in the sub-Himalayan region, north-eastern hills, and parts of eastern India. The brownish insipid fruits are used for making jams.
- **F. glomerata* Roxb. Cluster fig, *gular*, *domoor* (Moraceae). A tree found throughout India, extending to the sub-Himalayan region. The fruits which are smaller than the cultivated fig become reddish on maturity and have the flavour of cedar apple. These are used for making jellies. The roasted fruits are said to form an important breakfast with milk and sugar. (Fig. 29).
- F. hispida* Linn.f. (Moraceae). A tree found throughout India; also in outer Himalayas and Andaman Islands. The ripe fruits are made into jellies.
- F. palmata* Forsk. *Anjiri*, *bedu*, *khemri* (Moraceae). A tree found in the Himalayas, Kumoan eastwards and in the hilly peninsular tracts. The fruits are edible.
- F. rumphii* Bl. (Moraceae). A tall tree found in the sub-Himalayan tract and in the peninsular region. The ripe fruits are eaten.
- F. semicordata* Buch.-Ham. ex Smith. Syn. *F. cunea* Buch.-Ham. *Khawan* (Moraceae). A tree found in the sub-Himalayan tract, western and north-eastern India, often along streams. The ripe fruits are taken raw and also made into jams.
- Fissistigma polyanthum* Merrill Syn. *Melodorum polyanthum* Hk.f. & Thoms. (Annonaceae). A climber found in north-eastern hills. The ripe fruits are with aromatic pulp.
- F. verrucosa* Merrill Syn. *Melodorum verrucosum* Hk.f. and Thoms. (Annonaceae). A climber found in north-eastern hills. The ripe cherry-size berries with aromatic pulp are much relished.
- **Flacourtia indica* Merr. Syn. *F. ramontchi* L² Herit. *Kantai* (Flacourtiaceae). A thorny shrub found throughout India. The small pisiform berries are acidic and consumed raw; also good for making jellies, jams and tarts.
- **F. jangomas* (Lour.) Raeusch. Syn. *F. cataphracta* Roxb. ex Willd. (Flacourtiaceae). A small tree found in U.P. hills, eastern and western India and in Assam and adjoining tract. The cherry-size fruit is dark red when ripe, with tarty flavour and is used for making jams, marmalades and preserves.
- F. montana* Grah. (Flacourtiaceae). An evergreen tree found mainly in the western ghats. The purple cherry-size berries possess acidic taste or tarty flavour.

- **Fragaria nilgeerensis* Sch. Houtbois strawberry (Rosaceae). A creeping herb found in Nilgiris and higher hills of north-eastern India. The fruit is pinkish, sub-acidic and juicy.
- **Garcinia atrovirdis* Griff. (Guttiferae). An evergreen tree found in north-eastern hills. The yellow ripe plum-size berries possess sour pulp which tastes excellent when sweetened with sugar.
- **G. cowa* Roxb. Cowa (Guttiferae). A tree mainly found in eastern, north-eastern hilly tracts. The orange-red fleshy acidic berries can be made into jams, jellies and preserves. The dry rind is also preserved. The acidic fruits are also consumed raw.
- G. hombroniana* Pierre (Guttiferae). An evergreen tree found in the coastal region of Nicobar Islands. The fruit is more like mangosteen with peachy flavour and sour taste.
- **G. indica* Choisy, *kokam*, *vishambil* (Guttiferae). An evergreen tree found in the western ghats. The fleshy ripe purple fruit possesses sweetish to acidic pulp. It is also taken with sugar and water as a drink. The dried pulp is used in curries as a substitute for tamarind particularly in Gujarat and Maharashtra.
- G. lanceaefolia* Roxb. (Guttiferae). A tree of north-eastern hills. The orange berries possess acidic pulp and are much relished.
- **G. paniculata* Roxb. (Guttiferae). A tree found in eastern Himalayas and northern hills. The pulpy aril in fruit is like that in mangosteen, highly flavoured and taken with relish.
- G. pedunculata* Roxb. (Guttiferae). A tree found in north-eastern region. The berries of the size of a small apple are acidic.
- G. spicata* Hk.f. Syn. *G. ovalifolia* Hk.f. (Guttiferae). A tree found in eastern and western ghats and in north-eastern region. The edible fruit is pale-greenish and pulpy.
- G. stipulata* T. And. (Guttiferae). A tree found in the eastern Himalayas. The ripe fruit is edible.
- G. tinctoria* Dunn. Syn. *G. xanthochymus* Hk.f. Egg tree, *tamala*, *dampal* (Guttiferae). A tree found in eastern and western peninsula and in Andaman Islands. The fleshy yellow ripe berries with juicy pulp and sub-acidic flavour are made into preserves, jams etc.
- Gardenia latifolia* Ait. *Papra* (Rubiaceae). A small tree found in dry forests throughout India. The plum-size berries are with edible purplish-coloured pulp.
- Caruga pinnata* Roxb. *Ghogar*, *toom* (Burseraceae). A deciduous tree common in the peninsular tropical region. The fleshy drupes are acidic.
- Gaultheria fragrantissima* Wall. Fragrant Wintergreen, *gandapuro* (Ericaceae). An evergreen shrub found in the Nilgiris, Pulney and Khasi hills. The small black succulent berries possess sweetish pulp.

- Gelonium multiflorum* A. Juss. *Ban-naringa* (Euphorbiaceae). A tree found in north-eastern hills. The brownish ripe fruits are caten.
- Gironniera cuspidata* Kurz Syn. *G. reticulata* Thw. *Nara-kiya* (Ulmaceae). An evergreen tree found in the humid tracts of western ghats and in Khasi and adjoining hills. The edible fruit is pulpy.
- Gmelina arborea* Linn. (Verbenaceae) A tree found throughout peninsular India. The drupes are orange-yellow and fleshy.
- Grewia damine* Gaertn. Syn. *G. salvifolia* Mast. (Tiliaceae). A small tree found in Rajasthan, Bihar and drier parts of south India. The small drupes are sub-acidic.
- G. elastica* Royal Syn. *G. vestita* Wall. (Tiliaceae). A small tree found in the sub-Himalayan tract, central India and western ghats. The small black drupes are eaten.
- G. flavescens* Juss. Syn. *G. carpinifolia* Mast. (Tiliaceae). A small tree found in Rajasthan, upper Gangetic plains, in Bihar, central and southern India. The drupes are edible.
- G. hirsuta* Vahl (Tiliaceae). A shrub found in hotter parts of India ascending to sub-Himalayan region. The brownish ripe drupes are with acidic pulp.
- G. polygama* Roxb. (Tiliaceae). A small tree found in the western ghats, other parts of peninsular India, extending to sub-Himalayan tract. The edible drupes are brownish.
- G. rothii* DC. Syn. *G. excelsa* Mast. (Tiliaceae) A shrub found in peninsular tract ascending to the sub-Himalayan region. The small pisiform drupes are eaten.
- G. sapida* Roxb. (Tiliaceae). A shrub found in north-western India eastwards to Assam hills; also in the eastern ghats. The drupes are caten raw. The fruit is also sometimes used for making *sharbats*.
- G. sclerophylla* Roxb. Syn. *G. scabrophylla* Roxb. (Tiliaceae). A shrub found in tropical Himalayas from Kumoan to eastern hills of Assam and adjoining tracts. The brownish ripe drupes are pulpy and glutinous.
- **G. tenax* Fiori Syn. *G. populifolia* Vahl. *Chaberi*, *gondni* (Tiliaceae). An evergreen shrub found in Rajasthan and other arid regions of central, eastern and western India. The edible orange-red drupes are acidic.
- G. tiliaefolia* Vahl (Tiliaceae). A deciduous tree found throughout India except in dry areas; also found in the sub-Himalayan tract. The ripe fruit is black with scanty edible pulp.
- G. villosa* Willd. *Tamhar* (Tiliaceae). A shrub found in the hotter parts of north-western, central and southern India. The red fruits are sweet and pulpy.
- **Haematocarpus thompsonii* Miers. (Menispermaceae). An evergreen climbing shrub found in north-eastern hills. The ripe fruits are with sweet, red juicy pulp.



Fig. 37. *Parkia roxburghii*--young pods



Fig. 3B. *Solanum torvum*--fruits

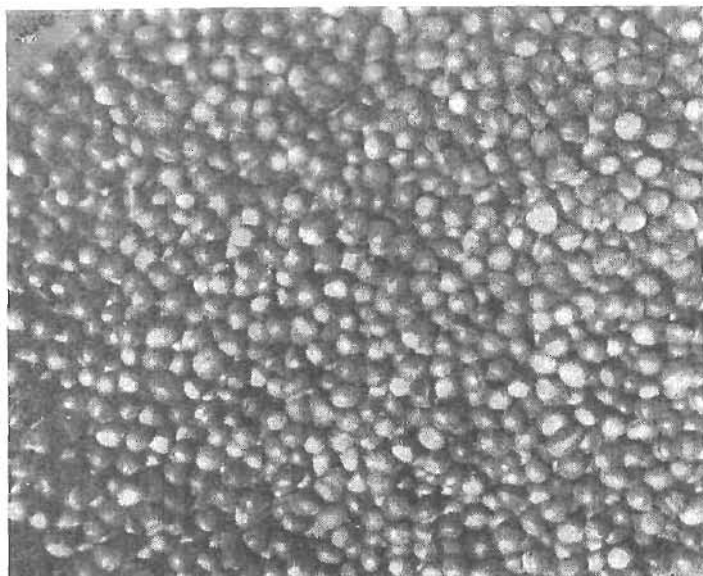


Fig. 39. *Castanopsis indica*—nuts

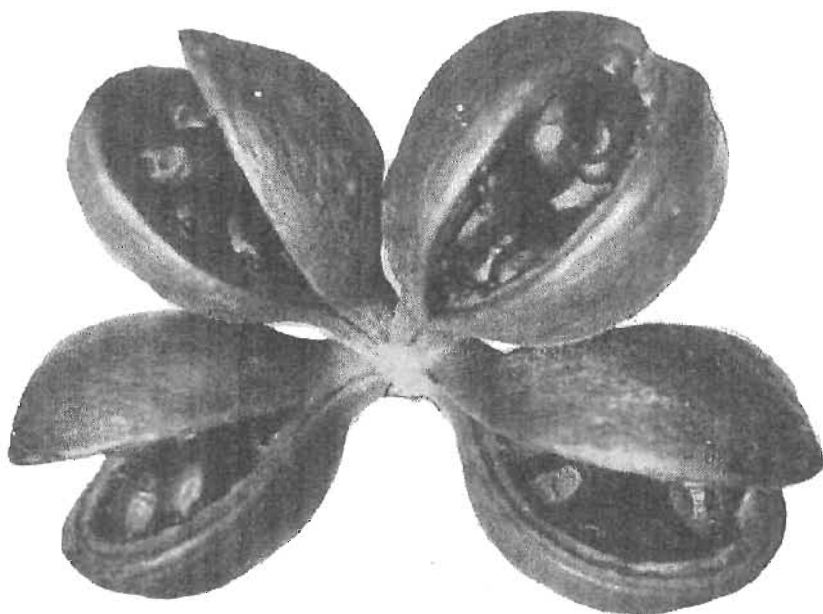


Fig. 40. *Sterculia* sp. (*guttata*)—fruit with seeds

- **Hippophae rhamnoides* Linn. Sea buck thorn, *dhurchuk* (Elaeagnaceae). A small tree found mainly in the Himalayas. The small ovoid fruits are acidic to sub-acidic, rich in vitamin C, and are eaten, and also made into jellies and marmalades. (Fig. 30).
- H. salicifolia* D. Don. *Chuma* (Elaeagnaceae). A shrub found in the western Himalayas. The sub-acidic fruit is eaten.
- Holboellia latifolia* Wall. (Lardizabaceae). A climber found in western Himalayas and north-eastern hilly tract. The large peach-size fruits possess yellow edible pulp.
- Holostemma annularis* (Roxb.) Schum. Syn. *H. rheedii* Spr. *Churval* (Asclepiadaceae). A shrubby climber found all over India except in dry areas. The fruits are eaten.
- Horsfieldia amygdalina* (Wall.) Warb. Syn. *Myristica amygdalina* Wall. (Myristicaceae). A tall evergreen tree found in the humid tracts of north-eastern India. The aril in the fruit is sweet.
- **Hovenia dulcis* Thunb. Japanese raisin tree, *sicka*, *chetihola* (Rhamnaceae). A tree found in the Himalayas. The fleshy and succulent peduncles and inflorescences are sweet smelling and taste like pear.
- Ixora arborea* Roxb. ex Sm. Syn. *I. parviflora* Vahl non Lamk. The Torch tree, *kota gandhal* (Rubiaceae). A shrub common in tropical-subtropical tracts throughout India except in dry region. The ripe fruit is edible.
- Lansium anamalayanum* Bedd. (Meliaceae). An evergreen tree found in western ghats. The ripe fruit is pulpy and of the size of a small cherry.
- Leea crispa* Linn. (Vitaceae). An undershrub found in western peninsula and north-eastern region. The berries are eaten.
- L. edgeworthii* Saut. Syn. *L. aspera* Edgw. non Wall. *Kumali*, *kawaokhar* (Vitaceae). An evergreen shrub found in the sub-Himalayan tract, and in the peninsular region. The ripe fruits are blackish.
- L. indica* (Burm.) Merr. Syn. *L. sambucina* Willd. (Vitaceae). A shrub or a small tree found throughout India. The small fleshy fruit is with scanty edible pulp.
- L. macrophylla* Roxb. ex Hornem, *dholsamudra* (Vitaceae). A herb found throughout India. The black berries are eaten.
- Litsaea glutinosa* C. B. Robinson (Lauraceae). A tree found in north-eastern India. The purple ripe fruit is eaten.
- Lonicera angustifolia* Wall. (Caprifoliaceae). A shrub found in the western Himalayas. The small red fruits are sweet.
- Lycium ruthenicum* Murr. (Solanaceae). A thorny shrub of higher Himalayas. The deep purple ripe berries are fleshy and sweet.
- Madhuca indica* Gmel. Syn. *Bassia latifolia* Roxb. The mahua tree, Illipe butter, *mahua*, *mahwa*, (Sapotaceae). A tall tree common in peninsular India. The fruit is eaten cooked.

- Maesa argentea* Wall. (Myrsinaceae). An evergreen shrub found in the Himalayas eastwards to Khasi hills. The small pisiform fruits are creamish, with scanty pulp.
- M. chisia* Don. (Myrsinaceae). A shrub found mainly in north-eastern hills. The fruit possesses scanty edible pulp.
- M. indica* Wall. (Myrsinaceae). A shrub found throughout India except in in dry region. The succulent fruit is eaten.
- * *Mahonia acanthifolia* Tanaka (Berberidaceae). A tree found in north-eastern hills. The edible purple fruit is sour to taste.
- M. napaulensis* DC. (Berberidaceae). An evergreen shrub found in the Himalayas. The dark purple berries are sub-acidic.
- * *Malus baccata* (L.) Borkh. Syn. *Pyrus baccata* L. Siberian Crab apple, *jangli seb*, *patol* (Rosaceae). A tree found in the western Himalayas. The fruits of var. *himalaica* are eaten in Lahul and possess true apple flavour.
- Mammea longifolia* Planch and Triana Syn. *Ochrocarpus longifolius* Bth. & Hk. f. *nagkesar* (Guttiferac). A tall evergreen tree found in the western ghats. The small berries are eaten. The pulp has the flavour of rose water.
- * *Mangifera indica* Linn. Mango, *aam* (Anacardiaceae). An evergreen tree found wild particularly in north-eastern hills. The fibrous pulpy fruits are sub-sweetish or sour.
- M. sylvatica* Roxb. (Anacardiaceae). An evergreen tree found in north-eastern hills and in Andaman Islands. The ripe fruits are eaten raw though they are not so palatable.
- * *Mavilkara hexandra* Dub. Syn. *Mimusops hexandra* Roxb. *Khirni* (Sapotaceae). An evergreen tree found in tropical tracts throughout India. The small yellow olive-like fleshy fruits are sweet.
- Medinilla rubicunda* Bl. (Melastomaceae). A shrub found in north-eastern hills. The black pea-size berries are eaten though they are insipid.
- Melastoma malabathricum* Linn. India rhododendron, *phutki* (Melastomaceae). An evergreen shrub found mainly in humid tropical tracts throughout India. The black-purple ripe fruits taste like black berry.
- Melocanna bambusoides* Trin. (Gramineae). A bamboo found in Khasi hills and adjoining tract. The huge pear-shaped fruit is eaten.
- Melodinus monogynus* Roxb. (Apocynaceae). A climber found mainly in north-eastern hills of India. The edible berries are fleshy and orange coloured.
- Memecylon umbellatum* Burm. Syn. *M. edule* Roxb. Iron wood tree, *anjan* (Melastomaceae). An evergreen tree found chiefly in humid tropical tracts of India. The edible berries are purplish black.
- Mesua ferrea* Linn. Ironwood, *nagkesar* (Guttiferac). A tall evergreen tree of humid tropical tracts common in western, eastern and north-eastern hills. The chestnut-like fruits are eaten.

- Meyna laxiflora* Robyns Syn. *Vangueria spinosa* Roxb. *Pundrika* (Rubiaceae). A small deciduous tree found throughout India. The yellow fruits are of the size of a plum and fleshy.
- Microcos paniculata* Linn. Syn. *Grewia microcos* Linn. (Tiliaceae). A shrub found in the humid tropical tracts of India. The small pisiform fruits possess scanty edible pulp.
- Miliusa velulina* (Dunal) Hk.f. and Th. *Domsal* (Annonaceae). A deciduous tree found in peninsular region except in arid tract. The small cherry-size fruits possess edible pulp.
- **Mimusops elengi* Linn. *Maulsari* (Sapotaceae). An evergreen tree occurring wild in humid tropical forests. The small olive-shaped edible berries are orange yellow.
- **Morus australis* Poir. Mulberry, *tul* (Moraceae). A deciduous tree found in Kashmir, eastwards to north-eastern region. The purplish ripe catkins are fleshy and sweet.
- **M. indica* Linn. *Tut* (Moraceae). A tree found in sub-Himalayan region eastwards to Assam and adjoining tract of Bengal. The fruit though of inferior quality is edible.
- M. laevigata* Wall. ex Brandis (Moraceae). A tree met with in the Himalayas, Kumoan eastwards to Assam hills and in Andaman Islands. The fruits of longer (10 cm) yellowish catkins are edible though insipid.
- M. serrata* Roxb. Himalayan mulberry, *kimu* (Moraceae). A tree found in the western and central Himalayas. The small catkins are juicy and sweet.
- **Myrica esculenta* Buch-Ham. Syn. *M. nagi* Hook f., Box Myrtle, Bay berry, *kaiphal* (Myricaceae). A tree found in the Himalayas eastwards to Khasi hills and adjoining ranges. The ripe cherry-size red fruits make a refreshing drink in hot season. (Fig. 31).
- Myrsine africana* Linn. (Myrsinaceae). An evergreen shrub or a small tree found in the Himalayas, Kashmir eastwards. The red fruits are eaten.
- M. capitellata* Wall. (Myrsinaceae). An evergreen shrub found mainly in the humid tracts of western ghats and north-eastern region in higher hills. The pea-size edible fruits are purplish.
- Nipa fruticans* Thunb. Water coconut, Nipa palm, *golphal*, *gulga* (Palmeae). A coastal palm found in West Bengal coast and in Andaman Islands. The inside of the large young fruits is edible.
- Nothopegia colebrookiana* Bl. (Anacardiaceae). A tree found in western and eastern ghats and in humid parts of central India. The ripe fruit is with sweet oily pulp.
- Olax nana* Wall. ex Brandis (Olacaceae). An evergreen shrub found in western Himalayas and north-eastern hills. The small purplish-fruits though insipid, are eaten.

- O. scandens* Roxb. *Dheniani* (Olacaceae). An evergreen shrub found in the Himalayas and in peninsular hilly tracts. The ripe fruit is used for making *sharbats*.
- Olea cuspidata* Wall. (Oleaceae). A small evergreen tree found in north-western Himalayas. The fruit is eaten.
- Pandanus lorum* Jones (Pandananaceae). A palm-like plant found in the Nicobar and Andaman Islands. The edible pulp lies in the lower portion of the ripe fruits.
- P. tectorius* Soland, ex Parkinson Syn. *P. odoritissimus* Linn. f. Screw pine, *kaora* (Pandananaceae). A palm-like plant common along coastal tracts. The pineapple like fruits become palish and pulpy on ripening. The pulp is edible.
- Parthenocissus himalayana* (Royle) Planch. Syn. *Vitis himalayana* Brandis (Vitaceae). A woody climber found in the Himalayas and north-eastern hills. The edible berries are black.
- Pegia nitida* Colebr. Syn. *Tapiria hirsuta* Hk.f. (Anacardiaceae). A tree found in north-eastern hills. The ripe fruit has fleshy subacidic aromatic pulp.
- **Phoenix acaulis* Buch-Ham. ex Roxb. *Jangli khajur* (Palmeae). A pigmy palm found in the sub-Himalayan tract, north-eastern and peninsular region in hills. The drupes are fleshy and sweet.
- **P. humilis* Royle var. *pedunculata* Becc. Dwarf date palm, Hill date palm (Palmeae). A palm found in hilly areas of India. The fruits are sweet.
- P. paludosa* Roxb. (Palmeae). A palm mainly found in the coastal swamps of eastern India. The ripe fruit possesses sweetish pulp.
- P. pusilla* Gaertn. Syn. *P. farinifera* Roxb. (Palmeae). A shrubby palm, found along Coromandal Coast and in south India. The fruits are with sweet pulp.
- P. robusta* Hk.f. (Palmeae). A palm found in Bihar and Deccan peninsula. The edible drupes are black/brown.
- **P. sylvestris* Roxb. Wild date palm, *khajur* (Palmeae). A tall palm found throughout India (wild and cultivated). The ripe drupes are with sweetish pulp, eaten as such; also made into jams and jellies.
- Picrasma quassioides* Benn. (Simaroubaceae). A tall shrub found in the Himalayas, Kashmir, eastwards. The ripe fruit is eaten.
- Pinanga dicksonii* Bl. (Palmeae). A straggling palm found in the western ghats. The fruit is used as a substitute for betel-nut.
- P. hookeriana* Becc. (Palmeae). A palm found mainly in north-eastern hills. The semi-fleshy fruit is eaten.
- Premna herbacea* Roxb. *Bharangi* (Verbenaceae). An undershrub found in peninsular India and in the sub-Himalayan tract. The ripe fruit is eaten.
- Protium serratum* Engl. *Mirtenga* (Burseraceae). A tree found in north-eastern region. The small ovoid berries are eaten when ripe.

- Prunus cerasoides* D. Don Syn. *P. puddum* Roxb. ex Brandis non Miq. Himalayan wild cherry, *paddam*, *phuya* (Rosaceae). A tree found in the Himalayas and north-eastern hills. The yellow drupes are sour or acidic.
- **P. cornuta* Steud. Syn. *P. padus* Hk.f. Himalayan bird cherry (Rosaceae). A tree found in Himalayas eastwards to Khasi hills and neighbouring tracts. The fruits are eaten; also used for brewing purposes.
- **P. jenkinsii* Hk.f. (Rosaceae). A tree found mainly in north-eastern hills. The fruits resembling *jaman* fruits are with acidic-sub-acidic, fleshy pericarp. (Fig. 32).
- P. napaulensis* Steud. (Rosaceae). A tree found in the Himalayas, Kumaon eastwards to Khasi hills and neighbouring region. The small fleshy drupes are acidic sub-acidic.
- P. prostrata* Labill. (Rosaceae). A shrubby type found mainly in the western Himalayas. The fruit though with scanty juicy pulp, is edible.
- P. tomentosa* Thunb. (Rosaceae). A shrub or a small tree found in Kashmir. The fruit is edible.
- P. wallichii* Steud. Syn. *P. acuminata* Dietr. non Michx. *Mauli* (Rosaceae). A tree found in central and eastern Himalayas and north-eastern hills. The blackish ripe fruits are eaten.
- Pseudostreblus indica* Bur. (Moraceae). A tree of north-eastern region. The pea-size fruits are eaten.
- Pyralia edulis* A. DC. (Santalaceae). An evergreen tree found in north-eastern hills. The plum-size drupes taste like guava.
- Pyrus kumaoni* Decne (Rosaceae). A tree found in western Himalayas. The over-ripe fruits are eaten. The fruit of *P. lanata* is also consumed likewise.
- P. pashia* Buch-Ham. ex D. Don, *mehal*, *mol* (Rosaceae). A tree found in the Himalayas and in the Nilgiris, Khasi hills and adjoining higher hilly tract. The apple-shaped edible fruits are yellowish-brown.
- Randia spinosa* Poir. Syn. *R. dumetorum* Lamk. Emetic nut, *mainphal* (Rubiaceae). A tree found throughout India especially in hotter parts. The plum-size berries are yellow and occasionally taken raw.
- R. uliginosa* DC. *Pindalu* (Rubiaceae). A scandent shrub found throughout India. The fruit is edible.
- Reptonia buxifolia* A. DC. (Myrsinaceae). An evergreen shrub found in north-western India. The fleshy fruits are eaten.
- Rhamnus persicus* Boiss. (Rhamnaceae). A small evergreen tree of temperate Himalayas. The small pisiform black fruits are sweet.
- Rhizophora mucronata* Lamk. (Rhizophoraceae). A small evergreen tree of tidal muddy shores. The mature fruit is sweet.
- **Rhodomyrtus parviflora* Alston Syn. *R. tomentosa* Wt. Hill guava, Hill gooseberry (Myrtaceae). An evergreen shrub found in Pulney hills and the

- Nilgiris. The olive-size fruit is eaten and also made into jams and jellies, the later preparation being more like the apple jelly.
- **Rhus javanica* Linn. Syn. *R. chinensis* Mill. *Tatri* (Anacardiaceae). A shrub found in north-eastern hills and the Himalayas. The small pinkish red fruits are sub-acidic.
- **R. sinuata* Thunb. Syn. *R. mysurensis* Heyne ex Wt. and Arn. *Dansaru* (Anacardiaceae). A shrub found throughout India. The small pisiform brownish red fruits are sub-sweetish.
- Ribes graciale* Wall. *Karu dhak* (Saxifragaceae). A shrub found in alpine Himalayas. The edible berries are sour.
- **R. nigrum* Linn. The black currant, *papav*, *nabar* (Saxifragaceae). A shrub found in western Himalayas. The pea-size dark-purple berries are sub-sour.
- R. orientale* Poir. (Saxifragaceae). A shrub found in Kashmir Himalayas. The ripe berries are with mawkish sweet taste.
- R. rubrum* Linn. The red currant, *dak* (Saxifragaceae). A shrub found in western Himalayas. The fruits are acidic.
- Rodetia amherstiana* Moq. (Amaranthaceae). A shrub found in Kashmir and Kumaon Himalayas. The bright red berries are edible.
- Rosa gigantea* Collet. Manipur wild rose (Rosaceae). A climbing shrub found in the Himalayas and north-eastern hills. The fruits are eaten.
- R. macrophylla* Lindl. (Rosaceae). A thorny shrub found in the Himalayas. The over-ripe fruit becomes sweet and is eaten.
- R. webbiana* Wall. (Rosaceae). A shrub found in Himalayas from Kashmir to Kumaon. The pink fruits (hips) are eaten. Rose hips are rich in vitamin C.
- Rourea minor* Alston Syn. *R. commulata* Planch. (Connaraceae). A scandent evergreen shrub found in north-eastern hills. The edible part is the bright red aril.
- Roydsia suaveolens* Roxb. (Capparidaceae). An evergreen climber found in north-eastern region. The plum-size fruits are with yellowish sweet, aromatic pulp.
- Rubus biflorus* Buch.-Ham. (Rosaceae). A climbing shrub found in temperate Himalayas. The ripe orange-red fruits are sweet.
- **R. ellipticus* Sm. Himalayan yellow raspberry (Rosaceae). A shrub found in the Himalayas and higher hills of peninsular India. The ripe fruits have the flavour of raspberry, and are eaten raw or made into preserve. It is considered as one of the excellent wild edible fruits.
- R. fruticosus* Linn. The black berry or bramble, *alish* (Rosaceae). A shrub found in the western Himalayas. The black fleshy fruits are sub-sweetish.
- R. lanatus* Wall. (Rosaceae). A rambling shrub found in western Himalayas. The ripe fruits are insipid.

- **R. lasiocarpus* Sm. Ceylon raspberry, *kala hisalu*, *kala anchu* (Rosaceae). A rambling shrub found in the western Himalayas eastwards to Khasi hills; also in higher hills of peninsular India, in the Nilgiris. The black fruits are sweet and juicy and taken raw; also made into jams and jellies. They are also sold in local markets.
- R. lineatus* Reinw. (Rosaceae). A straggling undershrub found in eastern Himalayas. The ripe red fruits are eaten.
- **R. moluccanus* Linn. The black cherry, *katsol* (Rosaceae). A shrub found in the Himalayas, eastwards to Khasi hills, also in the Nilgiris and other higher hills in peninsular India. The small cherry-size scarlet red ripe fruits are succulent and juicy.
- R. niveus* Wall. (Rosaceae). A shrub found in western Himalayas. The fruits are succulent and juicy.
- R. nutans* Wall. (Rosaceae). An unarmed shrub found in western Himalayas. The scarlet drupes have a sub-acidic flavour.
- R. paniculatus* Sm. (Rosaceae). A rambling shrub found in temperate Himalayas, eastwards to Khasi hills. The edible blackish fruits are insipid.
- R. rosaefolius* Sm. (Rosaceae). A shrub found in temperate Himalayas, eastwards to Khasi hills. A variety of this has large reddish succulent edible fruits.
- Sageretia brandrethiana* Ait. (Rhamnaceae). A shrub found in western Himalayas. The small edible fruits are blackish.
- S. filiformis* (Roth) G. Don. Syn. *S. oppositifolia* Brongn. (Rhamnaceae). A straggling shrub found in the western Himalayas. The ripe fruit is black.
- S. theezens* Brongn. (Rhamnaceae). A shrub found in the western Himalayas. The edible fruits are dark-brown.
- Salacia roxburghii* Wall. (Hippocrateaceae). A woody climber found in north-eastern hills. The red fruits, cherry-size berries are gelatinous and pulpy.
- **Salvadora oleoides* Decne. *Bara pilu* (Salvadoraceae). An evergreen shrub found in hotter parts of India. The small yellowish ripe fruits are sweet and eaten. When dried they taste like currants.
- S. persica* Linn. *Chota pilu*, *jal* (Salvadoraceae). A tree found in drier tracts of India. The ripe fruits though less pulpy than above are sweet.
- Sarcostigma kleinii* Wt. and Arn. (Olacaceae). A climbing shrub found in the humid tracts of eastern and western peninsula and in Andaman Islands where its fruits are eaten.
- Saurauja cerea* Griff. (Ternstroemiaceae). An evergreen tree found in north-eastern hills. The ripe berries are eaten.
- S. napaulensis* (Ternstroemiaceae). A tree found in the Himalayas and north-eastern hills. The small pea-size berries are sweet.

- S. panduana* Wall. (Ternstroemiaceae). An evergreen tree found in north-eastern hills. The edible berries are creamy-white.
- S. roxburghii* Wall. (Ternstroemiaceae). An evergreen tree found in north-eastern hills. The edible berries are creamish-white.
- Schizandra grandiflora* Hk.f. and Thoms. (Magnoliaceae). A climbing shrub found in the Himalayas, Kashmir eastwards. The fruits are eaten.
- Securinega leucopyrus* (Willd.) Muell.-Arg. Syn. *Flueggea leucopyrus* Willd. *Hartho* (Euphorbiaceae). An evergreen shrub found throughout India. The berries are white and succulent.
- S. virosa* (Roxb. ex Willd.) Pax and Hoffm. Syn. *Flueggea microcarpa* Bl. (Euphorbiaceae). A shrub found throughout India. The berries are white and fleshy.
- Solanum barbisetum* Nees (Solanaceae). A shrub found in north-eastern region. The berries are pulpy and edible.
- S. nigrum* Linn. Black night shade, *mako* (Solanaceae). A herb common all over India. The ripe berries are sub-sweetish. (Fig. 33).
- Sonneratia caseolaris* (L.) Engl. Syn. *S. acida* Linn. f. (Sonneratiaceae). A tree found along the tidal backwaters in the coastal regions of India. The fruits are acidic.
- Sorbus aucuparia* Linn. Syn. *Pyrus aucuparia* Gaertn. *Battal* (Rosaceae). A tree found in the Himalayas from Kashmir to Kumaon, and in the north-eastern region. The pear-shaped small fruits turn reddish and are taken when over-ripe.
- S. vestita* (Spech.) Hedl. Syn. *Pyrus vestita* Wall. *Mauli* (Rosaceae). A tree found in eastern Himalayas and north-eastern hills. The small pear-shaped fruit is edible.
- **Spondias pinnata* (Linn.f.) Kurz, Syn. *S. mangifera* Willd. Hog-plum, *ambara* (Anacardiaceae). A deciduous tree found throughout peninsular region, extending to the Himalayas. The large olive-shaped yellow fruits are sub-sweetish. They are also preserved. (Fig. 34).
- Streblus asper* Lour. *Siora*, *khorus* (Moraceae). A small tree found throughout India. The pea-size edible fruits are yellow.
- Syzygium aqueum* (Burm.f.) Alston (Myrtaceae). An evergreen tree found in north-eastern hills. The ripe purplish fruits possess sweetish-sub-acidic fleshy pulp.
- S. arnottianum* Walp. Syn. *Eugenia arnottiana* Wt. (Myrtaceae). A tall evergreen tree found in the Nilgiris and adjoining higher hills. The fruits are dark purple with sub-acidic pulp.
- S. calophyllifolium* Walp. Syn. *Eugenia calophyllifolia* Wt. (Myrtaceae). A tall evergreen tree found in the Nilgiris and adjoining higher ranges of western ghats. The purple fruit is sub-acidic and pulpy.
- S. caryophylletum* (L.) Alston Syn. *Eugenia caryophyllaea* Wt. (Myrtaceae). A large shrub or a small tree mainly found in the eastern peninsula often

along water courses. The sub-sweetish pea-size ripe purplish fruits are juicy.

- **S. cumini* (L.) Skeels Syn. *Eugenia jambolana* Lamk. Java plum, *jamun* (Myrtaceae). A tree common throughout India but wild only in humid tropical regions. The olive-size purplish-black fruits are much relished.
- S. heyneanum* Wall. Syn. *Eugenia heyneana* Duthie (Myrtaceae). A small shrub or a tree found often along streams in humid parts of peninsular India. The small oblong fruit is eaten.
- S. mappaceum* (Korth) Mansf. Syn. *Eugenia formosa* Wall. (Myrtaceae). A tree found in north-eastern India. The ripe fruits are eaten.
- S. operculatum* Gamble Syn. *Eugenia operculata* Roxb. (Myrtaceae). A tree found in peninsular region extending to the base of the Himalayas. The edible fruits are purple with scanty pulp.
- S. samarangense* Merr. Perry Syn. *Eugenia javanica* Lamk. Wax jambu, *jamrul* (Myrtaceae). A tree found in Andaman and Nicobar Islands. The fruit is eaten.
- Telrastigma lanceolarum* (Roxb.) Planch (Vitaceae). A climber found in the humid parts of peninsular India and north-eastern hills. The fleshy berries are sub-acidic.
- Trema orientalis* Bl. Charcoal tree, Indian nettle tree, *jiban* (Ulmaceae). A tree common in peninsular India. The small black pea-sized fruits possess scanty edible pulp.
- Trewia nudiflora* Linn. *Pindara* (Euphorbiaceae). A tree mainly seen along river beds, common in humid parts of India. The insipid fruit is eaten.
- Turpinia pomifera* DC. (Sapindaceae). A tall tree found in the humid tropical tracts of India. The edible fruits is with blackish fleshy pericarp.
- Uvaria cordata* (Dunal) Alston Syn. *U. macrophylla* Roxb. (Annonaceae). A woody climber found in north-eastern hills. The ripe fruit is eaten.
- Vaccinium donianum* Wt. (Vacciniaceae). A small tree found in north-eastern hills. The berries are sub-acidic.
- V. griffithianum* Wt. (Vacciniaceae). A small evergreen tree found in north-eastern hills. The ripe berries are eaten. The berries of *V. sprengelii* occurring in this region, are also eaten.
- V. symplocifolium* Alston Syn. *V. laschenaultii* Wt. (Vacciniaceae). A small evergreen tree found in the Nilgiris. The ripe berries are eaten.
- Viburnum corylifolium* Hk.f. and Thoms. (Caprifoliaceae). A small tree found in Khasi hills. The edible fruits are bright red.
- V. cotinifolium* Don (Caprifoliaceae). A large shrub found in north-eastern Himalayas. The berries are edible.
- V. grandiflorum* Wall. ex DC. Syn. *V. foetens* Decne (Caprifoliaceae). A shrub found in Khasi hills. The red drupes are acidic.

- V. nervosum* Don. *Kulwasha* or *kilsnishi*, in H.P. (Caprifoliaceae). A shrub or a small tree found in the western Himalayas. The ripe fruits are black.
- V. stellatum* Wall. (Caprifoliaceae). A shrub found in temperate Himalayas. The ripe red drupes are sour.
- Vitis lanata* Roxb. (Vitaceae). A climber found in north-eastern hills and in the Himalayan region. The black berries are succulent.
- **V. parvifolia* Roxb. Himalayan wild vine (Vitaceae). A climber found in the Himalayas. The black-purple berries are sweet and with good flavour.
- V. rotundifolia* L. (Vitaceae). A climber found in north-eastern hills. The edible berries are blackish.
- Willughbeia edulis* Roxb. (Apocynaceae). A woody climber found in north-eastern hills. The ripe fruits are acidic and pulpy.
- Ximenesia americana* Linn. Tallow tree, *ingudi* (Olacaceae). A shrub found in humid parts of western and eastern peninsula in north-eastern hills, and in Andaman Islands. The fruits possess fleshy edible pericarp.
- Zizyphus apetalata* Hk.f. (Rhamnaceae). A scandent shrub found in north-eastern hills. The small ovoid drupes are eaten.
- Z. funiculosa* Buch.-Ham. (Rhamnaceae). A scandent shrub found in north-eastern hills. The yellowish drupes are with scanty edible pulp.
- Z. incurva* Roxb. (Rhamnaceae). A small tree found in north-eastern region. The small pea-size drupes are eaten.
- **Zizyphus mauritiana* Lamk. Syn. *Z. jujuba* Lamk. *Ber* (Rhamnaceae). A thorny tree found all over India. The fruits of the wild types though with comparatively scanty pulp, are eaten when ripe.
- **Z. nummularia* Wt. & Arn. *Jharberi* (Rhamnaceae). An under-shrub found throughout India. The brownish red fruits are sweet.
- Z. oenoplia* Mill. *Makoh* (Rhamnaceae). A scandent shrub found throughout India except in drier tracts. The small reddish brown fruits are sweet.
- Z. rugosa* Lamk. *Dhaura* (Rhamnaceae). A climbing shrub found throughout India except in drier areas. The creamish ripe drupes are sub-sweet.
- **Z. vulgaris* Lamk. *Sihjuli*, *unab* (Rhamnaceae). A shrub or a small tree found in north-western Himalayas. The oval-shaped drupes are sub-sweet.

(b) Unripe used as vegetable or in pickles

- **Artocarpus heterophyllus* Lamk. Syn. *A. integrifolia* L. Jack-fruit, *kathal* (Moraceae). An evergreen tree chiefly of humid tropical regions. The large unripe fruits are consumed as vegetable or are pickled.
- Atalantia monophylla* Corr. Wild lime (Rutaceae). A climbing shrub found in humid tropical tracts—western ghats, Assam hills and Andaman Islands. The lime-size fruits are pickled.

- Berberis vulgaris* Linn. Common barberry, *chatroa*, *kashmal* (Berberidaceae). A shrub of north-western Himalayas. The small unripe berries are pickled.
- **Capparis decidua* (Forsk.) Pax Syn. *C. aphylla* Roth. *Karir* (Capparidaceae). A hardy bush found in dry areas throughout India. Both young and ripe fruits are pickled.
- C. zeylanica* Linn. *Gitoran*, *his* (Capparidaceae). A thorny shrub found throughout India. The berries are pickled.
- **Carissa congesta* Wt. Syn. *C. carandas* Linn. *Karonda* (Apocynaceae). A thorny shrub common throughout India especially in warmer humid regions. The semi-ripe berries are pickled.
- Coccinea cordifolia* (L.) Cogn. Syn. *C. indica* Wt. and Arn. *Kundri* (Cucurbitaceae). A climbing type common in dry areas. The green fruits are used in curries.
- Commiphora caudata* (Wt. & Arn.) Engl. Syn. *Balsamodendron caudatum* Wt. and Arn. Hill mango (Burseraceae). A deciduous tree found in drier hills of western and eastern ghats. The small pea-size acidic fruits are pickled.
- **Cordia dichotoma* Forst. f. Syn. *C. myxa* L. Sebesten, *lasoor* (Boraginaceae). A deciduous tree found throughout warmer parts of India, extending to the foothills of the Himalayas. The semi-ripe fruits are pickled.
- Cucumis melo* Linn. var. *agrestis* Naud. Syn. *C. pubescens* Willd. (Cucurbitaceae). A creeper widely distributed in peninsular tracts. The fruits are refreshing and eaten like cucumber.
- Dillenia indica* Linn. Elephant apple, *chalta* (Dilleniaceae). An evergreen tree found in humid tropical regions, and in the sub-Himalayan tract. The fruits are eaten cooked in curries.
- Ehretia acuminata* R.Br. Heliotrope tree, *gual* (Boraginaceae). A small tree found mainly in the sub-Himalayan tract, and in north-eastern region. The unripe fruits are pickled.
- **Elaeagnus umbellata* Thunb. *Ghain* (Elaeagnaceae). A shrub found in the sub-Himalayan tract, and north-eastern hills. The fruits are pickled and also eaten in curries.
- **Elaeocarpus floribundus* Bl. *Jalpai* (Elaeocarpaceae). An evergreen tree found in north-eastern hills and eastern Himalayas. The olive-shaped greenish fruits are pickled and also eaten cooked. (Fig. 35).
- E. prunifolius* Wall. (Elaeocarpaceae). An evergreen tree found in eastern Himalayas and north-eastern hills. The fruits are eaten ripe or unripe, and also boiled with vegetables to give them an acidic flavour.
- **E. serratus* Linn., Ceylon olive, *jalpai* (Elaeocarpaceae). An evergreen tree found mainly in the western ghats. The olive-like greenish-yellow fruits are pickled. The fleshy outer sub-acidic portion is eaten in curries; it is also taken raw.

- Emblica fischeri* Gamble. Myrobalan emblic (Euphorbiaceae). A small evergreen tree found in western ghats. The fruits are pickled.
- **E. officinalis* Gaertn. Syn. *Phyllanthus emblica* Linn. *Aonla*, *amla* (Euphorbiaceae). A deciduous tree found throughout India. The fruits are pickled, also made into sweet preserves.
- Ensete superbum* (Roxb.) Cheesman Syn. *Musa superba* Roxb. (Musaceae). A banana-like herb found in humid tropical regions. The young fruits are pickled.
- Ficus auriculata* Lour. Syn. *F. roxburghii* Wall. *Tirmal*, *timla* (Moraceae). A tall tree found in the outer Himalayas, north-eastern hills, parts of peninsular India and in Andaman Islands. The unripe fruit is eaten in curries.
- F. hispida* Linn. f. (Moraceae). A tree found in the outer Himalayas, humid hotter parts of India and in Andaman Islands. The unripe fruit is eaten in curries.
- Garcinia atroviridis* Griff. (Guttiferae). An evergreen tree found in north-eastern hills. The dried rind can be used in place of tamarind as a sour in curries.
- G. cambogia* Desr. *Vilaiti imli* (Guttiferae). An evergreen tree found in the western ghats. The dried rind is used for flavouring curries in place of tamarind or lime.
- **G. indica* Choisy; *kokam*, *vishambil* (Guttiferae). A tall evergreen tree found abundantly in the western ghats. The fleshy pericarp is used in soups for giving acidic flavour to curries. The rind is also used for pickling.
- G. pedunculata* Roxb. (Guttiferae). An evergreen tree found in north-eastern hills. The fruit is acidic and eaten cooked. It can be used as a substitute for lime.
- G. tinctoria* Dunn. Syn. *G. xanthochymus* Hk.f. Egg tree, *tamala*, *dempal* (Guttiferae). A tree found in eastern and western peninsula and in Andaman Islands. The fruit is acidic and can be used in place of tamarind for curries and in place of vinegar.
- Gardenia campanulata* Roxb. *Bitmara* (Rubiaceae). A tree found in north-eastern India and eastern ghats. The fruit is eaten cooked.
- G. turgida* Roxb. (Rubiaceae). A tree found in sub-Himalayan tract, and in the hilly sub-hilly tract of eastern and western India. The fleshy berries are eaten after cooking.
- Jasminum malabaricum* Wt. *Kusar* (Oleaceae). A shrub found chiefly in the western ghats. In the hilly tract of Poona district, the natives make a dish usual by frying and cooking the fruit. It is an important article of food.
- **Mangifera sylvatica* Roxb. (Anacardiaceae). An evergreen tree found in north-eastern hills and in Andaman Islands. The unripe fruits are

- used for tarts and pickles. *Mangifera indica* (wild) is also put to similar usage; its fruits being small, sub-acidic and more fibrous.
- Melothria heterophylla* Cogn. *Kundri*, *anantmul* (Cucurbitaceae). A twiner found throughout India. Berries are eaten cooked or taken raw when ripe.
- **Momordica balsamina* Linn. *Mikha* (Cucurbitaceae). A twiner found in hotter parts of north-western India. The unripe round tender non-bitter fruits are eaten as a vegetable, and are also pickled. Some people call it midget *karela*. (Fig. 36).
- M. charantia* Linn. *Jangli karela* (Cucurbitaceae). A climber occasionally found in wild state. The fruits are consumed as vegetable.
- **M. cochinchinensis* Spr. *Kokrol*, *bhatkarela* (Cucurbitaceae). An extensive climber found in humid parts of eastern and western India and in Andaman Islands. The large oval to sub-roundish fruits are consumed as a vegetable.
- **M. dioica* Roxb. ex Willd. *Kakaura* (Cucurbitaceae). A climber found wild mainly in humid hotter areas in hedges. The young greenish round, tubercled fruits are eaten in curries.
- Morinda tinctoria* Roxb. (Rubiaceae). A shrub or tree found throughout India. The green fruits are pickled, eaten with curries.
- M. umbellata* Linn. (Rubiaceae). A tree found in Khasi hills, and in western ghats. The green fruits are used in curries.
- Moringa concanensis* Nimmo (Moringaceae). A small tree found in dry hills of north-western India, and southwards in Konkan. The unripe fruits are eaten as a vegetable; flowers are also eaten.
- M. oleifera* Lamk. Syn. *M. pterygosperma* Gaertn. (Moringaceae). A tree said to be wild in sub-Himalayan tract. The unripe fruits are pickled.
- **Mucuna prurita* Hk. Syn. *M. pruriens* Baker non DC. The cowhage plant, *alkusi* (Papilionaceae). A climber found in hilly tracts throughout India. The young pods are eaten as a vegetable.
- Olea dioica* Roxb. (Oleaceae). An evergreen tree particularly common in western ghats. The fruit which is of the size of a small olive is eaten in curries. It is also pickled.
- Pandanus andamanensium* Kurz. (Pandanaeae). A palm-like plant found in Andaman Islands. The unripe-ripe drupes are eaten after cooking.
- **Parkia roxburghii* Linn. *Khorial* (Mimosaceae). A tree found in north-eastern hills. The green long pods are eaten cooked as a vegetable. (Fig. 37).
- Pavetta indica* Linn. (Rubiaceae). A shrub widely distributed in tropical sub-tropical tracts. The fruit is pickled and eaten in the western ghats.
- Pouteria tomentosa* (Roxb.) Baehni Syn. *Sideroxylon tomentosum* Roxb. (Sapotaceae). A tree found mainly in humid tropical region of eastern

ghats, and in north-eastern India. The pale coloured berries are used in curries and also pickled.

Randia uliginosa DC. *Pindalu* (Rubiaceae). A shrub or a small tree found throughout India. The fruit is eaten and makes a good vegetable, when cooked.

Solanum erianthemum D. Don Syn. *S. verbascifolium* L. (Solanaceae). A shrub found throughout India except in dry areas. The berries are used in in curries.

S. incanum Linn. (Solanaceae). A prickly shrub found in the peninsular and northern sub-Himalayan tract. The berries are eaten raw or pickled.

**S. indicum* Linn. *Barhanti*, *birhatta* (Solanaceae). A shrub found in humid tropical tracts. The fruit is eaten as vegetable, in curry preparation. It is also used for preparing chutney etc.

S. kurzii Br. (Solanaceae). A shrub found in north-eastern hills. The berries are eaten cooked.

S. spirale Roxb. (Solanaceae). A shrub found in north-eastern hills. The berries are eaten cooked; also taken raw.

**S. torvum* Sw. *Tit-began*, *sundaikai* in south (Solanaceae). A shrub found all over except in dry regions. The berries are eaten as a vegetable; they are also dried and preserved. (Fig. 38).

Sterculia indica Merrill Syn. *S. coccinea* Roxb. (Sterculiaceae). A tree found mainly in eastern Himalayas and north-eastern hills. The tender fruit is eaten as a vegetable. It is cooked like beans.

Trichosanthes dioica Roxb. *Palwal* (Cucurbitaceae). A climber common along hedges and forest openings. The fruit is eaten cooked.

(c) Mainly used as scarcity or famine foods

Acacia leucophloea (Roxb.) Willd. *Safed kikar* (Mimosaceae), young pods.

Albizia procera Bth. *Safed siris* (Mimosaceae); pods.

Allophylus serratus Radlk. (Sapindaceae); fruit pulp.

Caralluma fimbriata Wall. *Makedshingi* (Asclepiadaceae); green fruit.

Careya arborea Roxb. *Khumbi*, *kalikatbai* (Myrtaceae); ripe fruit.

Ficus spp., *F. benghalensis* L. *Bor*, *bargad*, *F. religiosa* L. *pipal* (Moraceae); ripe fruit.

Kedrostis rostrata Cogn. (Cucurbitaceae); ripe fruit

Leptadenia pyrotechnica (Forsk.) Decne Syn. *L. spartium* Wt. (Asclepiadaceae); green fruit.

Michelia champaca Linn. *Champak*, *champa* (Magnoliaceae); fruit pulp.

Milisia tomentosa (Roxb.) J. Sinclair Syn. *Saccopetalum tomentosum* Hk.f. & Th. (Annonaceae); fruit pulp.

Murraya koenigii (L.) Spr. *Mitha-neem* (Rutaceae); ripe fruit.

Nymphoides cristatum (Griseb) O. Kuntze (Gentianaceae); green fruit.

- Oxystelma esculentum* R. Br. (Asclepiadaceae); slimy fruit.
- Pandanus tectorius* Soland ex Parkinson Syn. *P. odoratissimus* Roxb. Screw pine, *keora* (Pandanaeae); fruit pulp.
- Physalis minima* Linn. *Tulatipati*, *papotan* (Solanaceae); ripe berries.
- Podophyllum hexandrum* Royle Syn. *P. emodi* Wall ex Hk.f. & Th. *Papra* (Berberidaceae), ripe berries.
- Pongamia pinnata* (L.) Pierre Syn. *P. glabra* Vent. *Karanj* (Papilionaceae), fruit pulp.
- Prosopis cineraria* Druce Syn. *P. spicigera* Linn. *Jand* (Mimosaceae); tender pods are chopped and cooked.
- Santalum album* Linn. Sandalwood, *chandan* (Santalaceae); ripe fruit.
- Schleichera oleosa* (Lour.) O. Ken Syn. *S. trijuga* Willd. *Kusum* (Sapindaceae). acidic aril.
- Smilax zeylanica* Linn. *Jangli aushbash*, *ramdatun* (Smilacaceae); ripe berries.
- Solanum stramonifolium* Jacq. Syn. *S. ferox* C.B. Clarke (Solanaceae); ripe berries.
- Syzygium claviflorum* (Roxb.) Wall. Syn. *Eugenia claviflora* Roxb. (Myrtaceae); fruit pulp.
- Toddalia asiatica* (L.) Lamk. Syn. *T. aculeata* Pers. *Kanj*, *lindupera* (Rutaceae), fruit pulp.
- Trichosanthes cucumerina* L. *Jangli chachinda* (Cucurbitaceae); unripe fruit.

6. PLANTS WITH EDIBLE SEEDS

WILD plants with edible seeds botanically belong to families like Nymphaeaceae, Papilionaceae and other legume types, Gramineae, Fagaceae and Betulaceae. Only a few species are such whose seeds, nuts or kernels are consumed quite often as food by the tribals, a large percentage of such kinds however, has found usage mainly as scarcity foods during famine.

In the peninsular region, especially in the hilly tracts of central India, Bihar, Orissa and eastwards to Meghalaya and adjoining hills, the tribal inhabitants close to the forested tracts collect ripe-unripe seeds of *Bauhinia vahlii*, *Entada phasioloides*, *Sterculia* spp., *Parkia roxburghii*, *Mucuna prurita* and others which are eaten boiled, roasted or cooked. A very substantial food in this category is of the seeds of *Artocarpus* consumed like the above species and considered to be rich in carbohydrates (38.4 per cent), and proteins (6.6 per cent). Unlike these, the seeds of *Nymphaea* and *Nelumbo* species are eaten raw from the ripe carpels; that of *Nelumbo nucifera* are much liked by the northern people and are more palatable.

Often, it is the kernel or nut that is eaten. In Meghalaya, nuts of *Castanopsis* species and in Himalayas, the kernels of *Hodgsonia heteroclita*, *Corylus colubrina* and *C. ferox* are consumed raw. Seeds of Himalayan species of *Impatiens* e.g., *I. glandulifera* and others, are also eaten like nuts.

More important among edible seed kinds are the kernels of *Buchanania lanzan* (*chironji*), a tree common to peninsular India. The tribals of different ethnic groups spread over this large tract, collect the ripe fruits, eat the scanty sweet pulp and later take out the kernels which are sold mainly in town markets. The kernels which taste like the pistachio nuts are a costly commodity used by the sophisticated society in confectionery preparations. They are rich in proteins (21.6 per cent). Another plant whose seeds are important as an article of food is *Euryale ferox*. Seeds of this are also sold in town markets to be eaten raw or roasted or in various other forms in sweet dishes especially in northern India. Against the above kinds which are utilised as direct seed-foods, indirect utilization of seeds as additions to other edible stuffs is reported in a few cases. Thus the seeds of *Cleome icosandra* are put in curry preparations and those of *Alpinia galanga* as spice.

A large number of wild species possess edible seeds which are consumed especially during famine as scarcity foods. Seeds of *Indigofera glandulosa*, *I. linifolia* and *I. cordifolia* are used likewise for making baked breads out of their seed flour. Seeds of many grasses, particularly *Echinochloa*, *Panicum* and *Eleusine* species are consumed in this way or as roasted stuffs. In most parts of the bamboo-mixed forests of tropical-subtropical India, the grains of *Bambusa bambos* are collected and eaten cooked like rice. Grains

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of legumes like *Vigna capensis* and *Phaseolus sublobatus*, known to be nutritious, are consumed after cooking more like pulses. Plants under this category are: *Alpinia galanga* (L.) Willd. Greater galangal, *kulinjan* (Zingiberaceae). A perennial herb occurring in the humid tropical areas of western and eastern peninsula, extending northwards to lower Himalayan belt. The seeds are used as spice.

**Artocarpus heterophyllus* Lamk. Syn. *A. integrifolia* L. Jack-fruit, *kathal* (Moraceae). A tall evergreen tree found in humid tropical areas of peninsular and north-eastern India. The seeds are rich in starch and are eaten after roasting and boiling.

**Bauhinia vahlii* Wt. and Arn. Camel's foot climber, *jallur*, *maljhan* (Caesalpinaceae). A huge climber found throughout India except in drier tract. The roasted seeds are eaten, particularly in north-eastern hills.

**Buchanania lanzan* Spr. Syn. *B. latifolia* Roxb. Cuddapah almond, *chironji*, *charoli* (Anacardiaceae). A deciduous tree common in tropical forests of peninsular India. The kernels are eaten raw, but more often used in sweetmeats like the pistachio nuts.

Caryota mitis Lour. (Palmeae). A tall palm chiefly met with in Andaman Islands. The kernel is edible and is used as a masticatory with betel-leaf.

Castanopsis hystrix A.DC. Syn. *C. rufescens* Hk.f. and Thoms. (Fagaceae). A tall tree found in eastern Himalayas and Khasi hills. The nuts have a good flavour and are eaten.

**C. indica* A.DC. Indian chestnut, *serang* (Fagaceae). A tall tree confined to Khasi hills and the adjoining north-eastern region. The nuts are eaten. (Fig. 39).

C. tribuloides A.DC. (Fagaceae). A tree found in Kumaon Himalayas; the nuts are eaten.

Cicer soongaricum Steph. (Papilionaceae). A herb of west temperate Himalayas. The grains (raw and cooked) are eaten in parts of Ladakh.

Cirsium lipskyi Petrak Syn. *Cnicus griffithii* Hk.f. (Compositae). A thistle-like herbaceous plant found in north-eastern hills of India. The aromatic seeds are eaten.

Cleome icosandra Linn. Syn. *C. viscosa* Linn. Sticky cleome, *hurhur* (Capparidaceae). A tall herb occurring throughout India in wastelands, often as a weed. The seeds are consumed in curries.

Corylus colurna Linn. Turkish hazelnut, *bhutiabadam*, *urni* (Betulaceae). A tree found in western Himalayas. The kernel is eaten.

C. ferox Wall. Himalayan hazelnut (Betulaceae). A tree found in western and central Himalayas from Kashmir to Kumaon. The kernel is edible.

Corypha utans Lamk. Syn. *C. elata* Roxb. *Buri-palm*, *bajur* (Palmeae). A tall palm found in Andaman Islands. The kernel of young fruits is eaten.

- Entada phasioloides* (L.) Merr. Syn. *E. scandens* Benth. Nicker bean, *babari*, *chian*, *gilla* (Mimosaceae). A huge climbing shrub found in humid tropical tracts. The large seeds are steeped in water and later roasted and eaten.
- Erythrina variegata* Linn. var. *orientalis* (L.) Merr. Coral tree, *panga* (Papilionaceae). A tall tree found in humid tropical tracts of western and eastern ghats, north-eastern hills and in Nicobar and Andaman Islands. The seeds are eaten.
- **Euryale ferox* Salisb. Gorgan nut, *mukhuna* (Nymphaeaceae). An aquatic herb occurring in the fresh water lakes in peninsular tracts excepting drier areas, extending to colder region of Kashmir. The seeds are eaten raw or roasted. The seed flour is a substitute for arrow-root. Mixed with sugar, various dishes are prepared from the roasted seeds.
- Grewia tenax* (Forsk) Fiori Syn. *G. populifolia* Vahl; *gondni*, *chabeni* (Tiliaceae). A small tree or large shrub found in the hotter parts of northern, western and southern India. The seeds are eaten.
- Hodgsonia heteroclita* Hk.f. & Th. *Khaum* (Cucurbitaceae). A woody climber of north-eastern tract. The roasted kernel is edible, much liked by Manipur and Mizo tribals.
- Impatiens balsamina* Linn. Garden balsam, *gulmendi* (Balsaminaceae). A succulent much leafy herb found in the Himalayas and in the humid tropical-sub-tropical areas of peninsular India. The seeds are edible.
- I. glandulifera* Royle non Arn. Syn. *I. roylei* Walp. Himalayan balsam (Balsaminaceae). A small bushy plant common in western Himalayas. The seeds which taste like nuts are eaten raw.
- I. sulcata* Wall. Syn. *I. gigantea* Edgew. Grooved balsam (Balsaminaceae). A tall herb found in the western Himalayas and Kumaon. The seeds are eaten. Even the seed husk is reported to be eaten raw in Lahul.
- I. tingers* Edgew. Syn. *I. racemosa* Hook.f. (Balsaminaceae). A small herb found in Kumaon and western Himalayas. The seeds are edible. The seeds of other Himalayan species like *I. amphorata* Edgew., *I. amplexicaule* Edgew.; and *I. scabrida* DC. are also eaten likewise.
- Mucuna gigantea* DC. (Papilionaceae). A climber found in the humid tropical areas of western, eastern and north-eastern hills. The seeds are used as a vegetable.
- **M. monosperma* DC. (Papilionaceae). A climber found in the humid tropical areas of western, eastern and north-eastern hills. The seeds are used as a vegetable.
- M. prurita* Hk.f. Syn. *M. pruriens* Baker non DC. *Kawach* (Papilionaceae). A climber found mainly in humid tropical-sub-tropical tracts. The roasted seeds are used as a substitute for coffee in south.

- **Nelumbo nucifera* Gaertn. Syn. *Nelumbium speciosum* Willd. Lotus, *kamal*, *kanwal* (Nymphaeaceae). An aquatic herb found all over India. The seeds are eaten and are particularly liked in the north.
- Nymphaea nouchali* Burm.f. Syn. *N. pubescens* Willd. White lotus, *kamal-kakri* (Nymphaeaceae). An aquatic herb found in ponds throughout India. The seeds are parched and eaten.
- N. tetragona* Georgi Syn. *N. pygmaea* Ait. Pigmy water-lily (Nymphaeaceae). An aquatic herb occurring in the Himalayas eastwards to Khasi hills, in ponds and swampy habitats. The seeds are eaten.
- **Parkia roxburghii* G. Don, *supota*, *khorial* (Mimosaceae). A tree confined to north-eastern hills of India. The seeds are eaten after roasting.
- Piliostigma malabaricum* (Roxb.) Benth. Syn. *Bauhinia malabarica* Roxb. Malabar mountain ebony, *amli* (Caesalpiaceae). A tree mainly found in moist tropical forests of India, common in peninsular region except in drier tracts. The seeds are eaten.
- Polygonum glabrum* Willd. (Polygonaceae). A tall herb common in wet lands all over India. The seeds are made into *sattu* with the fruit pedicels.
- **Sterculia guttata* Roxb. *Hirik* (Sterculiaceae). A deciduous tree found in western and eastern ghats, in peninsular region extending to north-eastern hilly tracts. The seeds are eaten roasted. (Fig. 40).
- **S. urens* Roxb. *Kateera-gum* *sterculia*, *gulu*, *katira* (Sterculiaceae). A tree widely distributed in tropical and sub-tropical regions. The seeds are roasted and eaten.
- S. versicolor* Wall. (Sterculiaceae). A tall tree found in north-eastern hills. The seeds are eaten roasted. In this tract apart from the above-species, seeds of *S. villosa*, *S. roxburghii*, *S. coccinea*, and *S. alata* are also consumed.
- Ventilago madraspatana* Gaertn. *Pitti*, *bikakali-bel* (Rhamnaceae). A huge climber found mainly in the humid tropical zone of western ghats. The seeds are edible.
- **Vigna capensis* Walp. (Papilionaceae). A viny plant like cowpea, occurring chiefly in humid tropical areas of western and eastern peninsula and in the sub-Himalayan tract. The seeds are eaten cooked more like pulses.
- V. pilosa* Baker (Papilionaceae). A viny type found in the hilly humid tracts of western and eastern India extending to eastern Himalayas. The cooked seeds are eaten.
- Ximenia americana* Linn. Tallow wood, *ingudi* (Olacaceae). A shrub found in the humid parts of peninsular India and in Andaman Islands. The kernel is eaten and tastes much like filberts.

Mainly used as scarcity or famine foods

- Abutilon glaucum* (Cav.) Sweet Syn. *A. muticum* Cav. (Malvaceae)
- A. indicum* (L.) Sweet, country mallow, *kanghi* (Malvaceae)

- Acacia leucophloa* (Roxb.) Willd. *Safed-kikar*, *arinj*, *ronj* (Mimosaceae)
Achyranthes aspera Linn. *Chirchita* (Amaranthaceae)
Alysicarpus rugosus DC. *Shevra* (Papilionaceae)
Bambusa spp., particularly *B. bambos* (L.) Vass Syn. *B. arundinacea* Willd.
 Thorny bamboo, *bans* (Gramineae)
Bauhinia racemosa Lamk. *Kachnar* (Caesalpinaceae)
Borreria hispida (L.) Schum. Syn. *Spermococe hispida* L. (Rubiaceae)
Boswellia serrata Roxb. ex Colebr. Indian Frankincense, *salai* (Burscraceae)
Brachiaria deflexa (Sch.) C.E. Hubb. (Gramineae)
B. reptans (L.) Gard. ex C.E. Hubb. (Gramineae)
Carthamus oxycantha M. Bieb. Wild safflower, *kantiari* (Compositae)
Cassia tora L. Sickle senna, *pamaar*, *chakunda* (Caesalpinaceae) in sweets.,
 of *C. obtusifolia* eaten as such.
Cenchrus biflorus Roxb. (Gramineae)
C. prieurii (Kunth). Maire (Gramineae)
Chrysopogon fulvus (Spreng.) Choiv. Syn. *C. montanus* Trin. *Goria*, *gogar*
 (Gramineae)
Commelina obliqua Buch.-Ham. *Kanjura* (Commelinaceae)
Corchorus trilocularis Linn. (Tiliaceae)
Cyanotis axillaris Schult. f. (Commelinaceae)
Dactyloctenium aegyptium (L.) P. Beauv. Crowfoot, *makra* (Gramineae)
Dendrocalamus strictus (Roxb.) Nees, solid bamboo, *banskaban* (Gramineae)
Echinochloa colonum (L.) Link Syn. *Panicum colonum* L. *Sawan* (Gramineae)
E. irus-galli (L.) P. Beauv. Syn. *Panicum crusgalli* L. Barnyard millet, *sawan*
 (Gramineae)
Elyonurus hirsutus Munro (Gramineae)
Eragrostis tremula Hochst, *Dhol-phulia* (Gramineae)
Hygroryza aristata (Retz.) Nees (Gramineae)
Indigofera cordifolia Heyne ex Roth (Papilionaceae)
I. enneuphylla Linn. (Papilionaceae)
I. glandulosa Willd. (Papilionaceae)
I. linifolia Retz. (Papilionaceae)
Ischaemum rugosum Salisb. (Gramineae)
Jasminum arborescens Roxb. Tree jasmine, *chameli*, *barakunda* (Oleaceae)
Mangifera indica L. Mango, *aam*, (Anacardiaceae)
Mucuna Spp. (Papilionaceae)
Nymphaea alba Linn. White water-lily, *pandharen-kamal* (Nymphaeaceae)
N. stellata Willd. Blue lotus, *Nilkamal* (Nymphaeaceae)
Oryza rufipogon Griff. (Gramineae)
Oxalis corniculata Linn. Indian sorrel; Creeping sorrel, *changeri*, *amrul*
 (Oxalidaceae)
Pterocarpus marsupium Roxb. Malabar kino, Indian kino tree, *bijasar*, *pitasara*
 (Papilionaceae)

- Sacciolepis interrupta* (Willd.) Stapf. Syn. *Panicum interruptum* Willd. (Gramineae)
Semecarpus anacardium Linn. f. Marking nut-tree, *bhilwa* (Anacardiaceae)
Sesbania bispinosa (Jacq.) W.F. Wight Syn. *S. aculeata* Pers. *dhencha*, *jayanti*
(Papilionaceae)
S. procumbens Pers. (Papilionaceae)
Sesuvium portulacastrum Linn. (Aizoaceae)
Setaria glauca (L.) P. Beauv. Cat-tail millet, *bandra* (Gramineae)
S. pallide-fusca (Sch.) Stapf et C.E. Hubb. Kavatta grass (Gramineae)
Shorea robusta Gaertn. f. Sal (Dipterocarpaceae)
Sterculia spp. *S. bulanghas*, *S. foetida*, *S. pallens* (Sterculiaceae)
Tephrosia purpurea Pers. Purple tephrosia, *sarphonki*, *ban-nil* (Papilionaceae)
Terminalia bellerica Roxb., & other species (Combretaceae)
Trianthema crystallina Vahl, *pather-phor* (Aizoaceae)
Tribulus alatus Linn. (Zygophyllaceae)
T. terrestris Linn. (Zygophyllaceae)
Typha angustata Bory & Chaub. Syn. *T. elephantina* Gr. Elephant grass,
gond-patar (Typhaceae)
Urochloa panicoides P. Beauv. (Gramineae)
Vigna, (*Phaseolus*) spp., wild types in *V. aconitifolia*, *V. radiata* and *V. trilobata*
Phaseolus aconitifolius, *P. sublobatus*, *P. trilobus* respectively (Papilionaceae)
Zizania latifolia Turcz. (Gramineae)
Zizyphus xylopyra Willd. *kat-ber* (Rhamnaceae)

7. OTHER EDIBLE KINDS

OCCASIONALLY, plant-parts other than the leaves, roots, flowers, fruits, seeds, nuts and kernels are also used as foods. The bark of *Cinnamomum zeylanicum* is a well known condiment and a marketable product collected from the humid tropical areas where it widely occurs. In the mountainous tracts bordering Nagaland and Manipur, the tribals slice the bark of *Betula alnoides* into slabs just before the leaves appear. The inner layer of these slabs is separated later and then sun-dried. This is eaten as such or made into flour and eaten cooked. The ash of the bark of *Terminalia tomentosa* is reported to be used by tribals as a substitute for lime with betel-leaf and that of *Fagara budranga* is utilised as a substitute for lime and pepper. Cooked with sugar and mixed with onion and ginger it also makes a pickle. The hill tribals of Assam, also chew the bark of *Sapium baccatum*. More often, the bark or gum of trees e.g., *Acacia nilotica*, *A. leucophloea* and *Ehretia laevis*, is reported to be consumed as a famine or scarcity food.

Fragrant leaves of *Clausena heptophylla* and the roots of *Potentilla mooniana* (Fig. 1) are used as a masticatory being chewed with betel-leaf. In some cases, e.g., *Potentilla fruticosa* and *Camellia kissi*, the leaves are used as a substitute for tea. The tribals of north-eastern region use these plants in this way.

In the palms, the farinaceous parts of trunks are used—the starchy pith in *Corypha elata* and in most other palms. More often, the sap extracted from the inner wood is made use of as a drink; particularly in the palms *Borassus flabellifer* and *Caryota urens*. This sap is also processed and consumed as palm-jaggery.

In the above account a broad introductory picture of the edible wild plants has been presented. Evidently, it is only a limited percentage of the naturally occurring (including naturalised types) widely distributed flora that is consumed as food throughout the country; a larger proportion being of the native localized types—the tribals in different regions having chosen various edible kinds from the flora around their habitations. Depending on their food habits, taste etc. and their capacity to hunt for such kinds in the forested tracts, more and more esculent types are becoming known.

A passing reference may be made here to a few plants which occur in India, but are used as foods by the tribals of the neighbouring countries. Leaves of *Oldenlandia auricularia* and *Hedyotis nitida* are eaten with rice by Sinhalese (Sri Lanka); the natives of Sylhet (Bangladesh) eat the olive-size reddish fruits of *Sapindus attenuatus*; in Burma the fruits of *Sonneratia apetala* are used in curries and those of *S. acida* are used as condiments. Seeds of *Pithecelobium bigeminum* are also used as condiments in Burma.

APPENDIX

TABLE 1. NUTRITIVE VALUES OF SOME WILD EDIBLE TUBEROUS TYPES

Species	Moisture	(% dry basis) Albuminoids	fat	Carbohydrates	fibre	ash
<i>Arisaema concinnum</i>	8.5	7.7	1.4	65.9	8.9	7.6
<i>A. speciosum</i>	7.6	3.8	1.6	76.0	6.1	5.1
<i>Ceropegia bulbosa</i>	5.2	3.4	3.3	66.0	12.6	9.1
<i>Dioscorea glabra</i>	—	9.7	1.3	77.8	3.9	5.8
		10.1	1.4	78.2	5.0	6.7
<i>D. hamiltonii</i>		8.3	0.8	85.5	1.5	3.9
<i>D. hispida</i>	—	7.2	0.9	81.4	3.3	4.0
		9.1	1.1	81.9	6.3	4.6
<i>D. oppositifolia</i>	—	14.7	1.5	68.5	6.5	8.7
<i>D. puber</i>	—	11.4	0.5	78.4	2.9	3.7
		12.4	1.1	81.3	3.4	4.5
<i>Nymphaea alba</i>	—	6.4	—	46.0	10.0	10.8
<i>N. stellata</i>	4.2	14.5	0.4	67.5	5.4	7.8
<i>Pueraria tuberosa</i>	—	10.9	0.5	64.6	28.4	—
<i>Vigna capensis*</i>	76.5	3.4	0.2	18.9	—	—

Data compiled from The Wealth of India.

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TABLE 2. NUTRITIVE VALUES OF SOME WILD LEAFY EDIBLE TYPES

Species	Mois- ture%	Pro- tein%	Fat%	Carbohy- drates%	Mineral matter%	Ca%	P%	Fe mg/100g.	Fibre%	ash%
<i>Amaranthus gangeticus</i> (tender shoots)	85.8	4.9	0.5	5.7	3.1	0.5	0.1	21.4	—	—
<i>A. spinosus</i> (plant)	85.0	3.0	0.3	8.1	3.6	0.8	0.05	22.9	—	—
<i>Cissus quadrangularis</i> (dry plant)	13.1	12.8	1.0	31.6	—	—	—	—	15.6	18.2
<i>Cleome isosandra</i> (leaf/twigs)	80.41	5.64	1.85	—	—	0.88	0.07	24.45	—	37.5
<i>Colocasia esculenta</i> (stalk)	93.4	0.3	0.3	4.1	1.2	0.06	0.02	0.5	0.6	—
<i>Ipomoea aquatica</i> (fresh leaves)	90.3	2.9	0.4	4.3	2.1	0.11	0.05	3.9	—	—
<i>I. hispida</i> (dry plant)	16.13	15.56	2.4	35.12	8.8	1.62	0.55	—	2.78	0.01
(leaves/shoots)	9.22	22.25	9.52	44.44	3.83	—	—	—	10.63	—
<i>Medicago hispida</i> (plant)	20.3	5.1	1.7	—	2.3	—	—	—	3.9	—
<i>Polygonum alpinum</i>	86.4	1.7	0.7	5.1	2.3	—	—	—	3.9	—
<i>P. aviculare</i>	81.6	1.9	0.3	10.2	3.5	—	—	—	3.5	—
<i>P. bistorta</i>	82.6	3.0	0.8	7.9	2.4	—	—	—	3.2	—
<i>P. chinense</i>	—	11.5	0.9	40.2	13.6	—	—	—	33.8	—
<i>P. plebeium</i>	83.2	3.2	0.7	6.9	3.9	—	—	—	2.1	—

Data compiled from Aykroyd (1956) and The Wealth of India

TABLE 3. NUTRITIVE VALUES OF SOME WILD EDIBLE FRUITS

Species	Moisture	Protein	fat	Minerals	Fibre	Carbohydrates	Calories
	(per 100 gm of edible portion)						
<i>Aegle marmelos</i>	61.5	1.8	0.3	1.7	2.9	31.8	137
<i>Artocarpus lakoocha</i>	82.1	0.7	1.1	0.8	2.0	13.3	66
<i>Carissa congesta</i> (dry)	18.2	2.3	9.6	2.8	—	67.1	364
<i>Cordia dichotoma</i>	82.5	1.8	1.0	2.2	0.3	12.2	65
<i>Elaeocarpus floribundus</i>	77.2	0.7	0.4	0.5	1.5	19.5	—
<i>Emblica officinalis</i>	81.2	0.5	0.1	0.7	3.1	14.1	—
<i>Erycibe wightiana</i>	16.0	2.8	1.1	0.9	2.3	79.9	329
<i>Euphoria longan</i>	83.9	1.4	0.3	0.8	0.5	13.1	61
<i>Feronia limonia</i>	64.2	7.1	3.7	1.9	5.0	18.1	134
<i>Flacourtia indica</i>	67.3	1.7	1.8	1.3	4.7	22.7	114
<i>Ficus amea</i>	13.5	8.7	5.7	9.0	13.7	43.1	—
<i>F. auriculata</i>	12.9	8.1	6.1	7.7	31.0	35.5	—
<i>Gardenia latifolia</i>	46.9	3.7	3.7	1.9	9.5	35.0	183
<i>Phoenix sylvestris</i>	59.2	1.2	0.4	1.7	3.7	39.8	144
<i>Randia uliginosa</i>	81.7	1.0	0.2	0.7	3.9	12.5	56
<i>Rhodomyrtus parviflora</i>	82.5	0.6	0.2	0.4	5.6	10.7	47
<i>Rubus fruticosus</i>	87.2	0.5	0.3	0.3	1.0	3.5	19
<i>Spondias pinnata</i>	90.3	0.7	3.0	0.5	1.0	4.5	47
<i>Syzygium cumini</i>	83.7	0.7	0.3	0.4	0.9	14.0	62
<i>Vaccinium leschenaultii</i>	79.5	0.8	0.6	0.3	7.3	11.5	55
<i>Zizyphus rugosa</i>	55.3	3.2	1.3	2.0	4.9	33.3	158

Data compiled from Aykroyd (1956) and The Wealth of India.

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