

A CONTRIBUTION TO THE EDIBLE WILD FRUITS OF UTTAR PRADESH HILLS*

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A B S T R A C T

The present article pertains to edible wild fruits collected from U. P. Hills during the years 1982-1992. The U. P. Hills are situated in the centre of the Western Himalaya. The enumeration deals with the treatment of 67 families including 122 genera and 170 species. The important families represented by local wild fruits are Rosaceae (25), Moraceae (10), Cucurbitaceae (7), Rutaceae (6), Solanaceae (6), Berberidaceae (5), Anacardiaceae (4), Ehretiaceae (4), Elaeagnaceae (4), Euphorbiaceae (4) and Verbenaceae (4). Vernacular names, English names, important field characters, traditional uses by the natives, flowering and fruiting season, distribution and frequency, field numbers and nutritive evaluation for each taxon are presented.

INTRODUCTION

The published work about the edible fruits of the region is scanty and the information lay scattered (Atkinson 1882, Gaur 1977, Gaur and Semwal 1983, Pangety 1981, Pangety *et al.*, 1982, Negi, 1986, 1988, Negi *et al.*, 1985 a, 1988 b, 1990). However, any economic botanist desirous of a broad knowledge on the wild edible fruits of this region will not find a single handbook or even checklist which is devoted to this subject for this entire geographic range. Therefore, it was the objective of the present survey to provide an up-dated work on the wild edible fruits.

The flora and vegetation of U. P. Hills have been explored by several workers *viz.* Thomas Hardwicke 1775-1835, Strachey and Winterbottom 1846-1849 (*see*, Duthie 1906, Burkill

1965), Atkinson 1882, Osmaston 1927, Rao 1959, 1960, Rau 1961, 1963, 1964, Dey *et al.*, 1968, Gupta 1968, Raizada and Saxena 1978, Kala and Gaur 1982, Bhattacharyya and Malhotra 1982, Hajra 1983, Naithani 1984, Semwal 1984, Semwal and Gaur 1981, Negi *et al.*, 1985 b, 1987, 1988 a, Rawat *et al.*, 1985 : but less emphasis is given particularly on wild food plants of this area. No scientific study on edible flora of this region has been made so far. This article embodies a preliminary information on wild fruit plants and their usage by the natives of U. P. Hills.

The Uttar Pradesh hills, in northern India consist of varied climatic zones and mountain-terrain covered by different types of plant communities and sustains several ethnic groups of human population. Its varied geographical, social, economic and vegetational features present an interesting utilization of wild fruit plants. This article mainly focuses on them.

GEOGRAPHY AND CLIMATE

The region encompassing U. P. Hills has been the cradle of an ancient civilization and

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was known as Madhyadesh in ancient times. The region consists of eight hill districts viz., Almora, Nainital, Pithoragarh, Dehradun, Pauri, Chamoli, Tehri and Uttarkashi. These cover an area of 51,125 sq. km and have a total population of 58.74 lakhs (Census, 1991).

The region exhibits perhaps the greatest climatic and altitudinal variation as reflected in the slope aspects, density and great diversity of vegetation and flora. The mean maximum and minimum temperature, humidity and rainfall also vary considerably from season to season.

SIGNIFICANCE OF THE PRESENT STUDY

Before the folk-lore value of these wild fruit plants is lost in the wake of rapid urbanization, it would be appropriate to prepare an inventory, collect and preserve this wealth.

The principal wild food plants of the area are berries, and bulbs, but other plant parts such as roots, rhizomes, leaves, young shoots, flower buds and sapwood are also utilized. The degree of importance of these different kinds for the local inhabitants varies from area to area.

Local fruit species play a vital role in maintaining the ecosystem of a particular zone. However, these vary from place to place as per the prevailing agro-ecological situations. The wild species are hardy, resistant to drought, diseases and pest and maintains itself inspite of the abrupt variations in temperature, frost, hails etc., and these can be fitted into a strategy of land reclamation, and revised cropping system (Baily 1953, Pathak and Srivastava 1971, 1975, Srivastava *et al.*, 1977).

Most of the wild fruit species prove a good rootstock for the commercial cultivars of the fruit crops due to their wider adaptability, vigorous growth and resistance to major diseases and pests (Singh 1942, Srivastava 1965). On the basis of these characteristics

these indigenous fruit species can be utilized as a good breeding material for the improvement of horticultural crops (Randhawa and Rana 1977, Arora and Nayar 1984, Nautiyal and Satya Prakesh 1986, Paroda and Arora 1986).

Present survey has resulted in locating several little known fruits from the U. P. Hills and these have been highlighted and marked with an asterisk in the text.

Eight samples of wild fruit species mentioned in the table 1, marked with an asterisk have been analysed at RRL, Jammu to assess the nutritional status and nutritional data and other wild fruit species compiled from different sources (Anonymous 1948-1972, Aykroyd 1956, Gopalan *et al.*, 1971, Singh and Arora 1978, Kaul *et al.*, 1985). The constituents analysed are moisture, protein, fibre, fat, carbohydrates, minerals, sodium, potassium, calcium, phosphorus, iron and vitamins. Some of the wild fruits i.e., *Artocarpus lacucha*, *Berberis asiatica*, *Myrica esculenta*, *Rubus ellipticus*, *Syzygium cumini* etc., are largely sold in the market.

MATERIAL AND METHODS

The description regarding the edible usage of wild fruit plants are based on the information collected from the native people in the sub-Himalayan tracts and high altitudes of U.P. Hills during different seasons beginning from May 1982 to May 1992.

The herbarium specimens have been prepared as per the modern established procedures and normal practices (Jain and Rao 1977, Jain 1987). All the specimens were identified with the help of relevant flora and compared with the authentic material housed at BSD and DD herbaria. The materials (plant and their products) after identification have been deposited and maintained in the herbarium of H. N. Bahuguna Garhwal University, Department of Botany, Srinagar Garhwal (GUH).

ENUMERATION OF THE WILD EDIBLE FRUIT PLANT SPECIES

The present data have been prepared on modern lines delimiting the various taxonomic categories such as families, genera and species.

The plants are arranged alphabetically on the basis of distribution, zonationwise as follows : (1) common in low altitude-tarai/bhabar region (68); (2) sub-temperate/temperate (46); (3) alpine/cold arid desert habitat (19); (4) widely distributed (37).

Native information about wild fruit plants and their local names, method of preparation/utilization, storage are mentioned at the end of citation. Verifications of edible nature were made on the basis of information available from the local inhabitants and also incorporating further from the literature (Watt 1889-1893, Kirtikar and Basu 1918, Anonymous 1948-1972, Chopra *et al.*, 1956, 1969, Maheshwari and Singh 1965, Singh and Arora 1978, Jain 1981, Singh *et al.*, 1983, Kunkel 1984).

Besides edible wild fruits, other usages as condiments, flavourers, seasoners, sweet gums, chewing raw are also included.

Introduced species have been avoided i.e., *Actinidia chinensis* (Kiwi fruit), *Careya arborea* (Pecan nut), *Cyphomendra betacea* (Tree tomato), *Diospyros kaki* (Japanese persimon), *Eriobotrys japonica* (Loquat), *Persea americana* (Avocado); they have become naturalized and are frequently gathered and sold. In the enumeration given, vernacular names (V) and English names (E)—wherever possible are provided.

(1) Low altitude-Tarai/Bhabar region :

Aegle marmelos (L.) Corr. (Rutaceae) (V. Bel; E. Bengal quince holy fruit).

Tall tree. Flowers greenish-white, fragrant. Fruit globose, 4.5-20.5 cm diam., grey or yellow. Sweet aromatic orange pulp of ripe fruits edible and diluted with water, it makes

refreshing drink or *sherbet* and considered good of patients suffering from bacillary dysentery.

Fl. & Fr. : Apr.-Nov.

Uncommon, associated with Oak-Rhododendron forest. 4506.

Aesandra butyracea (Roxb.) Baehni (Sapotaceae) (V. Cheura, Bhulel; E. Indian butter tree, Honey flowers).

Small deciduous tree. Flowers white, fragrant. Berries 0.8-3.2 cm, ellipsoid, green, shining with milky juice. The juice extracted from the flower is made into jaggery (*gur*) after prolonged steaming. It is mixed with milk, tea and with other preparations. Ripe fruits are eaten, sweet in taste. An edible oil is extracted from the seeds.

Fl. & Fr. : Oct.-July.

Not common, along river bank, semi-domesticated. 4855.

Annona squamosa L. (Annonaceae) (V. Jangli Sharifa; E. Custard Apple, Sugar Apple).

Small shrub. Flowers greenish. Fruits yellowish-green, succulent, 4.5-9.5 cm in diam. Ripe fruits are eaten, sweet in taste. Fresh flowers are also eaten.

Fl. & Fr. : May-Oct.

Common. 4670.

Antidesma acidum Retz. (Euphorbiaceae) (V. Imli, Kali. Khatai).

Deciduous small shrub. Flowers greenish-yellow. Drupe purplish-red when ripe, 4 mm in diam. Leaves and fruits have a pleasantly acrid or sour taste and are much eaten either raw or pickled.

Fl. & Fr. : May-June.

Common, riverine places. 4445.

Ardisia floribunda Wall. (Myrsinaceae) (V. Kadna, Banjani; E. Marlberry).

Evergreen small shrub. Flowers pink. Berry deep-red, turning black when ripe, globose, 5-angled, about 5 mm in diam.

Table 1 : Nutritional composition of some

Sl. No.	Botanical Name of wild edible fruits	Edible portion (%)	Moisture in fresh fruits (g)	Moisture in dry fruits (g)	Protein (g)	Fat (g)	Minerals (g)	Fibre (g)	Carbo-hydrates (g)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1.	<i>Aegle marmelos</i>	64	—	61.5	1.8	0.3	1.7	2.9	31.8
2.	<i>Annona squamosa</i>	45	70.5	—	1.6	0.4	0.9	3.1	23.5
3.	* <i>Artocarpus lakoocha</i>	76	82.1	—	0.7	1.1	0.8	2.0	13.3
4.	* <i>Berberis chitria</i>	—	—	5.1	7.7	6.1	—	10.9	17.3
5.	* <i>Carissa opaca</i>	—	77.0	5.8	4.9	1.7	—	9.5	10.6
6.	<i>Cordia dichotoma</i>	—	—	82.5	1.8	1.0	2.2	0.3	12.2
7.	<i>Duchesnea indica</i>	96	—	87.8	0.7	0.2	0.4	1.1	9.8
8.	<i>Ephedra gerardiana</i>	—	—	—	8.3	3.0	—	17.5	40.4
9.	<i>Erycibe paniculata</i>	—	16.0	—	2.8	—	—	2.3	79.9
10.	<i>Ficus auriculata</i>	—	—	12.9	8.1	6.1	—	31.0	33.5
11.	<i>Flacourtia indica</i>	—	—	67.8	1.7	1.8	1.3	4.7	22.7
12.	<i>F. jangomas</i>	—	—	77.7	0.5	0.1	0.8	1.0	19.9
13.	* <i>Hippophae rhamnoides</i> ssp. <i>salicifolia</i>	—	—	5.0	12.1	12.3	—	5.5	9.4
14.	<i>Morus</i> sp.	100	—	86.5	1.1	0.4	0.6	1.1	10.3
15.	* <i>Opuntia elatior</i>	—	85.0	—	0.8	0.6	—	0.5	3.8
16.	<i>Phyllanthus emblica</i>	89	—	81.8	0.5	0.1	0.5	3.4	13.7
17.	<i>Prunus persica</i>	85	—	86.0	0.6	0.2	0.3	1.0	11.9
18.	<i>Punica granatum</i>	68	—	78.0	1.6	0.1	0.7	5.1	14.5
19.	* <i>Pyrus pashia</i>	—	7.2	—	1.9	0.7	—	25.1	14.7
20.	<i>Randia uliginosa</i>	—	—	81.7	1.0	0.2	0.7	3.9	12.5
21.	* <i>Rhus semialata</i>	—	—	—	6.5	17.1	—	32.5	9.5
22.	* <i>Rosa brunonii</i>	—	—	8.1	4.4	5.3	—	38.1	15.9
23.	<i>Schleichera oleosa</i>	—	—	86.2	1.5	8.0	1.0	0.6	9.9
24.	<i>Spondias pinnata</i>	—	—	90.3	0.7	3.0	0.5	1.0	4.5
25.	<i>Syzygium cumini</i>	75	—	83.7	0.7	0.3	0.4	0.9	14.0
26.	<i>Zizyphus mauritiana</i>	—	—	81.6	0.8	0.3	0.3	—	17.0

wild edible fruits (g) 100 G in dry/fresh fruits

Energy	Ca	P	Fe	K	Na	Carotene	Thiamine	Riboflavin	Niacin	Vitamin C
(K Cal)	(mg)	(mg)	(mg)	(mg)	(mg)	(mg)	(mg)	(mg)	(mg)	(mg)
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
137	85	50	0.6	—	—	55	0.13	0.03	1.1	8
104	17	47	1.5	—	—	—	0.07	0.17	1.3	37
66	50	20	0.5	—	—	254	0.02	0.15	0.3	135
—	200	83	66.0	800	40	—	—	—	—	—
—	336	78	7.0	—	28	—	—	—	—	—
65	40	60	—	—	—	—	—	—	—	—
44	30	30	1.8	—	—	18	0.03	0.02	0.2	52
—	1800	377	94.0	—	219	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—
114	100	100	—	—	—	—	—	—	—	—
83	43	25	—	—	—	—	—	—	—	—
—	100	50	116.0	500	45	—	—	—	—	—
49	70	30	2.3	—	—	57	0.04	0.13	0.5	12
—	—	—	—	—	—	—	—	—	—	—
58	50	20	1.2	—	—	9	0.03	0.01	0.2	600
52	8	15	0.5	—	—	28	0.06	0.03	0.2	—
65	10	70	0.3	—	—	—	0.06	0.10	0.3	16
—	100	50	66.0	550	66	—	—	—	—	—
56	33	13	—	—	—	—	—	—	—	—
—	200	66	83.0	450	40	—	—	—	—	—
—	600	82	80.0	600	25	—	—	—	—	—
53	15	42	—	—	—	—	—	—	—	—
48	36	11	3.9	—	—	270	0.02	0.02	0.3	21
62	15	15	1.2	—	—	48	0.03	0.01	0.2	18
74	4	9	1.8	—	—	21	0.02	0.05	0.7	76

Ripe fruits are eaten raw. Dried leaves are used to flavour tobacco.

Fl. & Fr. : May-Feb.

Fairly common, banks of streams and rivers. 4484.

Artocarpus lacucha Ham. (Moraceae) (V. Dhau ; E. Monkey jack lakoocha). Figs. 34 & 35.

Large deciduous tree. Flower heads shortly peduncled, pubescent. Fruits loculate, velvety, yellow or orange when ripe, 4.5-10 cm in diam. Male inflorescence (flower-balls) are cooked as a vegetable or pickled. Ripe fruit is eaten raw, also made into sauce. Unripe and mature fruits are eaten, pickled or cooked as vegetable. Cut into thin slices and dried, preserved as an acidulous spices popularly used in some curries often as a substitute for tamarind. Inner bark is sometimes chewed. Fruits are sold in the market.

Fl. & Fr. : Feb.-Aug.

Common, associated with *Shorea robusta* and *Anogeissus latifolia* forests. 4449.

Bridelia scandens (Roxb.) Willd. (Euphorbiaceae) (V. Kangia bel).

Large climber or sarmentose shrub. Flowers greenish-yellow. Drupe ovoid, 0.6-1.2 cm long, smooth, reddish to blue-black and juicy when ripe. Ripe fruits are eaten raw.

Fl. & Fr. : Oct.-March.

Common, associated with *Shorea robusta* and *Anogeissus latifolia* forests. 4447.

B. squamosa (Lamk.) Gaertn. (Euphorbiaceae) (V. Goli, Ekdana, Suvnaka, Khaja).

Small tree. Flowers greenish-yellow. Drupe 5-10 mm in diam., globose, succulent, greenish-yellow when ripe. Ripe fruits are eaten raw, sweet in taste.

Fl. & Fr. : May-June.

Uncommon, moist and shady places. 4446.

***Callicarpa macrophylla** Vahl. (Verbenaceae) (V. Daiya, Shiwali). Fig. 29.

Shrub. Flowers pink. Drupe globose, fleshy, white ; ripe fruits are eaten raw, sweet in taste.

Fl. & Fr. : June-Feb.

Common, shady moist and in ravines. 4589.

Capparis spinosa L. var. **himalayensis** (Jafri) Jacobs (Capparidaceae) (V. Bauri, Busser, Kiari ; E. Caper bush or plant). Fig. 8.

Trailing shrub with hooked spines. Flowers white, fading pinkish-purple, fragrant. Berry red when ripe, raised on 2.5-6.5 cm long stalk, obovoid. Flower buds and young fruits are used as condiments. Leaves are cooked as vegetables. Fruits are eaten raw and sweet in taste, occasionally pickled.

Fl. & Fr. : May-Nov.

Common, hot dry rocks and stony hills. 4405.

C. zeylanica L. (Capparidaceae) (V. Hins, Kalhis, Bipwa-Kanta). Fig. 9.

Climbing shrub. Flowers white, turning dull rose-coloured or purplish, scented. Berry reddish-brown or orange when ripe, 2.5-3.5 cm diam., sub-globose. Ripe fruits are eaten. Fruits are pickled and used in curries.

Fl. & Fr. : Feb.-Sept.

Fairly common, climber over the trees. 4406.

Careya arborea Roxb. (Barringtoniaceae) (V. Kumbji, Kalikhatai ; E. Patna Oak).

Small deciduous tree. Flowers pale-greenish, tinged with pink, fragrant. Fruits 4-5 cm in diam., globose, green, glabrous. Ripe fruits are eaten raw and seeds taken after roasting. Bark and roots are also eaten.

Fl. & Fr. : Mar.-July.

Common, associated with *Shorea robusta*, *Anogeissus latifolia* forests. 4672.

Cassia floribunda Cav. (Caesalpinaceae) (V. Taror).

Tall perennial undershrub. Flowers yellow.

Pods 7-10 cm long, glabrous. Young pods are cooked as vegetable. Seeds after roasting are used as substitute for coffee and tea.

Fl. & Fr. : June-Dec.

Common; dry slopes and alongsides streams. Cultivated in villages throughout the hills. 4498.

Cassia occidentalis L. (Caesalpinaceae) (V. Chakanda; E. Coffee senna, Negro coffee, Foetid cassia).

Erect foetid undershrub. Flowers yellow. Pods slightly falcate, compressed, 10-15 × 0.6-1.0 cm, appressed-short hairy, distinctly torulose. Young shoots and pods are cooked as a vegetable. Seeds are used as substitute for coffee.

Fl. & Fr. : July-Nov.

Fairly common, open dry slopes. 4615.

Celastrus paniculatus Willd. (Celastraceae) (V. Malkauni; E. Black oil plant, Climbing staff plant).

Large deciduous climber. Flowers yellowish-green. Capsule round, bright yellow, 1.0-1.5 cm diam. Unripe fruits are boiled and cooked as vegetable.

Fl. & Fr. : Mar.-Nov.

Common, rocky places. 4477.

Coccinia grandis (L.) Voigt (Cucurbitaceae) (V. Kanduri; E. Kova fruit, Ivy gourd).

Climber. Flowers white. Fruits ellipsoid, oblong, cylindrical with rounded ends, green with 10 white strips, bright scarlet when ripe, 2.2-4.5 cm long. Unripe fruits are cooked as vegetable or in curries and also pickled. Tender shoots are also cooked as a vegetable.

Fl. & Fr. : June-Sept.

Uncommon, in waste places. 4698.

Cordia dichotoma Forester (Ehretiaceae) (V. Lisora; E. Clammy cherry, Indian cherry, Sebestin).

Deciduous tree. Flowers white, fragrant. Drupe globose or ovoid, yellowish or pinkish,

1.0-1.8 cm in diam. Ripe and unripe fruits are eaten raw, sweet in taste. Fruits are also pickled.

Fl. & Fr. : Mar.-July.

Common, in ravines along the streams, occasionally planted. 4433.

C. vestita Hook. f. & Thoms. (Ehretiaceae) (V. Bairula, Baiuil).

Small deciduous tree. Flowers yellowish-white. Drupe depressed globose, yellow, 1.4-1.8 cm in diam. Ripe fruits are eaten raw and is regarded as superior to that of *C. dichotoma*.

Fl. & Fr. : Apr.-Oct.

Common, shady and moist forests. 4434.

Cucumis sativus L. var. **hardwickii** Royle (Cucurbitaceae) (V. Ailaru, Elaru, Jangli Kheera).

Climber. Flowers yellow. Fruits oval-oblong, rounded at both ends, 4.5-8.0 cm long and 2.0-3.5 cm in diam., marked with narrow white stripes, ripening to yellow. Although fruit and its flesh is very bitter in taste, seeds are consumed. Fruits are used to treat pneumonia.

Fl. & Fr. : Aug.-Oct.

Common. 4687.

Dillenia indica L. (Dilleniaceae) (V. Chalta; E. Elephant apple).

Small tree. Flowers white, scented. Fruits fleshy, 6.5-11.5 cm in diam., enclosed by fleshy calyx. The fleshy calyx are eaten raw or cooked, sour in taste. Ripe fruits are eaten raw, sweet in taste. The juice of the fruit mixed with sugar and water is used as cooling drink in fever.

Fl. & Fr. : May-Nov.

Common, in *Shorea robusta* forest. Often cultivated. 4481.

Diospyros tomentosa Roxb. (Ebenaceae) (V. Mitha-tendu, Tendu; E. Coromandal ebony persimon).

Small deciduous tree. Flowers white. Fruits globose, yellowish when young, fragrant. Ripe pulpy fruits are eaten raw, sweet in taste, and much appreciated during the season. Fruits are sold in the market.

Fl. & Fr. : Apr.-July.

Common, associated with *Shorea robusta* and *Anogeissus latifolia* forests. 4424.

Diplocyclos palmatus (L.) Jeffrey (Cucurbitaceae) (V. Ban kakri).

Scandent climber. Flowers greenish-yellow. Fruits spherical, yellowish-green, or red with 6-white stripes, 1.2-1.8 cm diam. Fruits are eaten raw and also cooked as vegetable.

Fl. & Fr. : Aug.-Oct.

Common ; roadsides, waste places, hedges, scrub jungles. 4699.

Ehretia acuminata R. Br. (Ehretiaceae) (V. Narra, Pandaya, Punera, Punya ; E. Heliotrope Tree).

Deciduous tree. Flowers white or creamy, unpleasant. Drupe elliptic or round, orange, orange-red to nearly black when ripe, 3-4 mm in diam. Ripe fruits are eaten raw and unripe fruits are pickled.

Fl. & Fr. : Mar.-Dec.

Uncommon, bordering streams and in open places. 4726.

E. laevis Roxb. (Ehretiaceae) (V. Khoda, Mendu).

Deciduous tree. Flowers white, faintly scented. Drupe round, orange, red or black with a juicy flesh, faintly 2-4-lobed, 3-8 mm in diam. Ripe fruits are eaten raw, sweet in taste, and inner bark of stem are eaten during famine.

Fl. & Fr. : Feb.-May.

Common, *Shorea robusta* and *Acacia catechu* forests. 4435.

Elaeagnus latifolia L. (Elaeagnaceae) (V. Leuchadia ; E. Bastard Oleaster).

Small evergreen tree. Fruits 1.5-3.5 cm long.

ovoid-oblong, succulent, red or yellow when ripe. Ripe fruits sweet-sour in taste and pulpy, also made into pickles.

Fl. & Fr. : Mar.-Oct.

Common. 4508.

Elaeocarpus sphaericus (Gaertn.) K. Schum. (Elaeocarpaceae) (V. Rudrakash).

Small tree. Drupe glabrous, somewhat obovoid, purple. The fleshy mesocarp of the ripe fruit is consumed by the local people. The taste of the fruit is sweet-sour.

Fl. & Fr. : May-Nov.

Cultivated near temples. 4679.

Erycibe paniculata Roxb. (Convolvulaceae) (V. Ghat ; E. Indian archipelago).

Shrub. Flowers yellow. Berry sub-globose or elliptic, ellipsoid, black and pulpy when ripe, 0.7-1.2 cm in diam. Ripe fleshy fruits are eaten raw, sweet in taste.

Fl. & Fr. : May-Nov.

Common, shady forest. 5741.

Ficus semicordata Buch.-Ham. ex Sm. (Moraceae) (V. Jangli anjeer, Khainu).

Small tree. Figs in pairs or small clusters on long leafless scaly shoots upto 4.5 cm in diam., from the large branches or from the main stem near the base, shortly peduncled, 8-15 mm in diam., globose or passiform, pinkish or greenish-yellow when ripe. Ripe fruits are eaten raw and also used as curry. Unripe fruits are made into vegetable. Figs ripen.

Fl. & Fr. : May-Nov.

Common, open and dry places. 4578.

Flacourtia indica (Burn. f.) Merr. (Flacourtiaceae) (V. Bilangara, Kandai ; E. Madagascarpum).

Deciduous small shrub. Flowers yellowish-green. Berry red or dark brown or pink, 6-10 mm in diam. Ripe fruits are eaten, somewhat sweet in taste and also made into jellies. tarts. Rarely leaves are also eaten raw,

Fl. & Fr. : Feb.-June.

Common, mixed forests. 4661.

Flacourtia jangomas (Lour.) Raeusch. (Flacourtiaceae) (V. Pachnala, Jamuna; E. Puneala plum).

Large evergreen small shrub. Flowers unisexual. Fruits green, turning brownish-purple or dark purplish when ripe, 1.8-2.2 cm long, obovoid. Ripe fruits are eaten, sweet-sour in taste and also made into sauce, pickles, tarts and preserves.

Fl. & Fr. : July-Jan.

Common. 4407.

Gardenia turgida Roxb. (Rubiaceae) (V. Thanera, Thunela). Fig. 27.

Small deciduous tree. Flowers dimorphic, fragrant. Berry grey or reddish-brown, mealy, ovoid or ellipsoid, 2.5-7.0 cm in diam. Unripe fruits are eaten after thoroughly boiling and cooking.

Fl. & Fr. : Mar.-Dec.

Uncommon, associated with *Shorea robusta* forest. 4438.

Garuga pinnata Roxb. (Burseraceae) (V. Titmer, Kherpat).

Small deciduous tree. Flowers yellow, slightly hairy. Drupe greenish-yellow, globose, 1.8-2.8 cm in diam., smooth, fleshy. Fruits are eaten raw, sour in taste, pickled and cooked as a vegetable.

Fl. & Fr. : Mar.-Dec.

Common, associated with *Shorea robusta* and *Anogeissus latifolia* forests. 4685.

Glycosmis cochinchinensis Pierre ex Engler (Rutaceae) (V. Bannimboo, Ghurbheli; E. Wild lemon). Fig. 10.

Evergreen shrub. Flowers white or yellowish, fragrant. Berry yellow or pale orange or white or blue, depressed-globose, 6-12 mm long, juicy. Ripe fruits are eaten, sweet and flavoury in taste.

Fl. & Fr. : Feb.-Sept.

Common, associated with *Shorea robusta* forest. 4600.

Gmelina arborea Roxb. (Verbenaceae) (V. Gambhari, Gumari; E. Malaya.bush beech, White teak).

Deciduous tree. Flowers brownish-yellowish, drupe ovoid or pyriform, orange-yellow when ripe, smooth, 1.8-2.5 cm long. Ripe fruits are eaten raw, sweetish aromatic in taste; fruits are thoroughly rubbed by hand to remove the rind, dried in sun, boiled and eaten.

Fl. & Fr. : March-June.

Common. 4487.

Holostemma ada-kodien Schult. (Asclepiadaceae) (V. Ranimarwi).

Glabrous twining shrub. Flowers purple-crimson within, silvery-white outside; follicles short, thick, linear-oblong, cylindric, 10-12.5 cm long, tapering to a blunt point, smooth. Fruits are eaten raw. Flowers contain sweet juice for cooling drink and hence, frequently used by the natives. The leaves and flowers are also cooked as vegetable.

Fl. & Fr. : July-Sept.

Common, climbing on *Lantana* sp. along the slopes. 4429.

Maesa argentea Wall. (Myrsinaceae) (V. Gogsa, Phusera).

Evergreen shrub. Flowers white or pale greenish-yellow. Berry pinkish or white, globose, about 4 mm in diam., succulent. Ripe fruits are eaten raw.

Fl. & Fr. : Apr.-Feb.

Common, ravines or in moist shady forest. 4422.

M. montana A. DC. (Myrsinaceae) (V. Gadchaina, Juindala, Kona). Fig. 28.

Large evergreen shrub. Flowers white, fragrant. Berry globose, pinkish, 3.5 mm in diam., succulent, pinkish white when ripe. Ripe fruits are eaten raw, sub-sweetish in taste.

Fl. & Fr. : Feb.-Dec.

Common, ravines and in open Oak and Pine forest. 4423.

Miliusa velutina Hook. f. & Thoms. (Annonaceae) (V. Guasal, Gidar-ruk, Domsal). Fig. 2.

Deciduous tree. Flowers greenish-yellow. Fruits blackish-purple or black, 1.5-1.8 cm in diam., ellipsoid. Ripe fruits are eaten.

Fl. & Fr. : Mar.-Oct.

Not common, associated with *Anogeissus latifolia*, *Diospyros melanoxylon* and *Shorea robusta* forest. 4671.

Moringa oleifera Lamk. (Moringaceae) (V. Sahajan, Saingina, Sundan ; E. Drumstick tree, Horse-radish tree).

Small deciduous tree. Flowers white or pink. Pods 22.5-45.0 × 1.2-1.8 cm, pendulous, 9-ribbed, slightly constricted between the seeds. Young leaves, flowers and green pods are thoroughly washed, boiled and cooked as vegetable. Unripe pods or green pods are also preserved as pickle. Incisions are made in the trunk or stem, from which exudes a reddish gum used as adulterant in many sweets. Gum is sold in the market.

Fl. & Fr. : Feb.-June.

Common. 4687.

Olex nana Wall. ex Benth. (Olacaceae) (V. Bent).

Small undershrub. Flowers white. Drupe globular, 1.2 cm in diam., including the accrescent fleshy scarlet calyx. Fruits though insipid, are eaten.

Fl. & Fr. : Apr.-June.

Common, dry grasslands. 4686.

O. scandens Roxb. (Olacaceae) (V. Dheniani).

Large stout, branched climber. Flowers white, fragrant. Drupe yellow, globose or ovoid, 1 cm in diam., fleshy ; ripe fruits are edible and also used for making *sherbet* or cooling drinks.

Common, damp shady or near river or riverine places. 4687.

Oroxylum indicum (L.) Kurz (Begoniaceae) (V. Tantia ; E. Indian trumpet flower).

Small deciduous tree. Flowers purple, fleshy, foetid. Capsule flattened, rigid, reddish-brown, curved, almost woody pod, 30-75 cm long, 6.2-8.5 cm broad. Young shoots and unripe fruits are cooked as vegetable. Flowers are eaten raw ; seeds are also made into flour and considered to be purgative.

Fl. & Fr. : June-Dec.

Uncommon, associated with *Terminalia belerica* and *Acacia catechu* forests. 4437.

Pavetta tomentosa Roxb. ex Sm. (Rubiaceae) (V. Bhaindami, Angari ; E. Indian pellet shrub, White paveta).

Large shrub or small tree. Flowers white, fragrant. Berry globose, green turning black on maturity, 5-8 mm in diam. Ripe fruits and flowers are eaten raw.

Fl. & Fr. : Mar.-Oct.

Common, moist shady places. 4594.

Phyllanthus emblica L. (Euphorbiaceae) (V. Aonla, Amla ; E. Indian gooseberry, Emblic, Myrobalan).

Tree. Flowers greenish-yellow. Drupe globose, 1.5-2.5 cm in diam., obscurely smooth, 6-lobed with verticle lines, fleshy containing a large stony seed. Ripe fruits are eaten raw, and also made into pickles ; fruits are taken as sauce in headache ; used as a purgative and also in hot summers, to quench thirst.

Fl. & Fr. : Mar.-June.

Common, associated with *Shorea robusta* and *Anogeissus latifolia* forest. 4858.

Picrasma quassioides (D. Don) Bennett. (Simaroubaceae) (V. Karwi, Tithai).

Deciduous tree. Flowers green. Fruits red when ripe, supported by enlarged leathery sepals and petals. Ripe fruits are edible.

Fl. & Fr. : Apr.-Sept.

Common, shady forest. 4685.

Premna barbata Wall. ex Schau (Verbenaceae) (V. Agnui, Bakkarchu, Gauntia)

Small deciduous tree. Flowers greenish-white. Fruits globose, 4-6 mm in diam., purplish black, seated on the persistent enlarged calyx. Ripe fruits are eaten raw, sweetish, aromatic in taste. Leaves and tender shoots are eaten in curries. Bark is eaten during famine.

Fl. & Fr. : June-July.

Common in *Acacia catechu* and *Anogeissus latifolia* forests. 4440.

Pygmaeopremna herbacea (Roxb.) Molden. (Verbenaceae) (V. Bharangi).

Undershrub. Flowers greenish-white or pale-yellow. Drupe glossy, globose, 5 mm in diam., black when ripe. Ripe fruits are eaten raw, sweet in taste. Leaves are cooked as vegetable.

Fl. & Fr. : May-July.

Uncommon, moist and shady places. 4861.

Randia uliginosa DC. (Rubiaceae) (V. Pindalu, Mainphal; E. Grey emetic nut).

Small tree. Flowers white or creamy coloured. Berry ovoid, about 4.8-6.5 cm long, yellowish-brown, smooth. Fruits are eaten after thoroughly roasting or cooking.

Fl. & Fr. : Apr.-May.

Common, dry open places. 4413.

***Rubia manjith** Roxb. ex Flem. (Rubiaceae) (V. Majeetha; E. Indian madder).

Perennial climber. Flowers creamy-yellow. Fruits globose, bluish-black, 3-5 mm in diam. Ripe fruits are eaten raw, sweet in taste.

Fl. & Fr. : July-Dec.

Common, open and shady slopes, climbing on *Prinsepia utilis*, *Rosa* sp. and *Berberis* sp. forests. 4587.

Sageretia filiformis (Roth. ex Schult.) G. Don (V. Agalia, Abinkund, Baghmari, Gonta).

Large often climbing shrub or small tree. Flowers greenish-yellow or reddish. Fruits black or purplish-red when ripe, succulent.

sub-globose, 3-7 mm long. Fruits are eaten, sweet in taste.

Fl. & Fr. : June-Nov.

Uncommon. 4889.

S. thea (Osbeck) Johnston (V. Khadgu, Kutku, Kuricha, Kuthu).

Evergreen shrub. Flowers green. Fruits black or dark brown, succulent, about 4 mm long. Fruits are edible, sweet in taste. Leaves are also used as substitute for tea.

Fl. & Fr. : May-Dec.

Uncommon. 4690.

Saurauia nepaulensis DC. (Actinidiaceae) (V. Gogina, Gogin, Ratendu).

Small evergreen tree. Flowers pink. Berry green, 1 cm long, fleshy, depressed globose, 4-5-lobed. Ripe fruits are eaten, sweet in taste.

Fl. & Fr. : Apr.-Aug.

Common, moist valleys sometimes in *Pinus* forest. 4473.

Schleichera oleosa (Lour.) Oken. (Sapindaceae) (V. Kusum; E. Ceylon oak, Honey tree, Gum lac tree, Macassar oil tree).

Small tree. Flowers greenish-yellow. Fruits ovoid, 1.8-3.2 cm long, with fleshy pulp. The fleshy aril around the seeds are edible, pleasant, acrid in taste. Raw fruits are pickled.

Fl. & Fr. : Mar.-Sept.

Common in *Shorea robusta* and *Anogeissus latifolia* forests. 4575.

***Scurrula cordifolia** (Wall.) G. Don (Loranthaceae) (V. Banu, Banda, Inar).

Parasitic shrub. Flowers pale-yellowish. Berry obconic, yellow, stellately pubescent, about 6 mm long. Ripe fruits are chewed as areca nut.

Fl. & Fr. : April-Nov.

Common, on *Quercus leucotrichophora*, *Q. flouribunda* and *Phyllanthus emblica* trees. 4580.

Sechium edule (Jacq.) Sw. (Cucurbitaceae)

(V. Uskas ; E. Chayote, Chocho, Christophine, Prickly pear).

Perennial climber. Flowers greenish-yellow. Ripe fruit joints, buds and flowers are thoroughly washed, boiled and cooked as vegetable. Joints and buds are dried and stored for later use.

Fl. & Fr. : July-Dec.

Wild as well as cultivated, along ravines and streams. 4485.

Semecarpus anacardium L. (Anacardiaceae) (V. Bhilao, Bhilawa ; E. The marking-nut tree, Oriental cashew-nut).

Small deciduous tree. Flowers greenish-white. Drupe obliquely ovoid or oblong, shining black, seated in bright orange coloured fleshy receptacle. The orange coloured fleshy cup or hypocarp is eaten ; it is acrid and astringent, roasted, it is somewhat like roasted apples and when dry somewhat like dates.

Fl. & Fr. : June-Feb.

Common, associated with *Shorea robusta* and *Anogeissus latifolia* forests. 4561.

Solanum anguivi Lam. (Solanaceae) (V. Banbhatta, Bhat kataya). Fig. 13.

Perennial prickly shrub. Flowers blue. Fruits globose, orange-yellow, 7-10 mm in diam. Fruits are cooked as vegetable, in curry and sauce preparation.

Fl. & Fr. : Aug.-Feb.

Common, waste places, roadsides. 4700.

S. sisymbriifolium Lam. (Solanaceae) (V. Jangli bhatta).

Tall prickly herb. Flowers blue. Fruits globose, orange-red or red, 5-12 mm in diam. Ripe fruits are eaten raw, sweet in taste.

Fl. & Fr. : Feb.-July.

Common, waste places. 4688.

S. torvum Sw. (Solanaceae) (V. Bhurat, Titbegan).

Tall spiny herb. Flowers white. Fruits 1 cm in diam. Fruits are cooked as vegetable.

Fl. & Fr. : Nov.-June.

Common, waste places, forest edges. 4689.

Spondias pinnata (L.) Kurz (Anacardiaceae) (V. Amara, Ambara ; E. Indian hog-plum, wild mango).

Small deciduous tree. Flowers pinkish-green or greenish-white, fragrant. Drupe yellow, 3.5-5.0 cm long, succulent, smooth containing a large somewhat fibrous stone surrounded by the soft juicy mesocarp. The aromatic flower buds used as agreeable curry. Fruits are made into sauce, pickles and jams. The yellow ripe fruits with sub-sweetish, flavoured juicy flesh are eaten raw and made into curry. Seed is also eaten and tasty.

Fl. & Fr. : Mar.-Oct.

Common, moist shady places. 4686.

Streblus asper Lour. (Urticaceae) (V. Barranki, Jindi, Sihora).

Tree. Berry sub-globose, about 5 mm in diam., yellow when ripe. Ripe fruits are eaten, sweet in taste.

Fl. & Fr. : Mar.-July.

Common, along river banks and in hedges near villages. 4627.

Toddalia asiatica (L.) Lam. (Rutaceae) (V. Chin-gatti ; E. Forest pepper, Wild orange tree).

Erect, rambling sarmentose usually prickly shrub. Flowers pale greenish-yellow. Berry orange, sub-globose, 0.5-1.2 cm in diam. Ripe fruits are edible and also pickled.

Fl. & Fr. : Feb.-June.

Common, moist ravines or in swampy places. 4684.

Tribulus terrestris L. (Zygophyllaceae) (V. Gokhuru ; E. Land-caltrops).

Prostrate or decumbent, silky hairy herb. Flowers yellow. Fruits globose, consisting of

5 hairy woody cocci, hairy or glabrescent. Flour prepared by grinding the fruit is consumed by *Buxas* tribe during scarcity. Stems and young leaves are cooked as vegetable.

Fl. & Fr. : May-Oct.

Common, open grassy slopes, along road sides. 4856.

Trichosanthes cucumerina L. (Cucurbitaceae) (V. Jangli chachinda).

Scandent climber. Flowers white. Fruits ovoid, conical, 3.0-5.0 cm in diam. Unripe fruits are cooked as vegetable.

Fl. & Fr. : Aug.-Oct.

Common, associated with *Shorea robusta* forest, scrub jungles. 4690.

Wattakaka volubilis (L.) Stapf. (Asclepiadaceae) (V. Dudhiyabel).

Deciduous large twining shrub. Flowers green or yellowish-green. Follicles solitary or double, lanceolate, ribbed, velvety when young. Leaves and rind of unripe fruits are cooked as vegetable during drought period.

Fl. & Fr. : Apr.-May.

Common, associated with *Acacia catechu* forest. 4432.

Withania somnifera (L.) Dunal (Solanaceae) (V. Kusth gandha).

Erect, much branched shrub. Flowers greenish or light yellow. Berry globose, red when ripe, 3-5 mm in diam., 5-angled, 0.8-2.0 cm long. Ripe fruits are eaten.

Fl. & Fr. : Mar.-Aug.

Common, dry waste places. 1102.

Xeromphis spinosa (Thunb.) Keay (Rubiaceae) (V. Rara, Maidul, Raadu ; E. Emetic nut).

Deciduous small tree. Flowers yellow. Berry globose or obovoid, yellow when ripe, aromatic, 2.4-3.2 cm in diam. Ripe fruits are eaten after thoroughly roasted or cooked. Young leaves are eaten as vegetable.

Fl. & Fr. : Feb.-Apr.

Common, associated with *Anogeissus latifolia* and *Acacia catechu* forests. 4809.

Zanthoxylum armatum DC. (Rutaceae) (V. Timru ; E. Wingleaf prickly ash).

Evergreen or sub-deciduous shrub. Flowers yellow. Fruits red, globose, 3-6 mm in diam., aromatic. The pungent fruits are used as condiment.

Fl. & Fr. : Apr.-Oct.

Common, open and dry places, associated with *Berberis* sp. 4864.

(2) Sub-temperate and temperate :

Aesculus indica Colebr. ex Cambess. (Hippocastanaceae) (V. Bankhor, Paamal, Panger ; E. Himalayan horse chestnut).

Large deciduous tree. Flowers white or yellow. Capsule rough outside, ovoid, 2.5-4.5 cm long, dark brown. Kernels are made into flour, fried with butter oil (*ghee*) and prepared in to chapatis during famine.

Fl. & Fr. : May-Nov.

Common, associated with Oak-Rhododendron forest, cultivated. 4588.

Benthamedia capitata (Wall.) Hara (Cornaceae) (V. Bhamora ; E. Himalayan strawberry).

Small evergreen tree. Flowers white. Fruits depressed globose, dark purple or partly orange when ripe, 0.7-1.5 cm long, glabrous, succulent. Ripe fruits are eaten raw and made into preserves.

Fl. & Fr. : June-Nov.

Common, associated with Oak-Rhododendron forests. 4723.

Berberis lycium Royle (Berberidaceae) (V. Chatroi, Daruhaldi, Kingor ; E. Indian berberry). Fig. 4.

Evergreen, rigid shrub. Flowers pale yellow. Berry violet, about 5 mm long, ovoid, glaucous, edible, sweet-sour in taste.

Fl. & Fr. : Mar.-July.

Common. 4630.

B. pachyacantha Kohne (Berberidaceae) (V. Chotar).

Deciduous shrub. Flowers yellow. Berry

blue-black, about 1 cm long, ovoid, edible, sweet-sour in taste.

Fl. & Fr. : Apr.-Dec.

Common, associated with *Quercus semecarpifolia* forest. 4634.

Bosia amherstiana (Moq.) Hook. f. (Amaranthaceae) (V. Bhengoi, Kotibilga). Fig. 30.

Glabrous shrub. Flowers green with white edges. Young shoots are used as vegetable, cooked and fried in butter oil (*ghee*).

Fl. & Fr. : May-Nov.

Uncommon, shady forest. 4625

Carum carvi L. (Apiaceae) (V. Shiajira ; E. Caraway).

Glabrous herb with terete stem. Flowers white. Fruits oblong, glabrous. Dried fruits are used as condiment.

Fl. & Fr. : May-Sept.

Common, cultivated in kitchen garden. 4691.

Castanea sativa Mill. (Fagaceae) (V. Hinguri ; E. Sweet chestnut).

Tree. Fruits densely spinous, splitting into 2-4 valves. Seeds 1-3, boiled and eaten.

Fl. & Fr. : Mar.-Oct.

Common, cultivated. 4692.

Castanopsis tribuloides (J. E. Smith) A. DC. (Fagaceae) (V. Ghiseri, Ghogsa, Katonj, Tumari). Fig. 42.

Small evergreen tree. Nut acorn like, 10 mm long, smooth, enclosed in scaly cup with branching spines, 1-3 together. Fruits (kernels) are eaten either raw or after roasting.

Fl. & Fr. : June-Dec.

Common, often cultivated. 4492.

Citrus medica L. (Rutaceae) (V. Limbba, Madkakar ; E. Citron).

Evergreen small tree. Flowers white. Fruits yellow when ripe, ovoid-oblong or globose, 4.5-7.5 cm long ; pulp edible. The peel and pulp is made into preserves and marmalades.

Fl. & Fr. : Dec.-April.

Common, sometimes cultivated. 4693.

Cornus macrophylla Wall. (Cornaceae) (V. Khaysa, Khagshi).

Small deciduous tree. Flowers pale yellowish-white. Fruits globose, black when ripe, 3-7 mm in diam. Ripe fruits are occasionally eaten raw.

Fl. & Fr. : Feb.-Apr.

Common, riverine and shady moist places. 4724.

Corylus jacquemonti Decne. (Corylaceae) (V. Bhotiya badam, Kabasi, Datheloo ; E. Turkish hazelnut).

Small deciduous tree. Nut 1.2-1.8 cm long, globose, very hard, enclosed in glandular hairy lobate scales and bracts. Kernels are eaten. An edible oil extracted from the nuts.

Fl. & Fr. : Apr.-Sept.

Common, semi-domesticated. 4580.

Elaeagnus umbellata Thunb. (Elaeagnaceae) (V. Gewaii, Giyii ; E. Silverberry).

Deciduous shrub. Flowers dull yellowish-white, fragrant. Fruits ovoid, 0.5-1.2 cm long, succulent, red or orange. Fruits are eaten, sour in taste and also made into pickles.

Fl. & Fr. : April-Sept.

Common, near streams and swampy places. 4508.

***Ficus hederacea** Roxb. (Moraceae) (V. Beduli).

Climbing evergreen shrub. Figs 1.0-1.5 cm in diam., globose or ovoid, orange-yellow or pinkish, finally black with distant pale dots when ripe. Ripe fruits are eaten. Figs ripen during July-Nov.

Common, rocky places. 4577.

Holboellia latifolia Wall. var. **angustifolia** (Wall.) Hook. f. (Lardizabalaceae) (V. Gumphal).

Climber. Flowers purplish-green, scented. Berries 1-3, funnel like, first green, black

after ripening, 4.0-10.0 cm, oblong, fleshy. Mature fruits are eaten, sweet in taste.

Fl. & Fr. : Apr.-Nov.

Uncommon, climbing on *Rhododendron arboreum* and *Pyrus pashia* trees. 4523.

Holboellia latifolia Wall. var. **latifolia** Hook. f. (Lardizabalaceae) (V. Gumphal, Ramkepa). Fig. 6.

Climber. Flowers monoecious, dark purple-brown, scented. Berry 1-3, first green, black when ripe, 5.0-15.0 cm long, oblong. Mature fruits are edible, sweet in taste.

Fl. & Fr. : Apr.-Dec.

Uncommon, climbing on *Rhododendron arboreum*, *Morus serrata* and *Pyrus pashia* trees. 4524.

Jasminum dispersum Wall. (Oleaceae) (V. Nun Dekra, Sunjoi).

Climbing shrub. Flowers white, sometimes tinged with pink. Fruits black, oval. Fruits are eaten and sub-sweetish with slightly bitter taste.

Fl. & Fr. : Apr.-Oct.

Common, undergrowth shady forest. 4694.

Mahonia acanthifolia G. Don (Berberidaceae) (V. Bakil, Haldia, Ban-totar, Guram, Khoru). Fig. 5.

Evergreen shrub. Flowers yellow, scented. Berry dark purple or blue black, about 7 mm long, ovoid, glaucous. Fruits are eaten, sour in taste, considered diuretic and demulcent in dysentery.

Fl. & Fr. : Feb.-June.

Not common, riverine and shady places. 4633.

Malus baccata (L.) Borkh. var. **himalaica** (Maxim) Scheneidr (Rosaceae) (V. Ban-mehar, Leik-mehar, Moli ; E. Siberian crab apple). Fig. 14.

Small deciduous tree. Flowers white. Fruits red, ovoid, or globose, 0.6-1.0 cm in diam., fleshy with 2-5-celled stone. Ripe fruits are eaten raw, acrid in taste ; unripe fruits are made into sauce and jam.

Fl. & Fr. : Apr.-Nov.

Not common, associated with Oak-Rhododendron forests. 4310.

Melothria heterophylla (Lour.) Cogn. (Cucurbitaceae) (V. Ban kakri, Gwal-kakri).

Perennial scandent climber. Flowers pale-yellow or white. Fruits glabrous, pubescent or tomentose, oblong, ovoid, cylindric, 2.5-6.0 cm long, bright red when ripe, tapering towards the apex. Fruits are eaten raw or cooked as vegetable. Roots are boiled and eaten.

Fl. & Fr. : Mar.-Sept.

Common, climbing on *Berberis* sp., *Pyrus* sp. and other shrubs in Oak-Rhododendron forests. 4582.

M. maderaspatana (L.) Cogn. (Cucurbitaceae) (V. Agumarki, Gwal-kakri).

Rough climber. Flowers yellow-white. Fruits ovoid-globose, green with white bands and hairy at first, turning to red on maturity. Ripe fruits are eaten raw and unripe fruits are cooked as vegetable.

Fl. & Fr. : Apr.-Dec.

Common, grassy localities. 4700.

Momordica dioca Roxb. ex Willd. (Cucurbitaceae) (V. Jangli karela ; E. Small bitter spines).

Foetid climber. Fruits ovoid, narrowed at both ends, 2.2-7.5 cm long, with soft spines. Unripe fruits are cooked as vegetable or in curries. Tuberous roots are also eaten as vegetable.

Fl. & Fr. : July-Oct.

Common, river banks, ravines and crevices or rocks. 4699.

Morus alba L. (Moraceae) (V. Shahtut ; E. White mulberry).

Medium sized deciduous, monoecious tree. Fruits white or red. Fruits are eaten, sweet in taste.

Fl. & Fr. : Mar.-June.

Common, planted near villages. 4695.

Morus australis Poir. (Moraceae) (V. Tut).

Small tree. Fruits black when ripe. Fruits are eaten, sweet in taste.

Fl. & Fr. : Apr.-June.

Common, planted near villages. 4696.

M. macrocarpa Miq. (Moraceae) (V. Kimu).

Deciduous tree. Fruiting spikes white or red. Fruits are edible, sweet in taste.

Fl. & Fr. : Mar.-June.

Common, planted. 4697.

Myrica esculenta Buch.-Ham. ex D. Don (Myricaceae) (V. Kaphal; E. Bey berry, Box myrtee). Figs. 40 and 41.

Tree. Drupe stalkless, ovoid, red, succulent, granulate, about 2 cm in diam. Ripe fruits are sour-sweet in taste, much relished with salt and mustard and also make a refreshing drinks (*sherbet*).

Fl. & Fr. : June-Aug.

Common, associated with Oak-Rhododendron forest. 4453.

***Osyris wightiana** Wall. ex Wt. (Santalaceae) (V. Bakrolya).

Erect shrub. Fruits globose, orange-red. Ripe fruits are eaten and sub-sweetish in taste.

Fl. & Fr. : Aug.-Oct.

Common, shady forest. 4572.

Prunus cornuta (Wall. ex Royle) Steud. (Rosaceae) (V. Jamnai, Bagwaly; E. Himalayan bird cherry).

Small deciduous tree. Flowers white. Drupe first red turning to purplish black when ripe, globose about 1.5 cm in diam. Ripe fruits are eaten raw, sour in taste.

Fl. & Fr. : Apr.-Oct.

Common, associated with *Quercus flouribunda*, *Sorbus cuspidata*, *Acer caesium* forests. 4501.

P. venosa (Rosaceae) (V. Gadh-arū, Aria).

Small deciduous tree. Flowers white. Drupe red becoming black when ripe, globose, about 1 cm in diam. Fruits are eaten raw.

Fl. & Fr. : May-Nov.

Common, near riverine places. 849.

Pyrus lanata D. Don (Rosaceae) (V. Galao, Maul, Pahi, Thulmole, Pothi). Fig. 22.

Small deciduous tree. Flowers white, fragrant. Fruits orange-yellow, spotted with red and speckled with small dots, about 2.5 cm in diam., globose or pyriform. Ripe fruits are eaten raw, sweet in taste, and also made into sauce and jams. This tree is dwindling due to indiscriminate exploitation (fodder, fuel and charcoal, house construction, agricultural implements etc.) by the natives.

Fl. & Fr. : Apr.-Aug.

Not common, associated with *Prunus cornuta*, *Acer* and *Ribes* forests. 4511.

Quercus leucotrichophora A. Camus (Fagaceae) (V. Banj, Liqual; E. Grey oak, Himalayan white oak).

Evergreen tree. Acorns single or in pairs at first covering the whole nut but when mature covering only half. Acorns are taken or ground with flour during famine.

Fl. & Fr. : Apr.-Dec.

Common, often associated with *Rhododendron arboreum*, *Myrica esculenta*, *Benthamedia capitata* forests. 4856.

Rhus semialata Murray (Anacardiaceae) (V. Dasmila, Damphal, Dhamila, Titmulya). Fig. 12.

Small deciduous tree. Flowers whitish or yellowish-green, fragrant. Drupe greenish-yellow or dark reddish-brown, pubescent, globose, 4-6 mm in diam., compressed. Fruits are edible and sour in taste and are also ground to prepare sauce.

Fl. & Fr. : July-Dec.

Common, associated with Oak-Rhododendron forest. 4562.

Ribes glaciale Wall. (Grossulariaceae) (V. Himoch, Kinlai, Kyanel, Gwaldum; E. Yellow current).

Erect deciduous shrub. Flowers green. Berry globose or ovoid, 0.5-0.8 cm in diam., succulent, purplish red. Ripe fruits are edible, sour in taste. Fruits are made into pickles and sauce.

Fl. & Fr. : May-Oct.

Common, associated with *Quercus semecarpifolia* and *Rhododendron arboreum* forests. 4543.

Rubus foliolosus D. Don (Rosaceae) (V. Hissol).

Large rambling shrub. Flowers light pink. Fruits pink, globose, 0.8-2.0 cm in diam. Ripe fruits are eaten raw, sour-sweet in taste.

Fl. & Fr. : Apr.-Aug.

Common, associated with Oak-Rhododendron forests. 4512, 842.

R. macilentus (Rosaceae) (V. Anchu, Insula, Rajalu).

Trailing evergreen prickly shrub. Flowers white. Fruits yellow or orange, globose, 0.8-1.2 cm in diam., juicy. Ripe fruits have an agreeable flavour, sweet in taste and are eaten raw.

Fl. & Fr. : Apr.-Aug.

Common, associated with Oak-Rhododendron forests. 1083.

R. niveus (Rosaceae) (V. Kala-hissar, Kayalcha, Katrana; E. Mysore raspberry, Mahabaleshwar raspberry).

Large rambling shrub. Flowers pink. Fruits globose, orbicular or broadly obovate, 1.2-2.0 cm in diam., black when ripe, fleshy, juicy. Ripe fruits are eaten raw, sour-sweet in taste and also made into sauce.

Fl. & Fr. : Mar.-Oct.

Common. 4504.

Schisandra grandiflora (Wall.) Hook. f. (Schisandraceae) (V. Agali, Chimgadi, Jogna). Fig. 1.

Woody climber. Flowers white or cream coloured or pinkish-white, fragrant. Fruits

with numerous scarlet or bright red carpels attached to the fleshy axis, drooping spike 8.0-10.0 cm long, ovoid. Ripe fruits are eaten, sour-sweet in taste.

Fl. & Fr. : Apr.-Nov.

Uncommon, associated with Oak-Rhododendron forest. 4506.

Selinium wallichianum (DC.) Raizada et Saxena (Apiaceae) (V. Thoya).

Tall herb with fistular stems. Flowers white. Fruits elliptic, ovoid, glabrous, flattened, ridges all winged. Fruits are used for flavouring food either raw or cooked or fried. Young shoots and leaves cooked as vegetable.

Fl. & Fr. : Aug.-Oct.

Common, grassy slopes. 5166.

Sorbus cuspidata (Spach.) Hedlund (Rosaceae) (V. Papamoli, Moli, Rikhmai; E. Himalayan white beam). Fig. 21.

Small deciduous tree. Flowers white. Fruits greenish-yellow often tinged with red and covered with small brown spots, 1.2-2.0 cm in diam., globose. Ripe fruits are eaten raw, sweet in taste, and also made into jams and pickles.

Fl. & Fr. : May-Dec.

Common, associated with Oak-Rhododendron forest. 4502.

Stranvaesia nussia (D. Don) Decne (Rosaceae) (V. Gadhmelu, Garhmehal).

Evergreen or sub-deciduous tree. Flowers white. Fruits orange-yellow, woolly tomentose, globose or ovoid, 0.6-0.8 cm in diam. Ripe fruits are eaten raw, sweet in taste.

Fl. & Fr. : Apr.-Dec.

Common, associated with *Myrica esculenta*, *Symplocos* sp., *Quercus* sp., forests. 4514.

***Taxillus vestitus** (Wall.) Denscher (Loranthaceae) (V. Banda).

Parasitic shrub. Flowers light pale-yellow, villous. Berry almost cylindric, bright orange or yellow, 1.1 cm long. Ripe fruits are eaten raw; used for chewing.

Fl. & Fr. : June-Sept.

Common, epiphyte on *Quercus flouribunda* and *Pyrus pashia* trees. 4581.

Taxus baccata L. ssp. **wallichiana** (Zucc.)

Pilger (Taxaceae) (V. Thuner, Thuniara ; E. Himalayan yew). Fig. 43.

Small evergreen tree. Fruits composed of the enlarged cup-shaped disk, ultimately becomes succulent and bright red, about 6-10 mm in diam. Fruit (fleshy part of the fruit around the seed) is eaten, sweet in taste. Small pieces of the bark, with salt and butter oil (ghee) are used in a tea-like preparation that is supposed to give strength and vigour. Bark is largely exported to the plains.

Fl. & Fr. : Apr.-Nov.

Common, associated with *Quercus semicarpifolia*, *Sorbus foliolosa*, *Abies pindrow* forests. 4719.

Viburnum cotinifolium D. Don (Sambucaceae)

(V. Ghinwa, Ghenu, Bansura, Matyaana, Gabain ; E. Cranberry bush).

Deciduous shrub. Flowers white, tinged with pink. Drupe oblong, compressed, 0.8-1.2 cm long, first red ripening to black, shining, glabrous. Ripe fruits are eaten raw, sweet in taste.

Fl. & Fr. : Apr.-Oct.

Common, associated with Oak-Rhododendron forest. 4521.

V. foetens Decne (Sambucaceae) (V. Ghinurya, Tileen, Telnu, Thella, Shikgolai ; E. Cranberry bush).

Large deciduous shrub. Flowers white, tinged with light pink, fragrant. Drupe ellipsoid, little compressed, dark red, 1.2-1.6 cm long. Ripe fruits are eaten raw, sour in taste.

Fl. & Fr. : Mar.-Sept.

Common, associated with Oak-Rhododendron forest. 4519.

V. grandiflorum Wall. ex DC. (Sambucaceae) (V. Telanu, Thekla).

Deciduous shrub. Flowers white, tinged with pink. Ripe fruits are eaten raw.

Fl. & Fr. : Mar.-Aug.

V. mullaha Buch.-Ham. ex D. Don (Sambucaceae) (V. Maleo, Malayo, Titmolia ; E. Cranberry bush). Fig. 26.

Deciduous small shrub. Flowers white. Drupe broadly oblong, flat, grooved on both faces, shining red. Ripe fruits are eaten raw and made into sauce. Ripe fruits are collected and dried in sun, stored for off season and used for flavouring.

Fl. & Fr. : June-Dec.

Common, associated with Oak forest. 4518.

Vitis parvifolia Roxb. (Vitaceae) (V. Baraem ; E. Himalayan wild vine).

Perennial, deciduous climber. Flowers green, fragrant. Fruits black, globose, 5.5-10.5 cm in diam. Ripe fruits are edible, sweet and aromatic in taste.

Fl. & Fr. : Apr.-Aug.

Common, mixed with *Pinus* sp. and Oak forest. 4684.

(3) *Alpine/cold arid desert habitat*

Angelica archangelica L. (Apiaceae) (V. Choru, Cheeming, Gandrayan).

Tall glabrous herb. Flowers white or purple. Fruits glabrous, flattened, oblong, 1.2 × 0.6 cm.

Fruits and aromatic roots are added to food to give flavour. Roots are used as seasoning agent for curry or *dal* to provide good strength and vigour to women after delivery. This plant is on the verge of extinction due to indiscriminate use by the natives.

Fl. & Fr. : Aug.-Dec.

Common, alpine meadows. 4822.

Berberis chitria Lindl. (Berberidaceae) (V. Chotar, Kingor, Phachang ; E. Indian bergerry). Fig. 3.

Deciduous shrub. Berry red, oblong,

narrowed both ends, 0.6-0.9 cm long. Ripe fruits are eaten raw, also taken after drying in sun. Wrinkled fruits with high sugar contents and firm flesh are edible. Sauce is also prepared from its flower buds.

Fl. & Fr. : May-Oct.

Common, associated with *Quercus* sp. forest. 617, 4501.

Berberis lycium Royle (Berberidaceae) (V. Chatroi, Daruhaldi, Kingor; E. Indian berberry). Fig. 4.

Evergreen, rigid shrub. Flowers pale-yellow. Berry violet, about 5 mm long, ovoid, glaucous. Fruits are edible, sweet-sour in taste.

Fl. & Fr. : Mar.-July.

Common. 4630.

***Bupleurum candolii** Wall. ex DC. (Apiaceae) (V. Banjcera).

Perennial herb. Flowers yellow. Fruits ovoid, ridges distinct, 5 mm long. Fruits and roots are eaten raw and also used as condiment.

Fl. & Fr. : July-Dec.

Occasional, open dry places. 4604.

***B. falcatum** L. var. **manginatum** (Wall. ex DC.) Cl. (Apiaceae) (V. Jangli jeera, Kalijawar; E. Sickle leaved, Hare's ear).

Glabrous herb. Flowers yellow. Fruits oblong, about 8 mm long, ridges distinct, brown sometimes green when ripe. Ripe fruits and dried roots are used as condiment.

Fl. & Fr. : July-Oct.

Fairly common, open dry slopes. 4603.

Cicer microphyllum Benth. (Fabaceae) (V. Jangli chana, Chana).

Diffuse pubescent herb. Flowers violet. Pods linear-oblong, densely pubescent. Fruits and young leaves cooked as vegetable; seeds are used as pulse.

Fl. & Fr. : July-Oct.

Frequent, near screes and agricultural field margins. 4698.

Ephedra gerardiana Wall. ex Stapf. var. **gerardiana** (Ephedraceae) (V. Somlata; E. Ephedrene).

Densely tufted shrub. Fruits ovoid, red, succulent. Ripe fruits are eaten raw.

Fl. & Fr. : July-Aug.

Common, open rocky places. 4673.

***Gaultheria trichophylla** Royle (Ericaceae) (V. Bhuinala, Jheri, Bher; E. Wintergreen, Checker beery).

Prostrate undershrub. Flowers light pink or white. Capsules pulpy or succulent, sky blue, 8-12 mm in diam. Ripe fruits are eaten raw, sweet and aromatic in taste. Rarely mature leaves are steeped for tea.

Fl. & Fr. : June-Sept.

Abundant, open grassy slopes along with mosses. 4529.

Hippophae rhamnoides Serv. ssp. **salicifolia** (D. Don) Serv. (Elaeagnaceae) (V. Amali, Aameel, Tarwa; E. Sea-buckthorn, Sallow-thorn). Fig. 31.

Deciduous thorny shrub or small tree. Flowers monoecious, appearing just before or with the leaves. Fruits ovoid, 0.8 cm in diam., juicy, ranged along the stems. Fruits are edible, acidic in taste and preserved in boiling mustard oil, used as pickles and marmalades.

Fl. & Fr. : Mar.-Dec.

Fairly common, river banks, wetland sides and damp places. 4522.

***H. tibetana** Schlecht. (Elaeagnaceae) (V. Ames, Chuk).

Densely branching deciduous shrub. Flowers stalkless, yellow. Fruits oblong or globose, orange-yellow or scarlet, ranged along the stem. Fruits are much acidic, boiled with sugar or jaggery to form palatable preserves.

Fl. & Fr. : Aug.-Dec.

Common, dry inner ranges bordering streams, screes. 4444.

Lonicera angustifolia Wall. ex DC. (Caprifoliaceae) (V. Gulnar, Banchula, Banchilu, Matlai; E. Honey suckle, Water berry). Fig. 25.

Deciduous shrub. Flowers white. Berry ovoid, red, translucent when ripe, 4-8 mm long. Ripe fruits are eaten raw, sour in taste.

Fl. & Fr. : May-Nov.

Common, associated with Oak-Rhododendron forest. 791.

Podophyllum hexandrum Royle (Podophyllaceae) (V. Ban-Kakari; E. Indian podophyllum). Fig. 7.

Perennial, succulent herb. Flowers white or pink or purplish-white, cup-shaped. Berry red, 2.5-6.5 cm, ellipsoid. Ripe fruits are eaten. Fruits and seeds are used in fermenting local liquor.

Fl. & Fr. : Apr.-Oct.

Rare, undergrowth *Quercus semecarpifolia* and *Q. dilatata* trees. 4525.

***Prunus jacquemontii** Hook. f. (Rosaceae) (V. Kursang, Targui).

Deciduous shrub. Flowers pink. Fruits 2.5-3.0 cm long, ovoid, bright red. Fruits are eaten raw.

Fl. & Fr. : May-Aug.

Not common, near open stony places and screes. 4671.

Ribes alpestre Wall. ex Decne (Grossulariaceae) (V. Himoch, Chapchu, Lipchi, Imli; E. The Gooseberry, Asian Gooseberry). Fig. 23.

Stiff, small deciduous armed shrub. Flowers white or greenish. Berry globular or ovoid, about 1 cm long, dull red. Ripe fruits are edible, sour in taste.

Fl. & Fr. : May-Sept.

Common, dry ranges of the hills along with *Pinus excelsa* and *Cedrus deodara* forests 4542.

R. himalense Royle ex Decne (Grossulariaceae) (V. Kim-kolia, Kaladani; E. Red current).

Deciduous pubescent or glabrous, unarmed shrub. Flowers greenish-yellow or brownish-pink. Fruits red or black. Ripe fruits are eaten raw and sour-sweet in taste; also made into pickles or preserves.

Fl. & Fr. : May-Oct.

Not common, associated with *Sorbus lanata*, *S. foliolosa* and *Prunus cornuta* forests. 4693.

Rosa macrophylla Lindl. (Rosaceae) (V. Kunja, Dand-kunja, Danda-kujja, Dudeloo). Fig. 16.

Erect, deciduous, prickly shrub. Flowers pink or white. Fruits flask-shaped, red, 1.5-4.0 cm long, fleshy, glandular-hairy. Ripe fruits are edible, sour-sweet in taste, and also made into sauce.

Fl. & Fr. : Apr.-Nov.

Common, associated with *Prunus cornuta*, *Abies pindrow* and *Quercus semecarpifolia* forests. 4516.

R. sericea Lindl. (Rosaceae) (V. Kunja, Kujja, Rangel, Dhur-kunja, Saipanli, Dhauli-kunja). Fig. 17.

Erect, prickly shrub. Flowers white or creamy, fragrant. Fruits bright red, subglobose or ovoid, 1.5-2.5 cm in diam. Ripe fruits are eaten raw, sour-sweet in taste, and also made into sauce.

Fl. & Fr. : Apr.-Nov.

Common, open slopes. 4509.

Rubus nepalensis (Hook. f.) Kuntze (Rosaceae) (V. Gangoor, Lal-Hissol, Kailashi kaphal).

Diffused perennial hairy herb. Flowers white. Fruits red, globose, 1.5-2.2 cm in diam. Ripe fruits are eaten raw, sweet-sour in taste and also made into sauce and preserves.

Fl. & Fr. : June-Nov.

Common, Oak-Rhododendron forests and moist alpine meadows. 4513.

Sorbus aucuparia L. (Rosaceae) (V. Moli; E. European mountain ash, Rowan). Fig. 18.

Small tree. Flowers white. Fruits red, globose, 0.8-1.2 cm in diam. Ripe fruits are eaten raw, sour-sweet in taste, and also made into sauce.

Fl. & Fr. : June-Oct.

Not common, associated with *Ribes* sp., *Sorbus* sp. and *Rosa* sp. forests. 4690.

(4) *Widely distributed* :

Ampelocissus latifolia (Roxb.) Planch. (Vitaceae) (V. Panibel ; E. Jungle angoor, Jungle grape wine).

Large stemmed climber. Flowers red. Fruits black, globose, 6-9 mm long, succulent. Ripe fruits are edible, sweet-sour in taste.

Fl. & Fr. : Aug.-Dec.

Associated with *Shorea robusta*, *Anogeissus latifolia* forests. 4681.

Berberis asiatica DC. (Berberidaceae) (V. Kashnoi, Kingora ; E. Indian berberry, Tanner's berberry).

Robust deciduous shrub. Flowers yellow. Berry blue-black, 0.8 cm diam., ovoid. The sour tasting fruits are eaten after mixed with salt and mustard.

Fl. & Fr. : Apr.-Nov.

Associated with Oak-Rhododendron forests and wastelands. 4632.

Carissa opaca Stapf (Apocynaceae) (V. Karonda).

Evergreen shrub. Flowers white, often tinged with pink, fragrant. Berry ellipsoid, purplish-black, 0.4-1.8 cm long. Ripe fruits are eaten raw or made into tarts ; unripe fruits are pickled.

Fl. & Fr. : Mar.-June.

On dry slopes. 4425.

Celtis australis L. (Ulmaceae) (V. Kharik ; E. European nettle tree, Hackberry).

Large deciduous tree. Flowers greenish-or pale yellow appearing before or with the leaves. Drupe elliptic or ellipsoid, about 1.2 cm long, purplish-black. Ripe fruits are eaten raw, sweet in taste.

Fl. & Fr. : Mar.-Oct.

Planted near villages and margins of agricultural fields. 4637.

C. eriocarpa Decne. (Ulmaceae) (V. Kharik ; E. European nettle tree).

Small deciduous tree. Flowers greenish or pale yellow. Drupe 0.6 cm long, yellowish densely tomentose when young, ultimately more or less glabrous. Fruits are eaten raw, sweet in taste.

Fl. & Fr. : Mar.-Nov.

Planted in the margins of agricultural field margins. 4448.

Cissus repanda Vahl (Vitaceae) (V. Panlagula, Panibel).

Large deciduous climber. Flowers dull red or cream-coloured. Fruits pyriform, 6.5-12.5 mm long. Ripe fruits are edible, sweet-sour in taste and also made into sauce.

Fl. & Fr. : May-Aug.

Associated with *Pinus* forest. 4682.

Coriaria nepalensis Wall. (Coriariaceae) (V. Gogsa, Gangroo, Masuri, Markauli, Varul ; E. Mussoorie berry).

Large deciduous shrub. Flowers greenish-yellow. Fruits red or dark brown at first, finally blue-black, 3-5 mm in diam., with 5 carpels encircled by 5 larger purple fleshy persistent petals. Ripe fruits are eaten though not very good in taste. If taken in large quantities causes intoxication.

Fl. & Fr. : Feb.-July.

Associated with Oak-Rhododendron forests. 4507.

***Cotoneaster microphyllus** Wall. ex Lindl. (Rosaceae) (V. Gheri).

Procumbent rigid much-branched evergreen shrub. Flowers white. Fruits scarlet when ripe, globose, 6-12 mm in diam. Ripe fruits are astringent, frequently eaten by shepherds.

Fl. & Fr. : Apr.-Nov.

On rocky and alpine slopes. 5470.

Debregeasia longifolia (Burm. f.) Wedd. (Urticaceae) (V. Sigar, Tusarra; E. Wild rhea). Fig. 32.

Evergreen small tree. Berry clusters round, 3-7 mm in diam., orange-yellow. Ripe fruits are eaten raw, sweet in taste.

Fl. & Fr. : Feb.-July.

Nearby ravines and shady forests. 4626.

D. salicifolia (D. Don) Rendle. (Urticaceae) (V. Siaru, Syanru, Tusarra). Fig. 33.

Evergreen shrub. Berry globose, about 6 mm in diam., fleshy, orange-yellow. Ripe fruits are eaten raw, sweet in taste.

Fl. & Fr. : Feb.-July.

In riverine places. 4625.

Duchesnea indica (Andr.) Focke (Rosaceae) (V. Bhuin-kaphal, Kaphalya; E. Indian strawberry).

Softly procumbent, perennial, silky hairy herb. Flowers yellow. Fruits bright red, globose with succulent receptacle, about 0.5-1.5 cm in diam., juicy. Ripe fruits are eaten raw, sweet in taste.

Fl. & Fr. : Feb.-Sept.

In moist and shady places. 4503.

Ficus auriculata Lour. (Moraceae) (V. Timla, Tirboi). Fig. 36.

Small tree. Fruits strongly ribbed, hairy when young but becoming hairless, russet-brown and tinged with red or purple when ripe, 2.5-5.0 × 5.0-7.5 cm. Ripe fruits are eaten raw and also cooked as vegetable.

Figs ripen during May-July.

Planted near the villages and margins of agricultural fields. 4491.

F. palmata Forsk. (Moraceae) (V. Bedu). Fig. 37.

Small tree. Figs axillary, stalked, solitary or in pairs, globose or pear-shaped, 0.8-2.4 cm in diam., narrowed to the base, usually tomentose, purple when ripe. Ripe fruits are eaten raw, sweet in taste, and also taken with curd

with salt and mustard. The boiled fruits mixed with curd and condiments like coriander, cumin, black pepper, salt etc., a preparation locally known as *raita*, a remedy for dysentery.

Figs ripen during June-Oct.

In dry and waste places. 4579.

F. racemosa L. (Moraceae) (V. Gular, Umnari; E. Cluster fig).

Deciduous tree. Fruits globose, pyriform or turbinate, smooth or downy, 2.0-4.5 cm in diam., reddish or orange when ripe. Ripe fruits are eaten raw. Roasted fruits are taken with milk and sugar considered to increase strength. Unripe fruit is pounded, mixed with flour, made into cakes, taken during famine.

Figs ripen during Mar.-July.

In open and shady forests, often planted near villages. 4609.

Fragaria rubicola Lindl. ex Lacaita (Rosaceae) (V. Gandkaphal, Kailashi kaphal, Balo; E. Alpine strawberry, Perpetual strawberry, Wild strawberry).

Softly, perennial, silky hairy herb. Flowers white, fruits red, globose, succulent, about 1.0-1.5 cm in diam., aromatic. Ripe fruits are astringent and diuretic, eaten raw.

Fl. & Fr. : Apr.-July.

On open slopes and in Oak-Rhododendron forests along with mosses. 4409.

Grewia optiva Drummond ex Burret. (Tiliaceae) (V. Bhiyol, Bhema, Biul).

Small tree. Flowers dull yellowish-white. Drupe 1-4-lobed, black when ripe, 0.6-2.2 cm in diam., covered with scattered, stellate hairs, glabrous. Ripe fruits sweet in taste.

Fl. & Fr. : Apr.-Nov.

Frequently planted along edges of agricultural fields. 4678.

Juglans regia L. (Juglandaceae) (V. Akhor; E. Himalayan walnut). Fig. 39.

Tree. Flowers green. Drupe globose or ovoid, 2.5-4.0 cm long, pubescent, green often tinged with pink pericarp, thick, fleshy and enclosing a woody, 2-valved nut, 4-lobed cotyledons in a single seed. Kernels are eaten, an important article of diet, and in some villages pressed for edible oil.

Fl. & Fr. : Feb.-Nov.

Associated with Oak-Rhododendron forests and cultivated. 4857.

Leea crispa L. (Leeaceae) (V. Kawee, Kumata, Kurmali).

Large perennial deciduous undershrub. Flowers white, with yellowish tinge. Berries green, finally black, depressed globose, 6-10 mm in diam., fleshy. Ripe fruits are eaten, sour-sweet in taste.

Fl. & Fr. : June-Dec.

Associated with *Pinus* sp. forest. 4585.

Morus serrata Roxb. (Moraceae) (V. Kimu ; E. Himalayan Mulberry). Fig. 38.

Tree. Flowers greenish. Fruits white or dark purple, 1.5-2.5 cm in long, mucilaginous, fleshy, containing many seeded fruitlets. Ripe fruits are eaten raw, sweet in taste, and also made into sauce.

Fl. & Fr. : Apr.-June.

Associated with Oak-Rhododendron forests. 4451.

Murraya koenigii (L.) Spreng. (Rutaceae) (V. Gandalu ; E. Curry leaf tree). Fig. 11.

Deciduous, strongly scented pubescent shrub. Flowers white. Berry black when ripe, sub-globose, 0.5 cm in diam., rugose. Ripe fruits are edible, aromatic and sweet in taste. Leaves are much used for flavouring curries and other food dishes.

Fl. & Fr. : Jan.-Apr.

In dry places. 4683.

Opuntia elatior Mill (Cactaceae) (V. Pharsulu, Soru ; E. Prickly pear).

Shrub. Flowers yellow. Berry reddish when

ripe, pyriform. Fruits are eaten after thoroughly roasting.

Fl. & Fr. : June-Sept.

On dry and waste places. 4482.

Phoenix acaulis Roxb. ex Buch.-Ham. (Palmae) (V. Khajur, Khajin ; E. Wild date palm).

Dwarf palm. Fruit scaled on the spikelets at a narrow verticle angle, ovoid-oblong, 1.2-1.8 cm long, yellowish to reddish-brown. Ripe fruits are eaten raw, sweet in taste. A sugary sap rich in vitamins is obtained from the trunk and is used as beverage.

Fl. & Fr. : Dec.-May.

In open and dry places. 4463.

***P. humilis** Royle (Palmae) (V. Jhar-Khajur ; E. Dwarf date palm, Hill date palm).

Tall erect palm. Fruits ovoid, 1.2-1.8 cm long, generally mucronate, dull black when ripe. The petiole bases are removed from the young shoots and the tender white soft pith is eaten. Ripe fruits are also eaten raw, sweet in taste.

Fl. & Fr. : Dec.-July.

In open and rocky slopes. 4465.

Physalis minima L. (Solanaceae) (V. Bantipariya, Damphoo ; E. Sun berry, Ground berry).

Erect herb. Flowers yellow. Berry yellow, 1.0-1.8 cm long, completely enclosed within the enlarged membranous, 5-10-ribbed calyx. Ripe fruits are eaten raw, sweet in taste.

Fl. & Fr. : May-Dec.

On open waste and grassy places. 8584.

Prunus armeniaca L. (Rosaceae) (V. Chulee, Khubani ; E. Common apricot).

Tree. Flowers pink or white. Fruits smooth, yellow, eaten raw, sweet-sour in taste. Kernels extracted for fatty oil used for cooking.

Fl. & Fr. : Apr.-Aug.

Cultivated in the margins of agricultural fields. 4670.

Prunus cerasoides D. Don (Rosaceae) (V. Paiya, Padmak ; E. Himalayan wild cherry).

Small tree. Flowers pink, white or crimson, appearing before or with the leaves. Drupe red or yellow, ovoid, 1.2-2 cm in long. Ripe fruits are edible, sour in taste.

Fl. & Fr. : Oct.-May.

Often cultivated. 4717.

P. persica (L.) Batsch. (Rosaceae) (V. Aru, Chirola ; E. Peach tree).

Small deciduous tree. Flowers pink. Drupe succulent, downy, about 3-5 cm long. Ripe fruits are edible and an edible oil extracted from seeds, is used for cooking as well as an illuminant.

Fl. & Fr. : Mar.-July.

Wild as well as cultivated. 4517.

Punica granatum L. (Punicaceae) (V. Anar, Darim, Danvi ; E. Pomegranate).

Deciduous small tree. Flowers orange or scarlet. Berry globose, reddish-brown, 3.5-7.0 cm in diam., thin, with coriaceous, woody epicarp and crowded with the persistent calyx lobes. Fruits (seeds) are edible and are also used in beverages. Seeds mixed with salt, green chillies and *pudina* (*Mentha sylvestris*) are ground to make a sauce. Also used as an acidulous spice in various food preparations.

Fl. & Fr. : Apr.-Dec.

Wild on dry limestone soil, commonly cultivated. 4860.

***Pyracantha crenulata** (D. Don) Roem. (Rosaceae).

Evergreen, glabrous, spiny shrub. Flowers white. Fruits orange-red, globose, about 6 cm in diam. Ripe fruits are eaten raw.

Fl. & Fr. : Apr.-Nov.

In dry places ; common along banks of streams. 4515.

Pyrus pashia Buch.-Ham. ex D. Don (Rosaceae) (V. Melu, Mole, Mol). Fig. 15.

Small deciduous tree. Flowers white.

Fruits yellow-brown ultimately turning black with raised spots, globose, about 2.0-3.5 cm in diam. Ripe fruits are edible.

Fl. & Fr. : Jan.-Dec.

In open places and associated with Oak-Rhododendron forests. 4689.

***Rhus parviflora** Roxb. (Anacardiaceae) (V. Saunla, Tungla).

Evergreen shrub. Flowers yellowish-green. Drupe ovoid, red, brown, 4 cm in diam., glabrous, shining. Ripe fruits are edible, sweet-sour in taste ; locally used to quench thirst.

Fl. & Fr. : May-Nov.

In open dry and waste places. 4563.

***Rosa brunonii** Lindl. (Rosaceae) (V. Kunja, Kuja ; E. Himalayan musk rose).

Large rambling climber. Flowers white. Fruits dark-brown, globose, 10-15 cm long. Young shoots are called '*Dankuli*' and eaten raw ; leaves used as vegetable when young. Ripe fruits are eaten raw, sweet in taste, and also made into pickles.

Fl. & Fr. : Apr.-July.

Near streams or riverine places. 4505.

Rubus biflorus Buch.-Ham ex Sp. (Rosaceae) (V. Hissol, Achnoi ; E. Himalayan yellow raspberry).

Large spreading evergreen shrub. Flowers white. Fruits rounded, yellow or orange, 1.0-1.5 cm in diam. Ripe fruits sweet in taste.

Fl. & Fr. : Apr.-July.

In open and dry places. 4486.

R. ellipticus Smith (Rosaceae) (V. Hissalu, Hissar, Anchu ; E. Himalayan yellow raspberry). Figs. 19 & 20.

Large evergreen shrub. Flowers white. Drupelets yellow, 1.2 cm in diam., glabrous, succulent. Ripe fruits have an agreeable flavour and sweetish taste and are relished with salt ; also made into preserves ; occasionally sold in the market.

Fl. & Fr. : Apr.-June.

In open dry places. 4657.

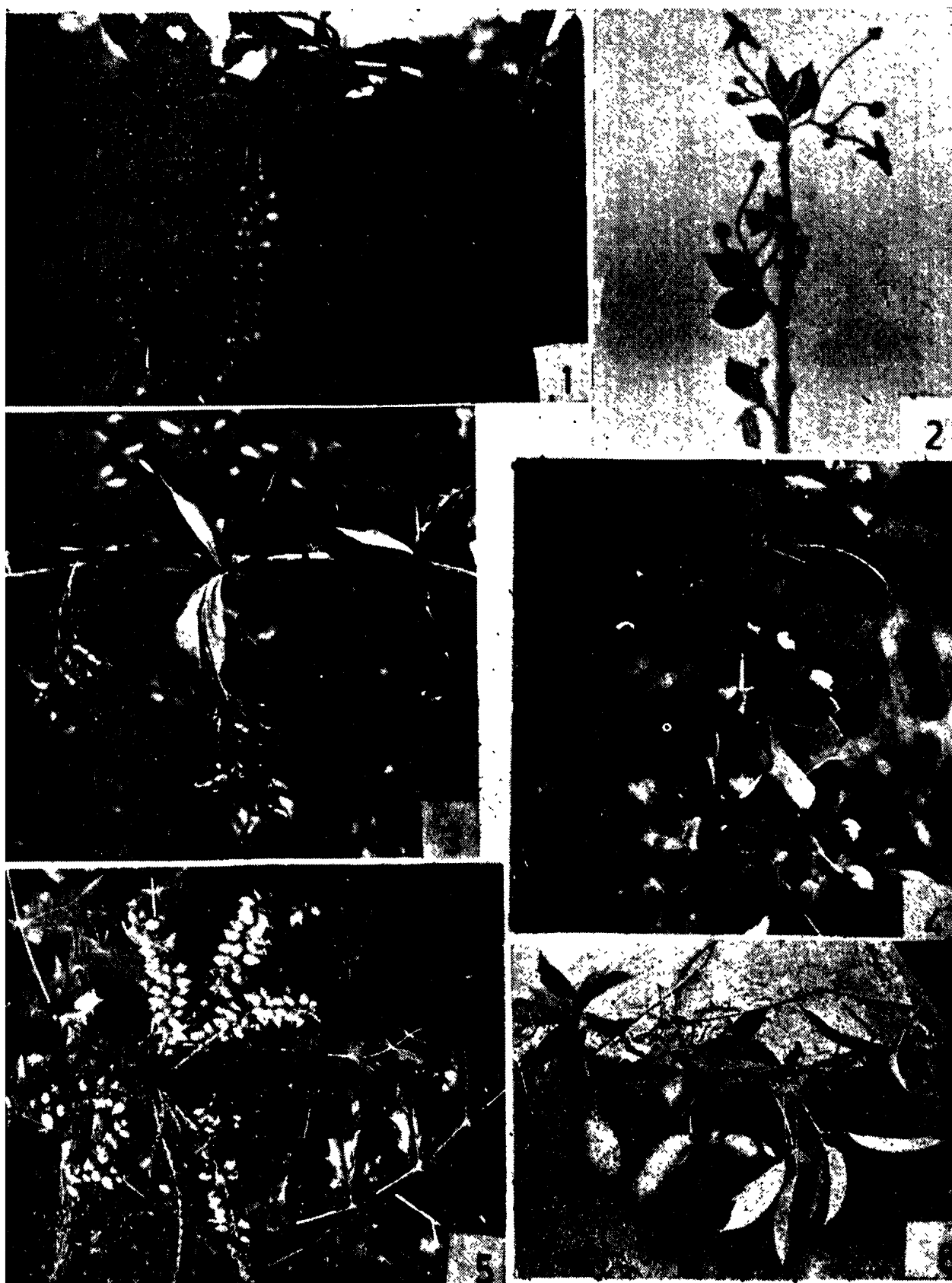


Plate 1. Figs. 1-6 : 1. *Schisandra grandiflora*. 2. *Miliusa velutina*. 3. *Berberis chitria*. 4. *B. lycium*. 5. *Mahonia acanthifolia*. 6. *Holboellia latifolia* var. *latifolia*.

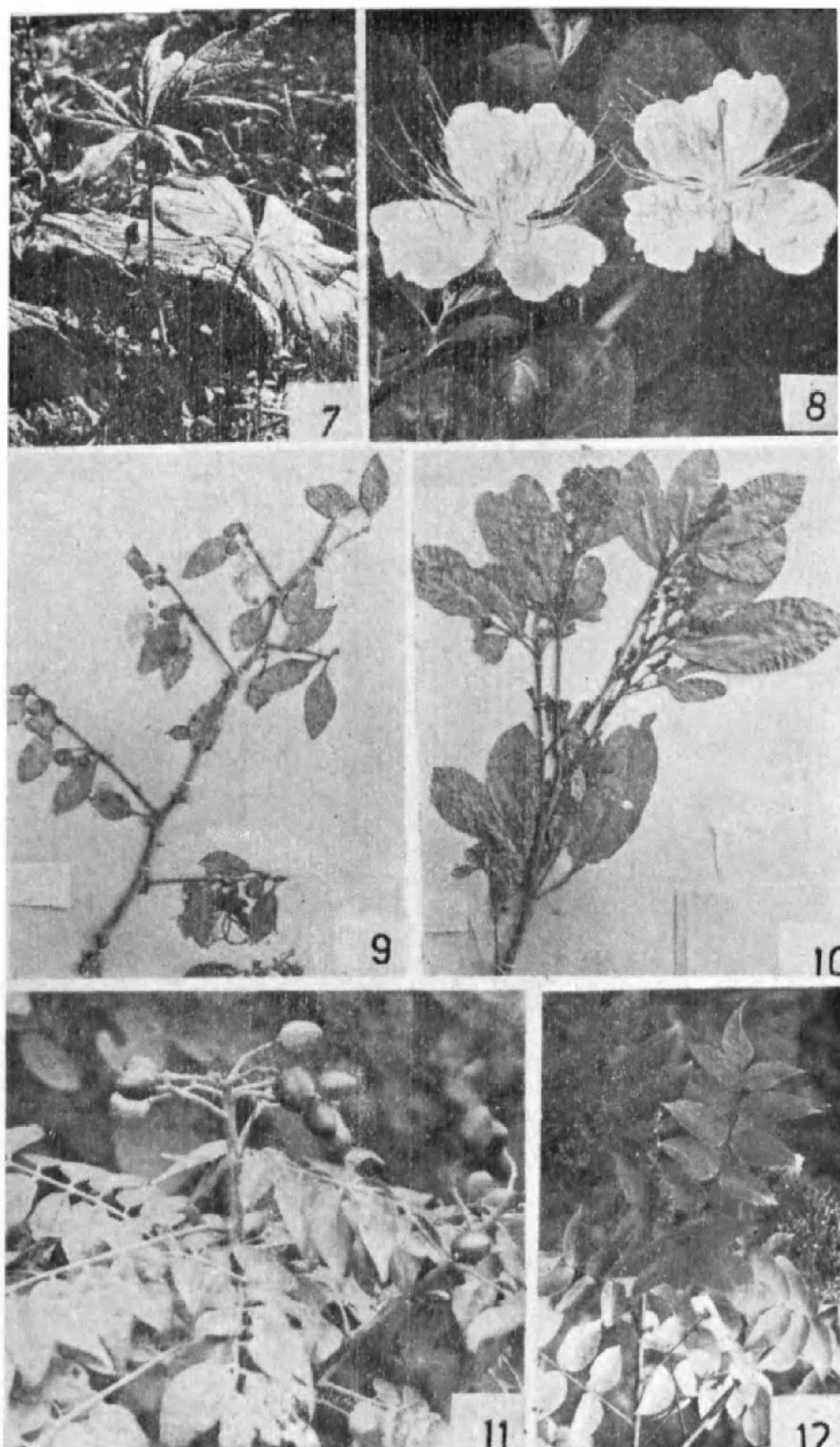
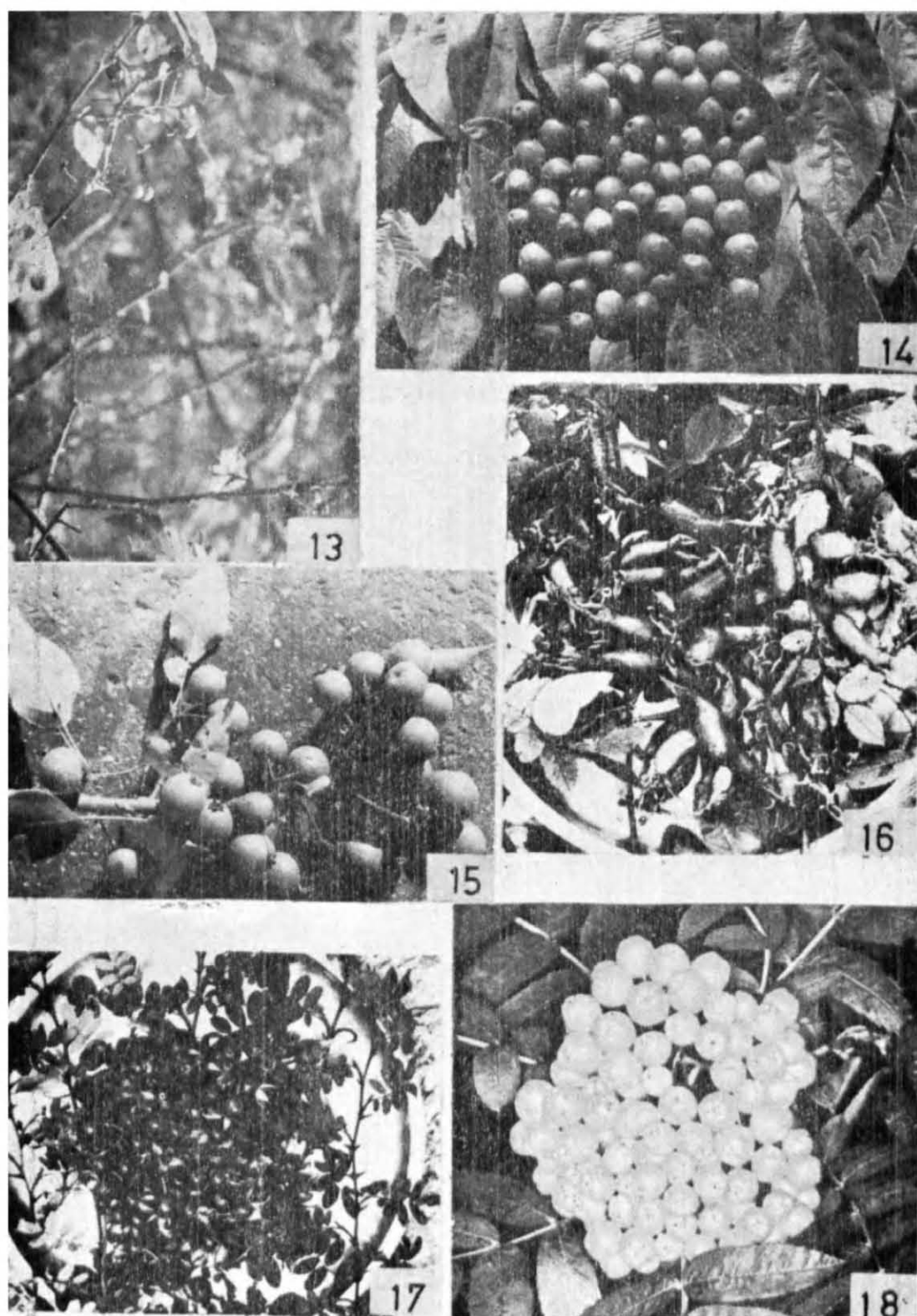


Plate 2. Figs. 7—12 : 7. *Podophyllum hexandrum*. 8. *Capparia spinosa* var. *himalayensis*. 9. *C. zeylanica*. 10. *Glycosmis cochinchinensis*. 11. *Murraya koenigii*. 12. *Rhus semialata*.



. Plate 3. Figs. 13-18 13. *Solanum anguivi*. 14. *Malus baccata* var. *himalaica*.
 15. *Pyrus pashia*. 16. *Rosa macrophylla*. 17. *R. sericea*.
 18. *Sorbus aucuparia*.

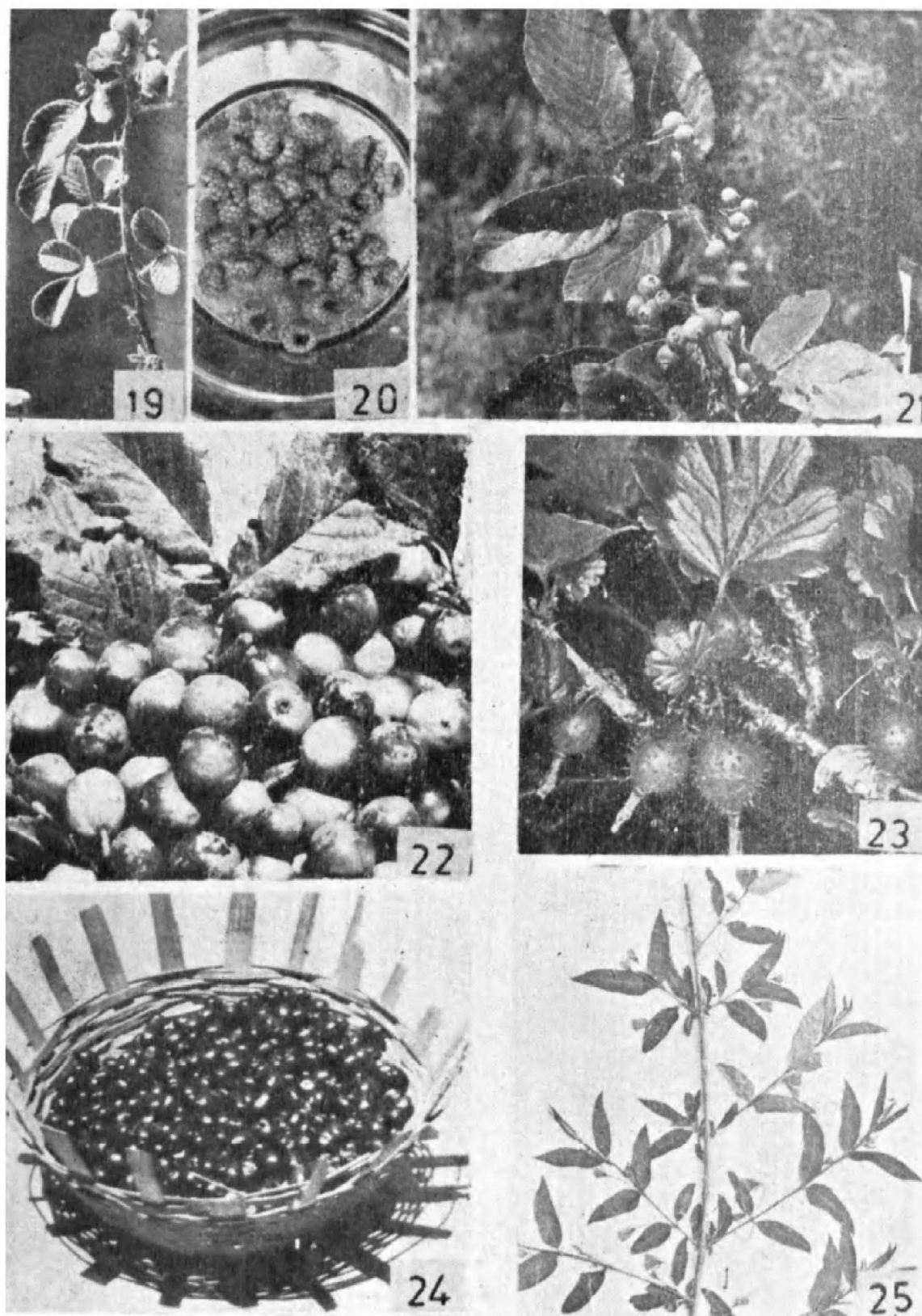


Plate 4. Figs. 19-25 19 & 20. *Rubus ellipticus*. 21. *Sorbus cuspidata*. 22. *Pyrus lanata*.
23. *Ribes alpestre*. 24. *Syzygium cumini*. 25. *Lonicera angustifolia*.

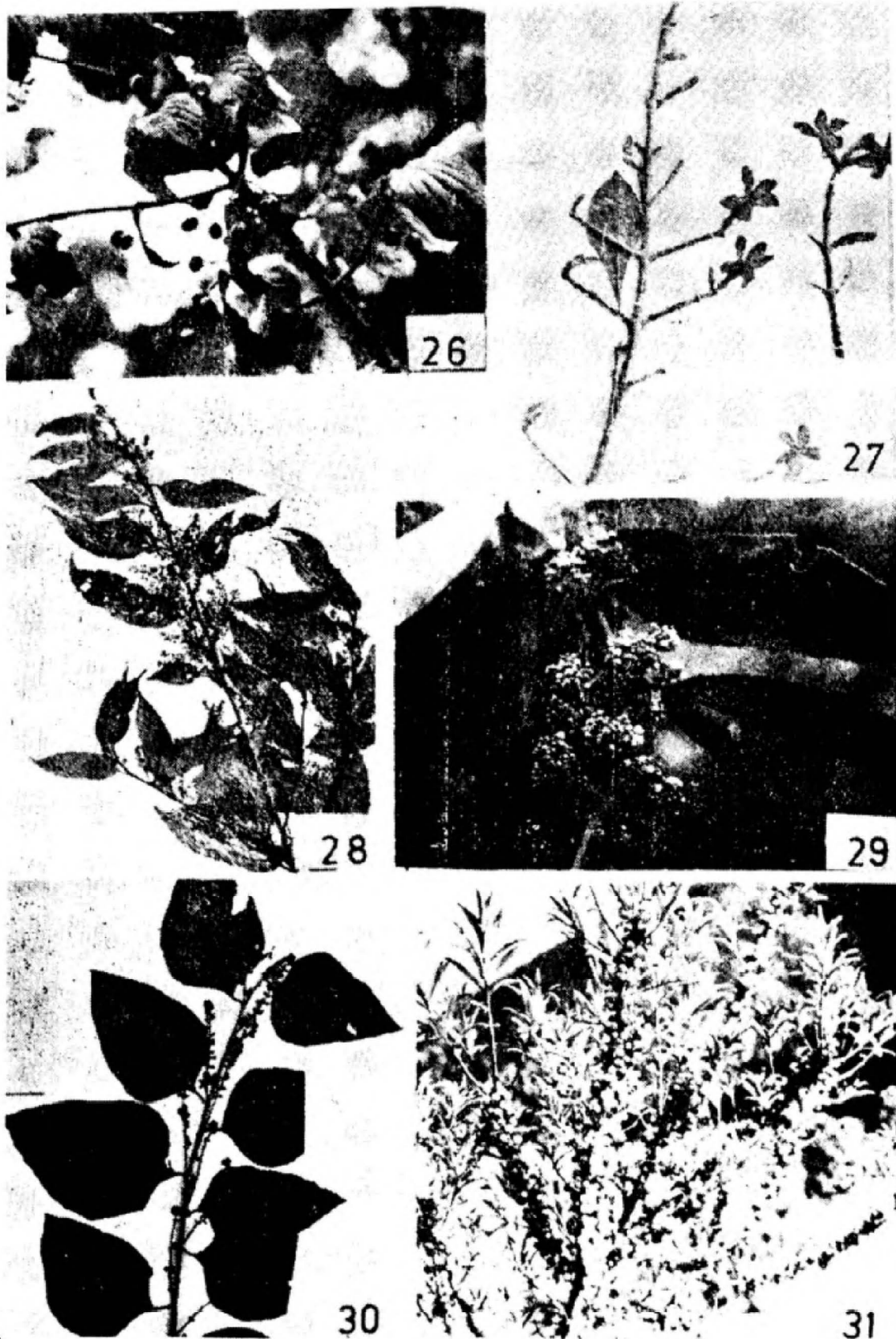


Plate 5. Figs. 26-31 : 26. *Viburnum mullala*. 27. *Gardenia turgida*. 28. *Macra montana*. 29. *Callicarpa macrophylla*. 30. *Bosca amherstiana*. 31. *Hippophae rhamnoides* ssp. *salicifolia*.



Plate 6. Figs. 32-37 : 32. *Debregeesia longifolia*. 33. *D. salicifolia*. 34 & 35. *Artocarpus lacucha*. 36. *Ficus auriculata*. 37. *F. palmata*.

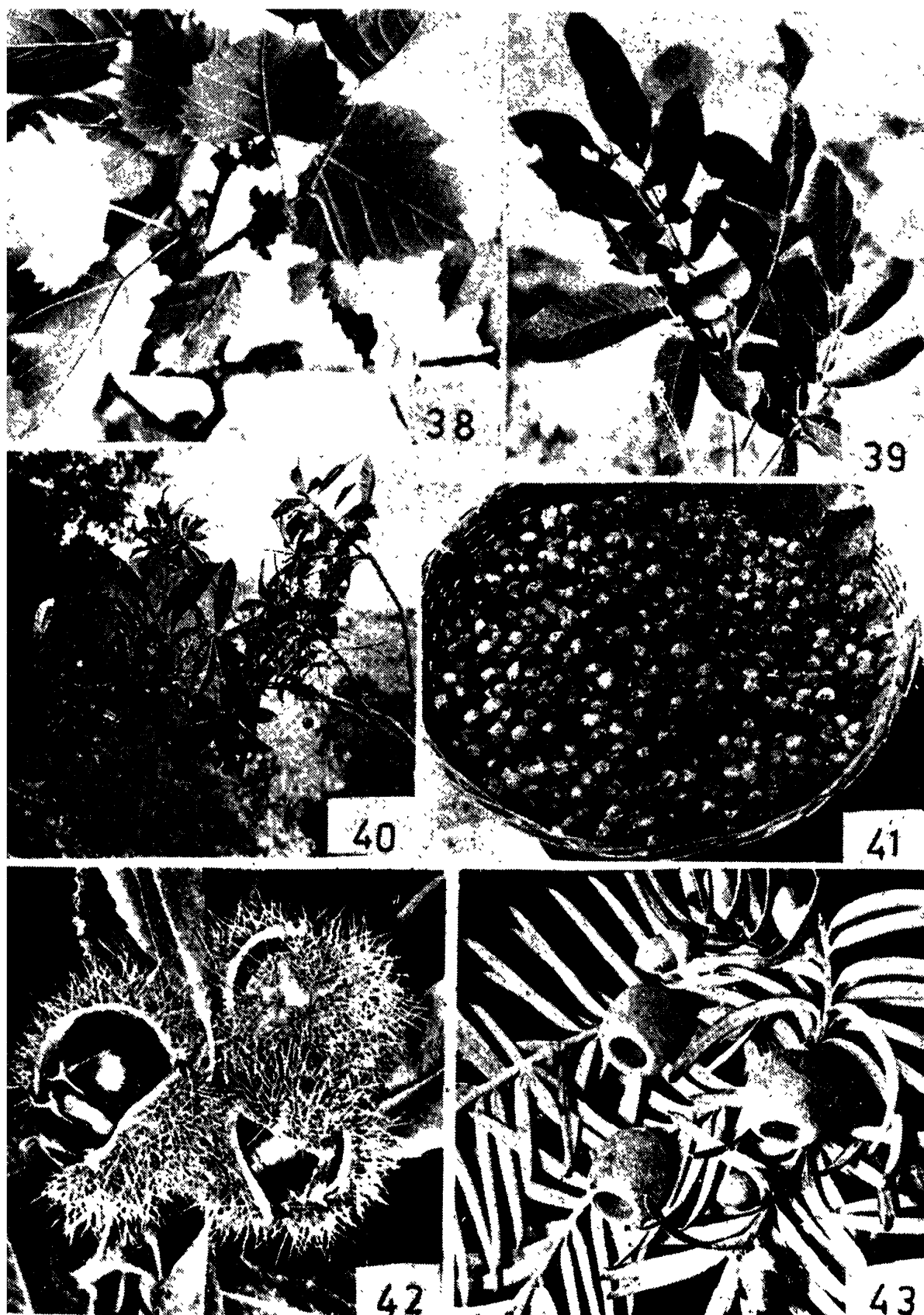


Plate 7. Figs. 38-43 : 38. *Morus serrata*. 39. *Juglans regia*. 40. & 41. *Myrica esculenta*. 42. *Castanopsis tribuloides*. 43. *Taxus baccata* ssp. *wallichiana*.

Solanum nigrum L. (Solanaceae) (V. Makraula; E. Black night shade, Garden night shade).

Erect, much branched herb. Flowers white. Berry green turning to red or black when ripe, sometimes red or yellow, globose, about 0.8 cm in diam., turgid and shining. Ripe fruits are eaten raw, sub-sweet in taste and increase appetite and taste; in large amounts poisonous and intoxicating. Young shoots and leaves are cooked as vegetable.

Fl. & Fr. : Apr.-Oct.

On open waste places. 4584.

Syzygium cumini (L.) Skeels (Myrtaceae) (V. Jamun, Phalenda; E. Black plum, Java plum). Fig. 24.

Large evergreen tree. Flowers greenish-white, fragrant. Berry globose or ovoid, dark purplish black with juicy flesh. Ripe fruits are eaten raw, acrid, sour-sweet in taste or also taken with salt and mustard; fruits sold in the market.

Fl. & Fr. : Mar.-July.

Wild as well cultivated. 4698.

Zizyphus mauritiana Lam. (Rhamnaceae) (V. Ber; E. Chinese date, Indian jujube, Indian plum, Indian cherry).

Small tree. Flowers green. Drupe globose, first yellow, then orange and finally ripening to reddish-brown. Ripe fruits are eaten.

Fl. & Fr. : June-Feb.

In open dry places. 4574.

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