



FODDER TREES OF DISTRICT KATHUA, J&K

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Abstract

Numerous known or unknown plants play an important role in the lives of people and in a way to the economy of a nation. An attempt is made to bring to light some fodder trees of the area. Majority of the Angiospermous trees concerning the study are found in wild state. However, some of the common fodder trees like *Acacia nilotica*, *Acacia catechu*, *Bauhinia variegata*, *Dalbergia sissoo*, *Dendrocalamus strictus*, *Leucaena leucocephala*, *Robinia pseudo-acacia* and *Terminalia bellirica* etc. are also cultivated both by villagers and Govt. agencies like social forestry. The names of species given in the study are complete in all respects and attempt is made to give the valid names along with author citation and also supplemented by English, Hindi and vernacular names. Each plant species is supported by a brief description along with the place of occurrence and present status wherever necessary.

Keywords

Acorn ; fruit of the oak tree.

Berry; a simple throughout succulent fruit and without a stone.

Capsule; a dry dehiscent fruit like ladyfinger.

Chartaceous; having the texture of writing paper; thin and flexible.

Cordate; heart shaped.

Coriaceous; leathery, tough and thick.

Crenate; with rounded teeth.

Culm; the hollow and jointed stem of bamboos.

Drupe; a stone fruit.

Emarginate; with a notch at the apex.

Globose; somewhat spherical.

Mucronate; abruptly terminating in a short, straight, stiff and sharp point.

Ovoid; a solid with an ovate or oval longitudinal section.

Panoo; a Dogri term used for fodder given to goats and sheep.

Pericarp; the portion of fruit formed ovary and whatever adheres to it.

Receptacles; fig fruits.

Scabrid; rough to touch owing to short stiff hairs.

Serrate; toothed like a saw.

Tomentose; covered with hairs which are very short, soft and dense.

Turbinate; top-shaped.

Vern. / vernacular name; local name.

Urceolate; urn-shaped.

Introduction

The area of research is one of the 22 districts of the state of Jammu and Kashmir adjoining Punjab and Himachal Pradesh. Its terrain is diverse consisting of rich agricultural plains along the Punjab border and a mountainous Pahari region in the north along Himachal Pradesh. Kathua district, the gateway of J&K, lies between 320 -17' to 320-55' north latitude and 750-7' to 760-17' east longitude. The district of Kathua is subdivided into five tehsils- three of them Billawar, Basohli and Bani lie in the Shiwalik Himalayas whereas Kathua and Hiranagar lie in the plains besides foothills. The number of villages in the district is approx. 512 and the population of the district is 6.15711 Lacs (as per 2011 census). The mainstay of the population is agriculture and rearing livestock. The area has a rich floral diversity particularly in the Shiwalik hills. Innumerable plants have been used by the people for different benefits even today. The over-exploitation of the valuable resource coupled with habitat destruction has its impact on the rarity and even the extinction of plants.

Tools & Techniques

The tools employed in the study include cutters, plant press, magnifying lens, Photographic camera, field note-book and polythene bags etc. The author has conducted many field trips in randomly selected villages of the research area and interviewed the villagers particularly the livestock holders. The common names of the plants were ascertained by way of investigations. The twigs of the plants or some other specimens were collected, brought back and preserved for further reference. The photographs of the concerned plants were also taken for the purpose of identification and record as well.

Results and Observations

1. ***Grewia optiva*, J.R.Drumm.** (syn. *G.oppositifolia*, Roxb.) ; Vernacular Name- Dhaman; Family- Tiliaceae; Status- common.
A small to medium-sized tree with grey bark. Leaves- simple, 3-5 by 2-3 in., ovate, acuminate, minutely serrate, sometimes obscurely 3-lobed. Flowers- in axillary cymes. Fruit- a globose drupe, 2-4 lobed, dark brown or black when ripe. It is a common fodder tree.
2. ***Grewia serrulata*, DC.** ; Vernacular Name- Dhamani; Family- Tiliaceae; Status- common.
A small tree with dark brown bark. Leaves- simple, alternate, 4-7 by 1.5-2 in., tapering at both ends, acuminate, serrate, petiole .5 in. long, secondary nerves 4-6 pairs, stipules linear and caduceous. Flowers- white, axillary, peduncles 2-3 together, each 2-3 flowered. Sepals about 1 in. long and 3-nerved. Petals about one-fourth the length of sepals and also white. Drupe- .3 in. diam., 1-4 lobed, rugose, black when ripe. The leaves are lopped for fodder.
3. ***Celtis tetrandra*, Roxb.** (Syn. *Celtis australis* L) ; Vern. *Kharak*; Family- Urticaceae; Status- common.
A middle-sized deciduous tree with bluish-grey bark. Leaves- alternate, 3-5 in. long by 1-3 in. broad, obliquely ovate or elliptic, acuminate, coarsely serrate from base, coriaceous and tough, dark green and glabrous above. Flowers- polygamous, greenish-white and minute. Fruit- an ellipsoid drupe about 0.4 in., orange when ripe. Fairly common in *Billawar*, *Basohli* and *Bani*.
4. ***Albizia lebbeck*, Benth.** ; Eng. Lebbeck Tree; Vern. *Siris*; Family- Mimosaceae; Status- Common.
A large deciduous tree with a spreading crown and dark grey bark. Leaves- large, bipinnate; leaflets- 4-9 pairs, oblong, oblique, obtuse and glabrous. Flowers- greenish-white, fragrant. Pod- 8 to 12 in. by 1-1.7 in., flat, thin, firm and straw coloured. It is also a common fodder tree of the area.
5. ***Albizia chinensis*, (Osbeck) Merr.** (Syn. *A.stipulata* Roxb.); Vern. *Sanura*, *Ola*, *Siri*; Family- Mimosaceae.
A large flat-topped, deciduous tree remarkable for its large semi-cordate acute membranous pubescent stipules. Bark is grey with short vertical wrinkles crossed by deeper horizontal furrows. Leaves- bipinnate with 6-16 pairs of pinnae, each with 20-40 pairs of leaflets, 6-10 mm long. Flowers are yellowish-white, slightly tinged with red. Pod- light brown and about 4-6 in. long. Foliage lopped for fodder. Commonly seen at *Macheddi*, *Katli* and *Billawar*.
6. ***Bauhinia variegata*, Linn.** ; Eng. Mountain ebony, Variegated Bauhinia; Hindi *Kachnar*; Vern. *Krael*; Family- Caesalpiniaceae; Status- Common.
A fairly large tree with 4-6 in. long leaves, deeply cordate, cleft about a quarter and lobes obtuse. Flowers- large, fragrant, 4 petals white and 1 purplish-red. Commonly seen in the Shiwalik hills and blooms when leafless. It is a common fodder tree. Flowers and flower buds are also eaten as vegetable by locals.
7. ***Bauhinia vahlii*, Wight and Arn.** ; Eng. Camel's Foot Climber; Vern. *Blungad*; Family- Caesalpiniaceae; Status- Common.
A gigantic evergreen woody climber of forest trees. Leaves- very variable in size, upto 6 in. wide, as broad as long, deeply cordate, dark green and glabrescent above. Flowers- white. Pod- 9 to 12 by 2-3 in. flat, woody and rusty-velvety.
8. ***Acacia nilotica*, L.** ; Eng. Egyptian thorn; Hindi *Babool* ; Vern. *Kikar*; Family- Mimosaceae; Status- Common.
A moderate-sized tree with large spreading crown and dark- brown fissured bark. Spines .5-2 in. long, straight, white, sharply pointed. Leaves- 1 to 2 in. long and bipinnate. Leaflets in 10 to 20 pairs. Flowers- yellow, fragrant and in axillary globose heads. Pod- generally solitary, 4-6 in. by .5 in., deeply indented between the seeds (lomentum). The twigs are lopped for fodder to cattle, sheep, goats and camel.
9. ***Acacia catechu*, Willd.** ; Eng. Catechu, Black Cutch; Vern. *Khair*; Family- Mimosaceae; Status- Common.
A small deciduous tree with deeply cracked brown bark. Spines are curved with long base and always in pairs. Leaves- bipinnate with tiny leaflets in 30-50 pairs. Flowers- tiny in long spikes. Fruit is 2-3 in. long flat pod pointed at the ends.
10. ***Quercus leucotrichophora*, A. Camus** (syn. *Quercus incana* Roxb.) ; Eng. Grey Oak; Vern. *Banj*; Family- Fagaceae; Status- Common.
A medium-sized evergreen tree having dark-grey and rough bark with cracks and fissures. Leaves- simple, 3-6 by 2 in., ovate-lanceolate, acuminate, mucronate-serrate, tough and coriaceous, young leaves pinkish and woolly all over, dark-green and glabrous when mature, white or grey tomentose beneath, petiolate and with narrow base. Acorn is generally solitary. Common in *Bani* and higher reaches of *Billawar*. It is an important multipurpose tree.
11. ***Quercus semecarpifolia*, Smith.** ; Eng. Oak ; Vern. *Khrew*; Family- Fagaceae; Status- Common.
A middle sized or large evergreen tree with dark grey bark, cracked into more or less 4-sided scales. Leaves- 2-5 by 1-3 in., elliptic to oblong, usually with spiny marginal teeth on young trees, but often with entire margins on old trees, dark green and glossy above and rusty tomentose beneath. Acorn is solitary and on previous year's shoots, 1 in. diam., globose, black when ripe. It grows at higher altitudes than *Q. leucotrichophora*. Seen at *Baanjal*, *Padwal* (*Billawar*) and similar higher reaches of *Bani*.
12. ***Quercus dilatata*, Lindl.** ; Eng. Oak ; Vern. *Maru* ; Family- Fagaceae; Status- Common.
A large shade enduring tree, almost evergreen with dark-grey or black bark peeling off in longitudinal scales. Leaves- 1.5-3.5 by .5 -1.7 in., oblong or oblong-lanceolate, acuminate, entire or spinous-serrate, coriaceous, petiole 2-3 in. long, glabrous when mature. Acorn is solitary and on previous year's shoots, .7-1.2 in. long, ovoid or oblong, brown when ripe. It grows at a zone intermediate between that of *Q. leucotrichophora* and *Q. semecarpifolia*. The leaves are lopped for fodder. Seen at higher reaches of *Billawar* and *Bani*.
13. ***Dendrocalamus strictus*, Nees.** ; Eng. Bamboo; Hindi *Baans* Vern. *Chuanthi*; Family- Poaceae, Status- Common.
A densely tufted gregarious bamboo, deciduous in dry climates. Culms are variable in size 20-50 ft. high and 1-3 in. in diameter. Internodes solid or with small cavity. Leaves are variable in size, about 6 in. long, linear-lanceolate, rough, scabrous on the edges and with round base. Gregarious in *Billawar* and *Basohli*.

14. ***Ficus hispida*, Linn.** ; Vern. *Lana*; Family- Moraceae; Status- common.
It is small tree with hollow branches and thin grey or greenish bark, warty on old stems. Leaves- opposite, 4-12 in. long, ovate or obovate-oblong, acute or shortly acuminate, serrate or dentate, coriaceous, scabrid above and tomentose beneath. Fruiting receptacles about 1 in. long and pale-green. Leaves are lopped for fodder to the cattle.
15. ***Ficus racemosa*, L.** (Syn. *Ficus glomerata*) ; Eng. Country Fig, Cluster Fig; Hindi *Goolar* ; Vern. *Rumble*; Family- Moraceae; Status- Common.
A large tree usually seen near streams or ponds. Bark yellowish-grey or rusty with milky latex. Leaves- 4 to 6 in. long, leathery, tapering at both ends. Receptacles arise in large clusters directly from trunk or main branches, red when ripe and about an inch across. The leaves make an excellent fodder.
16. ***Ficus bengalensis*, Linn.** ; Eng. Banyan Tree; Hindi *Bargad*; Vern. *Baro*, *Badoi*; Family-Moraceae; Status- Common.
A large evergreen tree with many prop roots and greyish-white smooth bark exfoliating in irregular flakes. Leaves are simple, petiolate, alternate, 4-8 by 3-5 in., ovate or elliptic, entire, obtuse, subcordate or rounded at the base, thickly coriaceous and glabrescent above. Receptacles are .5 in. across, in axillary pairs, sessile, globose and red when ripe. It is a fairly common tree. The leaves are a good fodder.
17. ***Ficus virens*, Aiton.** (Syn. *F. infectoria*) ; Eng. Java Fig; Hindi *Pilkhan*, *Ram Anjeer*; Vern. *Plakh*; Family- Moraceae. Status- common.
A large deciduous tree with grey bark and milky sap. Leaves- simple, alternate, 4-6 in. long, oval with a broad base and short pointy apex, glabrous, shining above and margin entire. Fruit- .5 in across, in axillary pairs and green but ripening into white. The leaves and branches are lopped for fodder.
18. ***Ficus auriculata*, Lour.** ; Vern. *Trimbal*; Family- Moraceae, Status- Common.
A middle-sized tree with grey warty bark but young shoots are hollow. Leaves are simple, alternate, 5-15 by 4-12 in., broad-ovate or rounded, mucronate, entire or toothed, sub-coriaceous, softly pubescent beneath, petiole 1-10 in. long. Receptacles- turbinate, largest 2 in. long and 3 in. broad, purple-orange when ripe, in clusters of 6-20 on short thick leafless branchlets from the trunk and eaten by locals.
19. ***Ficus religiosa*, Linn.** ; Eng. Peepal Tree; Hindi *Peepal*; Vern. *Bar-Brahma*; Family- Moraceae; Status- Common.
A well known and common tree throughout the region, both in forests and habitations and much planted by the *Hindus*. Also lopped to be fed to cattle and camels.
20. ***Ficus palmata*, Forsk.** ; Eng. Punjab Fig; Hindi *Anjir*; Vern. *Fukada*, *Fagwara*; Family- Moraceae; Status- Common.
A small tree with smooth grey bark and milky latex. Leaves- alternate, 3-5 in. long, orbicular-ovate, acute, toothed or serrate, scabrid above and sometimes deep palmately lobed,. Receptacles- about an in across, solitary and yellow when ripe. Fairly common throughout the region and often lopped as fodder for cattle.
21. ***Ficus semicordata*, Buch.** ; Family- Moraceae; Status- Common.
A small spreading tree with dark-grey bark. Leaves- alternate, 6-8 in. long, oblong-lanceolate, very unequal-sided, acuminate, serrate, glabrous, base semicordate with a rounded lobe on one side. The leaves are a good fodder for cattle.
22. ***Melia azedarach*, Linn.** ; Eng. The Persian Lilac; Vern. *Draink*; Family- Meliaceae; Status- Common.
A moderate-sized tree with smooth dark grey bark. Leaves- bipinnate, 9-18 in. long, pinnae usually opposite, leaflets are ovate-lanceolate, serrate and acuminate. Flowers- lilac-blue, in axillary cyme-bearing panicles. Drupe- about .5 in. across, globose and yellow when ripe.
23. ***Phoenix sylvestris*, Roxb.** ; Eng. Wild Date Palm; Vern. *Khajoor*, *Jangli Khajoor*; Family- Arecaceae; Status- Common.
A widely distributed wild palm with a height of 4-10 m. The large pinnately compound leaves are often lopped for fodder to the cattle.
24. ***Morus alba*, Linn.** ; Eng. Mulberry; Hindi *Shahtoot*; Vern. *Toot*; Family- Moraceae; Status- Common.
A middle-sized deciduous tree with pubescent shoots. Leaves- 2 to 3 in. long, ovate, acute or acuminate, dentate or serrate and sometime lobed. Fruit- 0.3 to 0.5 in. long, white or dark purple. It is a good fodder tree.
25. ***Terminalia bellirica*, Roxb.**; Eng. Belleric Myrobalan; Vern. *Bahera*; Family- Combretaceae; Status- common.
A large deciduous tree with bluish or ash-grey bark. Leaves are large, simple, alternate, crowded towards the ends of branches, 3-8 in. long, ovate-elliptic and coriaceous. Fruit- about 1 in. long, ellipsoidal or globose, grey velvety drupe. The leaves are an excellent fodder to the cattle.
26. ***Bombax ceiba*, L.** ;Eng. Silk-Cotton Tree; Hindi *Semul*; Vern. *Simbal*; Family-Bombacaceae ; Status- Common.
A Large deciduous tree commonly seen in the Shiwaliks. Stem is straight, covered with large conical prickles when young, branches whorled and horizontally spreading. Leaves are digitate compound, leaflets 5-7 and 6-9 by 3-5 in., lanceolate or oblanceolate, acuminate, entire, more or less coriaceous, glabrous and petiolulate. Flowers are large, 4-5 in. across, fleshy and crimson-orange. Fruit is a large capsule enclosing seeds surrounded by silky hairs. Often lopped for fodder to the cattle.
27. ***Erythrina subrosa*, Roxb.** ;Eng. Coral Tree ;Hindi *Pangra*; Vern. *Thubb* ;Family- Papilionaceae.
A medium-sized tree with spiny, corky, deeply fissured bark and spines present on branches. Leaves- compound, leaflets 3, broadly ovate, the terminal largest, 3-5 in., all densely hairy beneath often with reddish-brown hairs. Flower- scarlet red, in short crowded clusters at the ends of branches. Fruit- a hairless pod, cylindric and long pointed. Seen growing wild at *Basohli* and *Katli* (*Billawar*). Leaves and twigs are lopped for fodder to cattle.
28. ***Pistacia chinensis* subsp. *Integerima*, Stew.** ; Eng. East Indian Mastiche; Hindi *Kakra*; Vern. *Kakarsinghi*; Family- Anacardiaceae.
A middle-sized deciduous tree with rough grey and thin bark. Leaves- alternate, imparipinnate, 6-9 in. long, leaflets in 4-6 pairs, subopposite, lanceolate, acuminate, entire and glabrous. Drupe- .3 in. across, oblique, broader than

long, glabrous rugose. The leaves are lopped for fodder to cattle and galls (*kakarsingi*) are used in medicines. Commonly seen in *Billawar*, *Basohli* and *Bani*.

29. ***Flacourtia ramontchii*, L'Herit.** (Syn. *Flacourtia indica*); Eng. Madagascar plum; Vern. *Riu*; Family- Flacourtiaceae; Status-common.
A small thorny deciduous tree with whitish-grey bark. Leaves are 2-4 in. long, ovate, obtusely serrate, glabrous and tomentose beneath. Flowers- small and greenish-yellow. Fruit- globose, red or dark-brown when ripe, eaten by locals. The twigs are lopped for fodder in *Billawar*, *Basohli* and *Bani*.
30. ***Syzygium cumini*, L.** ; Jambolana, Java Plum; Hindi *Jamun*; Vern. *Jumman*; Family- Myrtaceae; Status- common.
The plant species which is a medium-sized tree with small leaves and small fruits which are generally eaten by the birds is locally called *Jumman*. Other species (*Syzygium nervosum*) is a large tree bearing large edible fruits, large leaves and locally called *Dahlen*. The former is occasionally lopped for fodder to cattle in *Dharjankhar* and *Dhar-Mahanpur*.
31. ***Cordia dichotoma*, Forst.** ; Eng. Clammy cherry, Lasora; Vern. *Lasura*; Family- Boraginaceae; Status- Common.
A middle-sized deciduous tree with grey to brown bark. Leaves are simple, large, 3-6 by 2-4 in., broad-ovate, margins wavy, coriaceous and glabrous above. Flowers are white, polygamous and in corymbose cymes. Drupe is yellow and glossy when ripe, usually 1-seeded and filled with viscid pulp. Occurs in wild as well as cultivated for fodder and fruits which are cooked and pickled.
32. ***Casearia tomentosa*, Roxb.** ; Hindi *Chilla*; Vern. *Chilla*; Family- Flacourtiaceae; Status- Common.
A small tree with many downy twigs. Leaves- simple, 3-6 by 1.7-3 in., elliptic-oblong, glabrous, acute apex, rounded base. Flowers- small, greenish-yellow, numerous, fascicled in the axils of leaves. Fruit- about an inch, 3 valved and 6 ribbed, green but yellow when ripe. Fruits are commonly used as fish-poison. The twigs are lopped for fodder to the cattle in *Billawar*, *Basohli* and *Bani*.
33. ***Oroxylum indicum*, Vent.** ; Eng. Shyonak Tree; Vern. *Tantra*; Family- Bignoniaceae; Status- Common.
A small tree with few branches and a small open crown. Leaves- opposite, 3-pinnate near the base, 2-pinnate about the middle and simply pinnate towards the apex, 4-6 ft. long. Capsule 2-valved, 18-30 by 3 in. The tree is lopped for fodder in *Billawar* and *Basohli*.
34. ***Moringa oleifera*, Lamk.** ; Eng. Drum Stick Tree; Vern. *Suhanjana*; Family-Moringaceae; Status- Common.
A medium sized deciduous tree with thick corky bark. Leaves- 1 to 2.5 ft. long, 3-pinnate. Flowers- 1 in. across, strongly honey scented and pinkish-white. Capsule (pod) is 9-20 by .6 in., linear, pendulous, longitudinally ribbed and slightly constricted between the seeds.
35. ***Mallotus philippinensis*, (Lam.) Muell.-Arg.**; Eng. Monkey face Tree, Kumkum; Vern. *Kaamla*; Family- Euphorbiaceae; Status- Common.
A small evergreen tree with thin, dark-grey and somewhat rough bark. Young branches are rusty. Leaves- alternate, simple, petiolate, 3-9 in. long, ovate, ovate-oblong or lanceolate, entire or closely toothed, glabrous above, pubescent and with close-set red glands beneath. Fruit- a 3-lobed capsule, .5 in. across, covered with a crimson powder when ripe. Common throughout the region and also used as fodder for cattle.
36. ***Dalbergia sissoo*, Roxb.** ; Eng. Indian dalbergia, sisu, Indian Rosewood; Hindi *Shisham*; Vern. *Tahli*; Family- Papilionaceae; Status- Common.
A middle-sized deciduous tree present throughout the region. Leaves are unipinnate compound, leaflets 3 or 5, broadly oval, acuminate, glabrous and leathery. Fruit- thin, flat pod, 1.5-3 in. and pale brown. Twigs are lopped for fodder to cattle.
37. ***Aesculus indica*, (Colebr. Ex Cambess.) Hook.** ; Eng. Horse Chestnut; Vern. *Singla*; Family- Hippocastanaceae.
A large deciduous tree to 30 m or more with distinct long-stalked palmate leaves. Leaflets 5-9, elliptic, pointed and sharply toothed. Inflorescence with large terminal narrow pyramidal clusters of white flowers. Fruit- ovoid, 1-2 in., smooth; seeds 1-3, dark-brown and shining. Seen at *Machhedi*, *Bani* and is lopped for fodder.
38. ***Mitragyna parviflora*, Korth.** ; Vern. *Sangla*; Hindi *Kaim*; Family- Rubiaceae.
A large deciduous tree with pale grey or yellowish flaking bark. Leaves in opposite pairs, variable in size and shape, 2- 6 in., obovate, apex shortly pointed. Flowers- tiny, yellowish, clustered in round heads. The leaves are a nutritious fodder.
39. ***Leucaena leucocephala*, (Lam.) de Wit.** ; Eng. White Popinac; Hindi *Subabool*; Vern. *Laseeni*; Family- Mimosaceae; Status- common.
It is an unarmed evergreen, small tree introduced by social forestry. Leaves are pinnately compound. Flowers are white and in globose heads. Since it grows rapidly, therefore, it has become a very popular fodder tree of the region. It is said to promote the flow of milk in milch cows.
40. ***Butea monosperma*, (Lam.) Kuntze.** ; Eng. Flame of the Forest, Dhak; Hindi *Palash*; Vern. *Palah* ; Family- Papilionaceae; Status- Common.
A deciduous tree to 15 m. height. Leaves- trifoliate, leaflets rhomboid, lateral leaflets are smaller, obliquely ovate, terminal leaflet broadly obovate, all silky beneath. Blooms when leafless and thus giving a spectacular look. Flowers- bright red and tinged with orange. It is very common in *Hiranagar* and adjoining areas of *Kathua*. Commonly lopped for fodder in the region.
41. ***Pyrus pashia*, Ham.** ; Eng. Elephant apple; Vern. *Kainth* ; Family- Rosaceae; Status- Common.
A moderate-sized deciduous tree commonly seen throughout Shiwalik hills of area. Leaves- simple, vary in size and shape, generally 2-4 by 1 in., ovate, ovate-lanceolate, acuminate, serrate, glabrous and lobed. Flowers- white, 1 in. across and it blooms when leafless. Fruit- globose, 1 in. across, dark-brown with white spots. Usually fed to sheep and goats but also fed to cattle. (*Billawar*, *Basohli*, *Bani*).

42. ***Prunus persica*, Benth.** ; Eng. Peach; Hindi *Aru*; Vern. *Aran*; Family- Rosaceae; Status- Common.
A small deciduous tree with dark-grey bark. Leaves- simple, 2-5 by 1 in., oblong-lanceolate, serrate and glabrous. Flowers- large, corolla is pinkish and rosaceous, blooms when leafless. Fruit- a drupe. It is found in a semi-wild state throughout the region. The twigs are also used as fodder to the cattle.
43. ***Myrsine semiserrata*, Wall.** ; Vern. *Chiundi* ; Family- Myrsinaceae; Status- Common.
A small evergreen tree with ash coloured bark. Leaves are simple, lanceolate, 2-5 by 1 in., acute, cuspidate-serrate towards apex, coriaceous, gland-dotted, and glabrous. Flowers are small in dense axillary fascicles. Berry is of pea size, globose and reddish-brown. The twigs are occasionally lopped for fodder to the cattle.
44. ***Litsaea glutinosa*, C.B Robinson**; (Syn. *Litsaea chinensis*) ; Hindi *Maida-lakri*; Vern. *Riyan*; Family- Lauraceae.
A moderate-sized tree with grey soft corky bark, young parts grey-tomentose. Leaves- simple, large, 5-10 by 4 in., elliptic-ovate, acute, glabrescent above, grey-tomentose beneath, coriaceous, lateral nerves 8-12 pairs, petiole about 1 in. long. Fruit- about .3 in. across and globose. Commonly seen in the region.
45. ***Litsaea monopetala* Pers.** (Syn. *Litsaea polyantha* Juss.) ; Vern. *Goadh* ; Family- Lauraceae; Status- Common.
A moderate-sized evergreen tree with dark grey smooth bark and large leaves 4-8 in. long, oblong-ovate, apex acute or rounded. It is a common fodder tree in *Billawar* and *Basohli*.
46. ***Litsaea elongata*, Wall.** ; Vern. *Khaddambu* ; Family- Lauraceae.
A moderate-sized evergreen tree with stout branches. Bark is dark-brown and branchlets rusty-tomentose. Leaves- simple, alternate, 4-6 by 1.5-2.5 in., variable, elliptic-lanceolate, acuminate, coriaceous, glabrous, base acute, peninerved, petiole 0.5 in. long. Fruit- 0.5 in. long and oblong. Leaves and twigs are lopped for fodder. Seen at *Dungara (Billawar)*.
47. ***Litsaea umbrosa*, Nees.** ; Vern. *Sharur*; Family- Lauraceae; Status- unknown.
A moderate-sized evergreen tree with a spreading crown and dark-brown bark. Leaves- simple, alternate, 3-6 in. long, oblong-elliptic or oblong-lanceolate, thinly coriaceous, glabrous above, glaucous beneath, usually sub-triplinerved at the base, petiole about 1 in. Umbels in small 4-5 flowered sessile clusters. Fruit- .3 in. diam. , globose or oblong. An oil is extracted from the fruit which is applied on skin for specific ailments. Seen at higher reaches of *Billawar (Malad)*.
48. ***Holoptelea integrifolia*, Planch.** ; Eng. Indian elm; Vern. *chamar, chamar sama* ; Family- Urticaceae.
A large deciduous tree having grey bark with an offensive smell when freshly cut. Leaves- alternate, 3-6 by 2-3 in., elliptic or broad-oblong, acuminate, entire, coriaceous and glabrous. Fruit- an oval or orbicular samara, 1 in. long, generally chartaceous, a cleft at the tip. The leaves which have an unpleasant smell are also lopped for fodder in *Dyalachak, Salan* and *Hiranagar*.
49. ***Aegle marmelos*, Correa.** ; Eng. Bael ; Hindi *Bel* ; Vern. *Bel-patri*; Family- Rutaceae.
A glabrous deciduous tree with grey corky bark and sharp straight axillary spines about 1 in. long. Leaves- alternate, 3-foliolate; leaflets 2-4 by 1-2.5 in., ovate-lanceolate, acuminate and gland dotted. Fruit- about 2-3 in. across hard berry, green but yellow when ripe. The twigs are lopped for cattle fodder.
50. ***Lannea coromandelica*, Merr.** ; Eng. Jhingan Vern. *Kemble* ; Family- Anacardiaceae; Status- Common.
A moderate-sized deciduous tree with thick soft branchlets and grey bark, smooth upto middle age. Leaves- alternate, few at the ends of branches, imparipinnate, 12-18 in. long, turning yellow before falling, leaflets- ovate-acuminate, entire and glabrous. Drupe- .5 in. long and oblong.
51. ***Pittosporum napaulense*, (DC.) Rehrd. & Wilson.** ; Vern. *Puna* ; Family- Pittosporaceae.
A small handsome tree with short trunk and spreading branches, bark is ash in colour, rough with white specks. Leaves- simple, 3-6 in., lanceolate or elliptic-oblong, acute or acuminate, thinly coriaceous, shining above, margins are wavy or obscurely toothed. Flowers- small, yellowish, in short terminal panicles. Capsule is of the size of pea, yellow when ripe. The twigs are lopped for fodder to the cattle in *Billawar* and *Basohli*.
52. ***Sapindus mukorossi*, Gaertn.** ; Eng. Soap nut; Hindi *Reetha*; Vern. *Ritha* ; Family- Sapindaceae.
A handsome tree resembling the Tun (*Toona ciliata*) with grey bark. Leaves- alternate, paripinnate, 12-20 in. long. Fruit- a fleshy globose 1 seeded drupe, about .7 in. across. The saponaceous pericarp is wrinkled and somewhat translucent in the dry fruit. The leaves are given as fodder to cattle in *Billawar, Basohli* and *Bani*.
53. ***Wendlandia puberula*, DC.** ; Vern. *Pansra* ; Family- Rubiaceae; Status- Common.
A small evergreen tree with rough brownish-grey bark, longitudinally cracked and exfoliating in long strips, branchlets, leaves and inflorescence are grey-tomentose. Leaves- simple, 4-9 by 1-3 in., ovate-lanceolate or narrow-oblong, often densely pubescent beneath. Flowers are small, white and fragrant in much branched terminal and axillary clusters.
54. ***Cassia fistula*, Linn.** ; Eng. Indian Laburnum, Golden Shower; Hindi *Amaltas*; Vern. *Krongal* Family- Caesalpiniaceae ; Status- Common.
A moderate-sized deciduous tree with greenish-grey bark. Leaves- paripinnate, 1-2 ft. long, leaflets in 4-8 pairs, ovate or ovate-oblong, acuminate and entire. Flowers are bright-yellow and blooms when leafless. Pod- upto 2 ft. long and 1 in. across, cylindrical, smooth, indehiscent and dark brown when fully ripe. The twigs are lopped for fodder.
55. ***Diospyros cordifolia*, Roxb.** ; Eng. Mountain persimmon, Bombay ebony; Hindi *Bistendu*; Family- Ebenaceae.
A small deciduous tree with branching spines developing at the ends of twigs on old trees. Leaves are simple, 2-4 by 1.5 in., oblong, tapers gradually to acute apex, minutely velvety and cordate base. Flowers- dioecious, corolla of 4 petals, urceolate, creamy white. Fruits- globose, about 1 in. across, yellow when ripe, calyx green and persistent. Seeds- compressed and inside the bitter pulp. The twigs are lopped for fodder.

56. **Juglans regia**, Linn. ; Eng. Walnut; Hindi *Akhrot* ; Vern. *Khoad*; Family- Juglandaceae.
A large aromatic deciduous tree with velvety shoots and grey bark which is longitudinally fissured. Leaves are imparipinnate, 6-15 in. long, tomentose when young, leaflets are large, elliptic-oblong and entire. Leaves are a good fodder.
57. **Populus deltoids**, Barr. Ex Marsh. ; Eng. Eastern Cottonwood, Carolina Poplar; Vern. *pahari-safeda*; Family- Salicaceae.
A medium-sized deciduous tree having grey bark with vertical fissures. Leaves are large, petiolate, simple, 3-7 by 3-4 in., broad-ovate, acuminate and deltoid. Flowers are borne before the leaves in lateral catkins. The leaves are valued for fodder to goats and sheep in *Billawar* and *Basohli*.
58. **Salix alba**, L. ; Vern. *Badhaa* ; Family- Salicaceae.
A small tree with greenish-grey bark. Leaves- simple, 2-4 by 1 in., oblong or ovate-lanceolate, acuminate, entire or obscurely serrate, silvery tomentose on both surfaces when young, nearly glabrous when mature or persistently silky on both surfaces. Flowers before or sometimes with the leaves. Flowers- unisexual in separate male and female catkins. The twigs are lopped for fodder to the cattle in hills.
59. **Robinia pseudo-acacia**, L. ; Vern. *Pahari-kikar* ; Family- Papilionaceae.
A small deciduous tree with deep longitudinally fissured bark. Leaves are pinnate, leaflets 7-21, ovate, entire, 1-2 in. long. Spines are present on branches. Flowers are white, sweet-scented and in pendulous clusters. Pod- 2 to 4 in. long, flat, brown and hairless. (*Machhedhi*)
60. **Ulmus villosa**, Brandis ; Eng. Elm; Hindi *Upkar*; Vern. *Maraal*; Family- Ulmaceae.
It is a medium-sized tree. Leaves- simple, elliptic-oblong, toothed and with prominent veins. Flowers are tiny and greenish yellow. Seen commonly in Baanjal, Padwal and similar higher reaches of *Billawar* and *Bani*.
61. **Alnus nitida**, Endl. ; Eng. Alder Tree; Vern. *Prak* ; Family- Betulaceae. Status common.
A large tree with dark brown and deeply furrowed bark. Leaves- simple, alternate, 4-5 by 2- 3.5 in., elliptic-ovate, acuminate and crenate. Fruit spike about an inch by .5, ovoid, solitary and erect. Seen commonly in ravines or banks of streams in *Billawar*, *Basohli* and *Bani*. Leaves are used as panoo* for goats and sheep.
62. **Craetiva adansonii**, DC. ; (Syn. *Craetiva nurvala*, *C. religiosa*); Eng. Bengal Quince, Sacred barna, garlic pear; Hindi *Barna*; Vern. *Barna*; Family- Capparidaceae.
A small to medium-sized tree with pale brown bark. Leaves are compound with only three leaflets, glabrous and acuminate. Fruit- spherical berry, 1.5 in. across, green but red when ripe with pale spots. Leaves are lopped for fodder.
63. **Helicteres isora**, Linn. ; Eng. East Indian Screw tree; Vern. *Marorephali*; Family- Sterculiaceae.
A small-sized tree with grey bark. Leaves- simple, 3-6 by 2-4 in., ovate with shallow lobes, short acuminate, scabrous above. Flowers- scarlet red, 1-2 in. across, axillary, 2 or 4 together. Fruit is 1-2 in. long, cylindrical and spirally twisted. (*Kathua*)
64. **Zizyphus mauritiana**, Lamk. var. **fruticosa** (syn. *Z. jujuba*) ; Eng. Indian jujube, Desert apple; Vern. *Ber*, *Jungli Ber*; Family- Rhamnaceae; Status- Common.
A much branched thorny shrub or small deciduous tree. Leaves- about 1 in. long, ovate or sub-orbicular, entire, rounded at ends, dark green, glabrous and often shining above, pale and wooly-hairy beneath. Flowers- about 3 mm across, greenish-yellow and in axillary clusters. Drupe- .5 in. long, globose, yellow and becomes orange-red. Common in drier parts of the region and used as fodder to sheep, goats and even camel.
65. **Zizyphus nummularia**, W. et A., Prodr. ; Vern. *Fuadi*; Family- Rhamnaceae; Status- Common.
A thorny shrub with flexuous branches. Young shoots, underside of leaves and inflorescence grey-pubescent, spines slender and pilose when young, unequal, one slender, other shorter, hooked, bent downwards. Leaves- elliptic or orbicular, .3 to 1 in. long. Fruit- .3 in. across, globose, edible, stone rugose and bony.
66. **Terminalia chebula**, Retz. ; Eng. Chebulic Myrobalan; Hindi *Harara*; Vern. *Rheed*, *Harad*; Family- Combretaceae; Status common.
A medium sized deciduous tree. Leaves- simple, sub-opposite, large, 3-6 in. long, oblong-ovate, leathery, white and wooly when young, shortly acuminate and rounded base. Flowers- short, creamy white in 10 cm. long spikes, petals absent. Fruit- 1 to 2 in., obovoid, ellipsoidal and ribbed drupe. Leaves are an excellent fodder.
67. **Carissa congesta**, Wight. ; Eng. Bengal currant, Christ's thorn; Vern. *Garna* ; Family- Apocynaceae; Status- Common.
It is a small thorny evergreen tree or shrub commonly seen in the Shiwaliks. Leaves- opposite, 1-1.5 by .7-1 in., ovate, acute, dark green and shining above. Flowers- white, dark purple, juicy when ripe and eaten by men. The leaves are greedily eaten by sheep and goats.
68. **Ehertia laevis**, ; Hindi Chamrod; Vern. Chamrod; Family- Boraginaceae.
A medium-sized tree with grey smooth bark. Leaves- simple, alternate, 3-7 by 3-4 in. long, elliptic or obovate, entire, acute or shortly acuminate, glabrous and leathery when mature. Flowers- small, white, star like. Fruit- small orange or red spherical drupe.
69. **Gymnosporia royleana**, Wall. ; Vern. *Gernaith* ; Family- Celastraceae.
A thorny tree or shrub about 8-10 ft. high with grey and thin bark. Spines .5-2 in., axillary, straight and slender. Leaves- .5-2 in. long, ovate or obovate, serrate and coriaceous. Commonly seen in the region and lopped for fodder to the sheep and goats.
70. **Kydia calycina**, Roxb. ; Vern. *Banfukada*; Family- Malvaceae; Status- common.
A moderate-sized deciduous tree with grey bark exfoliating in long strips and rough with large white specks on branches. Leaves- simple, 4-6 in. diam. rounded, cordate, palmately 5-7 nerved and with as many lobes or angles, petiole about half the length of blade. Flowers- white, dioecious, in axillary or terminal panicles. Capsule- subglobose, 3-valved enclosing furrowed reniform seeds.

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