



FLORISTIC DIVERSITY, DISTRIBUTION AND ETHNO-TAXONOMICAL STUDIES ON ARBOREAL MEMBERS OF FAMILY ROSACEAE IN DISTRICT POONCH (J. & K.), INDIA

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Abstract: Poonch district of Jammu and Kashmir have diverse climatic zones ranging from sub-tropical to temperate climate and rich in biodiversity. The objective of this research was to explore the distribution, taxonomical as well as ethnobotanical significance of different arboreal members of the family Rosaceae of this region. The distribution of this woody angiospermic floral group was found with an altitude range between 900 and 3500 m above sea level. The plant habit of this group varied from the shrub e.g., *Cotoneaster microphyllus* (0.5 to 1 m tall) up-to the tall tree e.g., *Prunus domestica* (12 m tall). Authors collected a sum of twelve (12) genera with twenty six (26) species consisting 13 shrubs and 13 tree species. Furthermore, out of 26 species, only *Cotoneaster microphyllus*, *Eriobotrya japonica* and *Rubus ellipticus* were evergreen, while the rest all deciduous with an account of 9 species as native and 17 species as exotic.

Keywords: Arboreal, Diversity, Ethnobotanical, Evergreen, Floristic, Rosaceae.

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INTRODUCTION

India is having the rich source of floristic diversity which treasures the wide range of medicinal plants and herbs that is why it is known as 'Botanical Garden of the World'. The dense forests of India is the principal source of a large number of flora and aromatic plants of medicinal importance. These are largely

collected as raw materials for manufacturing the drugs and perfumery products (Maheshwari, 2000; Acharya and Shrivastava, 2008). Amongst the different states of India, Jammu and Kashmir (J.&K.) is a prominently Himalayan state in the north-western part of India, well known for its bountiful and blissful nature, pleasant climate, beautiful looking people, varied ethnic tribes,



and above all its widespread flora and foliage diversity. The divisions of Jammu and Kashmir vary in their geographic, climatic, vegetative, demographic and cultural characteristics. The floristic diversity of the state is known for the high range of diverse span, extending from the subtropical and sub-temperate flora in Jammu region, ascending to temperate and alpine floristic species in Kashmir valley (Trak *et al.*, 2013).

Angiosperm is the largest and most diverse group of flowering plants within the plant kingdom. Among 4,000,000 plant species which are being identified so far, 2, 86,000 species belong to the angiosperms. Rosaceae is the prominent family that consists of 3,000 species having worldwide distribution. The family is noted for its wide variety of edible fruits including apples, pears, peaches, plums, cherries, almonds, strawberries, raspberries, and more. The rose, arguably the world's most popular flower, is a phenomenon in gardens and for the cut-flower trade, with hundreds of named cultivars. Many other ornamentals for gardens include a large array of shrubs and flowering trees. Attar of roses, also called essence of rose, is a fragrant essential oil distilled from fresh petals of *Rosa* species.

About 70 to 80% population of the Himalayan range depends on traditional medicines (Pie and Manandhar, 1987). Ethno-medico-ecological survey helps us to search, develop new cures for various ailments and helps to protect biodiversity. During the last few decades Ethno-botanical studies have received immense attention to bring back the traditional knowledge on plants from tribal communities who live in remote villages and have intimate relation with the plants around them (Prakash, 1998; Sharma and Pareek, 2021; Rao, 2021).

Within Jammu and Kashmir, Jammu division is having the rich floristic diversity after Kashmir. Numerous taxonomic and ethnobotanical explorations to deal with the floristic diversity of this province have been conducted so far (Singh and Kirn, 1981). Sharma and Kachroo (1981-82) published the Flora of Jammu and plants of Neighbourhood providing taxonomic details in

volume 1 and illustrations in volume 2. Kapur and Sarin (1990) dealt with Flora of Trikuta Hills, presented a great floristic exposition of the plants embracing these hills and the adjoining of Shri Vaishno Devi Shrine. Swami and Gupta (1998) communicated Flora of Udhampur district, which is a valuable interpretation on the higher plants of this particular zone. Bhellum and Magotra (2012) documented the flowering plants of Ramban, Kishtwar and Doda districts, tackling with floristic wealth of these 3 contiguous administrative units in the Chenab Valley, while Malik *et al.* (2015) presented with floristic diversity of Warwan valley. Khuroo *et al.* (2007) described the use of 24 angiosperm plant species by the Gujjars of Kashmir Himalaya as ethno-veterinary medicines. Inventory of 301 species of vascular plants, belonging to 204 genera spreading over 79 families from the Langate Forest Division in Kashmir Himalaya was made by Lone and Pandit (2008). Among these, dicotyledons are signified by 248 species dispensed around 162 genera and 59 families and monocotyledons with 36 species scattered in 27 genera and 12 families.

The district Poonch of Jammu and Kashmir UT, India is located at 33° 25' to 34° 01' North latitude and 73° 58' to 74° 35' East longitude. It has an average elevation of 1070 m sea level. The district is floristically at the very least investigated region in Jammu and Kashmir U.T., with inadequate, infrequent, inconsequential and isolated documentation obtainable on their flora (Singh and Kirn, 1981; Singh, 1992). Mughal *et al.* (2022) while studying the taxonomy, distribution and ethnobotany of arboreal members of the family Anacardiaceae in Poonch district of Jammu and Kashmir, indicated about a rich biodiversity of various angiospermic families in this region. Dar *et al.* (2014) enumerated 352 vascular plants collected during the last 2 decades from Poonch and Rajouri districts of Jammu and Kashmir. Mughal *et al.* (2017) enlisted woody flora of the Poonch district comprising 341 species, belonging to 180 genera in 78 families with 190 species as native and 151 exotic in different growth forms such as trees, shrubs, sub-shrubs, and woody climbers are represented by 152, 140, 15, and 34 species, respectively. Mughal and

Kachhawa (2015) conducted a survey of 9 most popular sacred groves of Poonch district during which woody flora belonging to 24 families was observed with dominance of the family Rosaceae.

So, by taking the above facts under consideration, the current exploration was done in order to find out the floristic diversity, distribution and ethno-taxonomical significance of the arboreal members of family Rosaceae in this region.

MATERIALS AND METHODS

The research was performed in district Poonch of the Pir Panchal range by employing standard methods used in taxonomic field studies (Tomovic *et al.*, 2001). The methods used include:

Exploration: Elaborate and extensive plant collection trips were conducted to the study area from 2012 to 2018. Floristic visits to the whole area were carried out on weekly basis, in different seasons.

Collection: All the basic principles and standard taxonomic procedures (Lawrence, 1951) were followed while collecting the plant specimens.

Procedure for pressing and drying: Processing of plant specimens was carried out using the standard taxonomic procedures (Lawrence, 1951).

Processing, storage and preservation: Standard herbarium techniques (Bridson and Leonard, 1992) were used to store and preserve the pressed and dried specimens.

Description: The circumscription of the plant species under the families was done as per Bentham and Hooker's System (1862-1883).

Identification: The identification of a plant specimen was carried out by using the relevant available floristic literature, chiefly: An annotated Catalogue of the Vascular Plants of West Pakistan and Kashmir (Stewart, 1972), Flora of British India (Hooker, 1872-1897), Flora of Pakistan (Ali and Qaiser, 1995-2009).

RESULTS AND DISCUSSION

The results obtained about arboreal floristic diversity of family Rosaceae are given in the tables 1 and 2. The taxo-ethnobotanical features

of species studied are described as under:

1. *ARMENIACA* Mill.

Armeniaca vulgaris Lamarck, Encycl. 1: 2. 1783. Small deciduous tree, growing 5-8 m tall. Bark greyish brown. Leaves dark green, roundish, apex acute to shortly acuminate, both surfaces glabrous; petiole glabrous. Flowers opening before leaves, white, pink or tinged with red. Fruit a drupe, yellow to orange, often tinged with red on the side exposed to sun.

Flowering period: March-April.

Distribution: Probably originated in Central Asia; found in China, Kazakhstan, Kyrgyzstan, and Uzbekistan. Grows at 700-3000 m in sparse forests on mountain slopes and gullies.

Specimen examined: Banwat, tehsil Haveli, 30.05.2015, RM 056, Plate 01.

Local/Common name: Hari in Pahari, Wild apricot.

Uses: The fruit is rich in carotene and vitamin C; provides a valuable source of food, being eaten fresh or as jams, dried or cooked in meat dishes. The kernels that taste bitter are ground and used in flavouring a local dish called as Curry. Destruction of natural habitat of the wild apricot and its over-exploitation as fuel wood has been causing a steady decline in its populations. Poisonous parts are the wilted leaves, twigs, stems and seeds; cyanogenic glycoside, amygdalin. Liquid from the seed kernels is highly toxic; oil from the seed kernels used as a laxative. Antiseptic, anti-inflammatory, laxative. The fresh ground kernels mixed with water to form a milky paste and applied to dry and cracked nostrils and lips. Salted fruit used in the treatment of cough, asthma, sore throat, diarrhea and ascariasis. Medicinally used for cough and constipation. Warm oil applied on joints to get relief from rheumatic pain (Quattrocchi, 2012).

2. *COTONEASTER* Linn.

Cotoneaster microphyllus Wallich ex Lindley, Bot. Reg. 13: t. 1114. 1827.

Small, prostrate, mat-forming, evergreen shrub, with rigid and much-branched stems. Bark almost dark grey to black. Leaves alternate,

simple, small, 6-13 mm, dark green, leathery, ovate-obovate or elliptic, acute, obtuse or retuse, coriaceous, glossy above and pubescent or pilose beneath, minutely petioled, margin recurved more or less ciliate when young. Flowers small, about 8 mm across, white, solitary, axillary. Sepals densely hairy. Fruit globose or obovoid, finely pubescent, scarlet when ripe.

Flowering period: May-June.

Distribution: Native of Himalaya, distributed from Afghanistan to southwest China, at an altitudinal range of 2000-5400 m.

Specimen examined: Doogran, Poshiana, tehsil Surankote, 05.06.2015, RM 155, Plate 02.

Local/Common name: Loohan in Pahari, Little-leaf cotoneaster.

Uses: Fruits eaten as astringent, used for irregular menstruation. Stolons as astringent. Ceremonial, *dhoop* (Quattrocchi, 2012). The branches are used in Kashmir for making baskets.

3. *CYDONIA* Miller.

Cydonia oblonga Miller, Gard. Dict. ed. 8. Cydonia. No 1. 1768.

Multi-stemmed, deciduous tree or a large shrub, growing up to a height of 5-8 m. Branchlets purplish-red when young, purplish-brown when old, terete, initially densely tomentose, glabrous when old, sparsely lenticellate. Leaves alternate, simple, 6-11 cm long, margin entire, densely pubescent with fine white hairs, leaf blade ovate to oblong; stipules caducous; petiole 0.8-1.5 cm, tomentose. Flowers white or pale pink, 5 cm across. Hypanthium campanulate. Sepals ovate or broadly lanceolate, 5-6 mm, larger than the hypanthium. Petals 5, white or pinkish. Fruit pear-shaped pome, 7-12 cm long, densely tomentose, fragrant, yellow.

Flowering period: April-May.

Distribution: Native of warm temperate S.W. Asia in the Caucasus region; commonly cultivated in Kashmir, Himachal Pradesh and Nilgiris in India.
Specimen examined: Gursai, Ari, tehsil

Mendhar, 27.07.2015, RM 213, Plate 03.

Local/Common name: Bihi in Pahari, Quince.

Uses: Fruit pulp and seeds are soothing and demulcent, useful in irritable bowel syndrome, diarrhea, dysentery, constipation, and in irritable conditions of the mucous membrane. Leaf, bud and bark are astringent, Fruit expectorant, Mucilage used externally for scalds, ulcers and burns. The seed kernel contains the glycoside amygdalin, tannin, mucilage (about 22%), ash (1.3%) and fatty oil (14-19%). In Greece, a tea prepared by boiling dry seeds in water is given in cystitis. The major water-soluble polysaccharide in the mucilage of seeds contains a high proportion of glucuronic acid residues. The fruit contains pectin (yield 0.53% fresh weight) and is similar to that of apple. Ionone glycosides, along with octadienoic acid and its diol, have been isolated from the fruit. Fruit juice contains thiamine, riboflavin, nicotinic acid, vitamin B6, inositol, pantothenic acid, folic acid and biotin. The essential oil also gave a number of ionone-related compounds. The buds contain a cyanogenetic glycoside. The bark and shoots yield hydrocyanic acid on distillation (Khare, 2008). Fruits are eaten; also used in making of jams, jellies and puddings. Also cultivated for use as a root stock for pear.

4. *ERIOBOTRYA* Lindl.

Eriobotrya japonica Lindl., Trans. Linn. Soc. London. Bot. 13: 102. 1822.

Large, evergreen shrub or small tree, attaining a height of 6-8 m. Bark grey, shallowly fissured, on young branches pale-brown and hairy. Branchlets yellowish-brown, densely rusty or greyish-tomentose. Leaves alternate, simple, stiff, coriaceous, 15-25 cm long, elliptic, lanceolate to obovate, dark green above, rusty tomentose beneath, margin entire basally, remotely serrate apically, apex acute or acuminate; petiole nearly absent or short. Stipules subulate, 1-1.5 cm long, pubescent. Flowers in terminal panicles, fragrant, bisexual, 2 cm across, dull white. Sepals 5, imbricate, small with acute teeth. Petals 5, oblong, ovate-clawed, white, delicate in texture. Stamens 20. Ovary rusty-pubescent, apically 5-loculed, with 2 ovules in each locule; styles 5, free. Fruit a 2.5-8 cm long pome, pyriform or

globose, yellow or orange when ripe, seeds 4-10, brownish, oblong, 1-2 cm long.

Flowering period: June.

Distribution: Native of south-central China; cultivated in temperate and sub-tropical regions in E. Asia-China, Japan.

Specimen examined: Poonch Town, tehsil Haveli, 28.05.2015, RM 099, Plate 04..

Local/Common name: Loquat, Japanese plum or Chinese plum.

Uses: The loquat fruits are eaten fresh or mixed with other fruits in fruit salads or fruit cups. Also used in making jams, jellies and chutneys. Wood is hard and close-grained, used in making rulers etc. The generic name is derived from two Greek words- 'erion,' meaning wool, and 'botrys', meaning cluster-from, referring to the woolly appearance of spiked inflorescence. The specific epithet means of Japan.

Some ethno usage enlisted by (Khare, 2008) that leaves used in China and India for the treatment of diabetes mellitus and skin diseases. Fruit sedative, antiemetic and Flower expectorant. The plant contains lipopolysaccharides (LPS), which exhibit antirheumatic activity. LPS is also found useful for treating diabetes mellitus and lowering high cholesterol level. The ethanolic extract of the leaves showed anti-inflammatory activity on carrageenan- induced oedema in rats and significant hypoglycaemic effect in normal rabbits like the standard drug tolbutamide. The sesquiterpene glycoside and polyhydroxylated triterpenoids showed a marked inhibition of glycosuria in genetically diabetic mice; also reduced blood glucose level in normoglycaemic rats. The hypoglycaemic effect is mediated through the release of insulin from pancreatic beta cells. The leaves gave ionone-derived glycosides and triterpenes. Maslinic and ursolic acids have also been isolated. Maslinic acid possesses significant anti-inflammatory activity. It also exhibits inhibitory effect on histamine-induced contraction in isolated ileum of guinea pig. Hot aqueous extract of the leaves showed hepatoprotective activity experimentally. The leaves yield an essential oil containing nerolidol

(61-74%). The presence of an antifungal compound, eriobofuran, is also reported. The methanolic extract of the plant exhibits antioxidant and radical scavenging activity.

5. *MALUS* Mill.

Malus pumila Miller, Gard. Dict., ed. 8. Malus no. 3. 1768.

Deciduous tree, growing up to 5 m tall. Leaves alternate, simple, dark green, 5-7.6 cm long, elliptic, ovate or broadly elliptic, glabrous above, tomentose beneath, acuminate, crenate, long petioled, stipulate, margin serrate or lobed, folded or convolute in bud. Flowers 3-4 cm diam., pedicellate. Hypanthium bowl-shaped. Sepals 5, persistent or caducous. Petals 5, white, pink or red, suborbicular to obovate. Stamens 20, half the length of petals. Ovary inferior, 5-loculed; styles 5, slightly longer than stamens. Fruit a pome, red or yellow, up to 6 cm diam.

Flowering period: March-May.

Distribution: Originated in Central Asia; cultivated worldwide in temperate regions.

Specimen examined: Mandi, tehsil Mandi, 23.05.2015, RM 081, Plate 05.

Local/Common name: Seb, Apple.

Uses: Bark anthelmintic, refrigerant, hypnotic, given in intermittent, remittent and bilious fevers. Leaves inhibit the growth of a number of Gram-positive and Gram-negative bacteria. The fruit contains malic (90-95% of the total acids), citric, lactic and succinic acids; (unripe fruit contains quinic acid, citric acid, succinic acid, lactic acid); caffeic acid derivatives, pectins, minerals and vitamins. Edible portion of fresh apple contains thiamine 0.12, riboflavin 0.03, niacin 0.2 and ascorbic acid 2 mg/100 g. The ascorbic acid content varies widely and values up to 40 mg/100 g. Sugars constitute about 80% of the total carbohydrates of ripe fruits - fructose (60), glucose (25) and sucrose (15%). The pectin content of the edible portion varies from 0.14 to 0.96% (as calcium pectate). The uronic acid content of apple pectin varies from 0.5 to 15%. The astringent principles of apple include

tannins, tannin derivatives and colouring materials (flavones). The browning of apple slices on exposure to air is due to enzymic oxidation of tannin compounds. Fresh juice contains 0.20 – 0.80 malic acid, 11.6 total sugars and 0.021-0.080% tannin. The seeds contain cyanogenic glycoside, amygdalin (0.62-1.38%, HCN equivalent 0.037-0.087%) (Khare, 2008). Raw fruits are eaten, cooked in pies and cakes, or fermented into cider. A yellow dye is obtained from the bark.

6. *PRINSEPIA* Royle.

Prinsepia utilis Royle, III. Bot. Himal. Mts. 206. 1835.

Dark-green, spinous shrub, growing 1-5 m tall. Branches greyish-green, robust; branchlets green to greyish-green, angled, brown velvety to glabrous. Spines stout, up to 3.5 cm long, subglabrous, usually leafy. Leaves alternate, simple, elliptic or narrow-lanceolate, 2.5-7.5 cm, acuminate, entire or sharply serrate, coriaceous, dark-green, glabrous, petiole 5 mm long. Flowers in short axillary racemes, white, 1 cm diam. Sepals 5, cup-shaped, lobes unequal, rounded, persistent in fruits. Petals white, rounded, shortly clawed. Stamens numerous, in 2-3 whorls, filaments short, anther cells separated by a broad connective. Carpel 1, ovules 2, pendulous. Fruit an oblong-cylindrical, 1.3-1.7 cm long drupe, fleshy, dark-purple, 8 mm diam; cotyledons oily. Flowering period: April-May.

Distribution: Pakistan to S.W. China, at 1200-2700 m altitude.

Specimen examined: Mahra, tehsil Surankote, 28.06.2015, RM 198, Plate 06.

Local/Common name: Pakran in Pahari, Himalayan-cherry prinsepia.

Uses: Oil from the plant rubbed on the body to relieve rheumatic pains, joint pain; seed oil applied on forehead to subdue cough and cold; oil taken to avoid giddy feelings, giddiness. Root decoction used to check stomach disorders; root bark to check stomach disorders. Fruit used as insect repellent. Magic, ritual, ceremonial, the branches said to be effective in doing away with

evil spirits, to drive away the ghosts; flowers and leaves used in worshipping Lord Shiva (Quattrocchi, 2012). The fruits are eaten. Its spinous branches are cut and used to block gaps in hedges and walls against goats and sheep. Fatty-oil obtained from the seeds is used for cooking, as an illuminant, and for hydrogenation and soap-making.

7. *PRUNUS* Linn.

Prunus amygdalus Batsch, Beytr. Entw. Pragm. Gesh. Natur. Reiche. 1: 30. 1801; Brandis, I.c. 190; Hook. f., Fl. Brit. Ind. 2: 313. 1878; *Amygdalus communis* L., Sp. Pl. 473. 1753; *Prunus communis* Huds. 1778.

Deciduous tree, growing 4-10 m tall. Bark dark, cracked, young twigs green, purplish and grey later. Leaves alternate or in clusters, 7.6-12.7 cm long, linear-lanceolate to lanceolate, broadest below the middle, base cuneate, apex acute, crenulate, glabrous, sometimes with glandular margin; petiole 0.5-2.4 mm long, glandular. Flowers white to pale pink, 3-5 cm across. Hypanthia 4-6 mm long. Pedicels 3-5 mm long. Petals 5, pink-white or notched at the apex. Stamens numerous, filaments 8-10 mm long, style 2.5 cm long, ovary tomentose. Fruit a drupe, 2.5-3.2 x 2-2.5 cm, obliquely ovoid, apex elongated, velvety, juicy, stone smooth, compressed.

Flowering period: February-April.

Distribution: Cultivated in India and Asia, south Europe and N Africa.

Specimen examined: Gursai, tehsil Mendhar, 01.06.2015, RM 128, Plate 07.

Local/Common name: Badam, Almond.

Uses: Kernels nutritious, demulcent and stimulant nervine tonic; valuable in diets for peptic ulcer. Unripe fruits astringent, applied to gums. Oil nutritive, demulcent, slightly laxative. Almond flour made from the residue left after expressing almond oil, and almond butter, is used for the preparation of starch-free diabetic food. The chief protein of almond is a globulin, amandin, an albumin is also reported. Amandin

has a high arginine content (11.9%). The primary chemical difference between the sweet and bitter kernel lies in the high content (2.5-3.5%) of amygdalin in bitter kernel; the ripe sweet almond being free of this cyanogenetic glucoside. Owing to the presence of amygdalin, which on enzymatic hydrolysis yields hydrocyanic acid, the bitter almond is not fit for human consumption. The oil yield from bitter kernels is usually 38 to 45% and from sweet almond 44 to 55%. The bitter almond oil containing hydrocyanic acid finds limited use in medicine as an antispasmodic and sedative. Dissolved in 50 times water, it is applied externally in pruriginous eruptions. Hydrocyanic acid-free oil is used for flavouring purposes. Partial replacement of saturated fatty acids with almonds lowers total plasma cholesterol and low-density lipoprotein cholesterol (Khare, 2008). Almonds are considered to be the world's healthiest fruits. The oil obtained from seeds is used in perfumery.

Prunus armeniaca L., Sp. Pl.: 474. 1753; Roxb. Fl. Ind. 2. 501. 1832; Brandis. For. Fl. 192. 1874; Hook. f, Fl. Brit. Ind. 2: 313. 1878; Singh & Kachroo, For. Fl. Srinagar. 133. 1976.

Small tree, growing 8-12 m tall, with dense and spreading canopy. Bark reddish. Leaves cordate to orbicular-ovate, base cordate or rounded, apex acuminate, margin crenate-serrate, pubescent beneath at angles of veins. Petiole 2-3.5 cm long, 2-3-glandular, sometimes at the base of lamina. Flowers white to pinkish, solitary, 2.5-3 cm across. Hypanthia 6-8 mm long, pubescent outside. Pedicels 1-3 mm long, pubescent. Sepals 3 x 4 mm, reddish. Petals 8-10 x 10-12 mm, orbicular, white. Stamens 27-32, filaments 8 mm long; style 8 mm long. Fruit a 2-2.5 x 3-4 cm drupe, reddish, orange-yellow, globose or amygdaloid, compressed laterally, pubescent, stone sweet.

Flowering period: March-May.

Distribution: Found wild in the N.W. Himalaya; cultivated in different parts of the world.

Specimen examined: Jandrola, tehsil Mandi, 23.05.2015, RM 080, Plate 08.

Local/Common name: Khubani, Apricot.

Uses: The powdered kernel is antitussive

antiasthmatic. The dried apricot contains, 3,4-dihydroxybenzoic, chlorogenic and vanillic acids, quercetin, quercitrin, rutin, hyperoside and kaempferol. Apricot leaves contain quercetin, cynadin, kaempferol, caffeic acid and *p*-coumaric acid (Khare, 2008). Fruits are edible; oil obtained from seeds is used for cooking, burning and for hair.

Prunus avium Linn., Fl. Suec. ed. 2: 165. 1755; Hook. f. Fl. Brit. Ind. 2: 313. 1878.

Deciduous tree, growing 5-25 m high. Bark smooth, purplish brown on young trees, becoming thick, dark blackish-brown and fissured when old. Leaves alternate, simple, oblong to obovate, base cuneate, apex abruptly acuminate, margin serrate, sometimes glandular, pubescent beneath on veins and mid-rib. Petiole 0.5-2 cm long, 2-glandular; stipules serrate, glandular. Flowers fascicled, 15-20 mm across, pedicels slender, glabrous. Hypanthium 5 mm long, constricted at top. Sepals ovate, entire, reflexed, 5 x 3 mm, carminered. Petals obovate, notched, 1.2 x 7 mm, white. Stamens 21, filaments 6-7 mm long. Style 7 mm long, curved. Fruit a drupe, 2.5 cm across, globose, smooth, purple-black, flesh soft, sweet.

Flowering period: April-May.

Distribution: Native of Eurasia. In India cultivated in Jammu & Kashmir, Himachal Pradesh, U.P and Tamil Nadu.

Specimen examined: Khari Karmara, tehsil Haveli, 22.07.2015, RM 209, Plate 09.

Local/Common name: Glaas in Pahari, Sweet Cherry.

Uses: Fruit stalks diuretic, anti-inflammatory, astringent, used for oedema, inflammation of urinary tract, cystitis, nephritis, urinary retention. The stems contain salicylic acid, organic acids tannins and potassium salts. Protocatechuic, *p*-coumaric, ferulic and diferulic acids have been identified in the shoots. The fruit contains salicylates and cyanogenic glycosides, and vitamin A, B₁ and C. Sugars consist mainly of glucose and fructose,

with sucrose as a minor component. Malic acid is the principal acid, small amounts of citric, tartaric and succinic acids are also reported. The lipids of the fruit pulp contain *cis*-vaccenic acid. The acetone extract of peduncle gave an isoflavone, prunetin, which on hydrolysis yielded an aglycone identified as prunetin and sugar as glucose. The seeds contain a cyanogenic glycoside and are toxic. The bark contains tannins up to 16% (Khare, 2008). Fruits are edible. Wood is valued for hard wood turning, and making cabinets and musical instruments. The gum from bark wounds is aromatic and can be chewed as a substitute for chewing gum. A green dye can also be prepared from the plant.

Prunus bokhariensis Royle ex C. K. Schneider, Report. Spec. Vov. Regni Veget. 1: 51. 1906; Hook. f., Fl. Brit. Ind. 2: 315. 1878; Rehder, Man. ed. 2. 457. 1940.

Small tree, with branches brownish, glabrous. Leaves elliptic-lanceolate or oblong, 5-8 x 2-3 cm, base cuneate, apex acuminate, margin closely crenate-dentate. Mid-rib and veins white-tomentose beneath. Petiole 6-13 mm long, pilose. Flowers solitary, rarely in fascicles, 1.5 cm across. Hypanthium glabrous, pedicel 10-13 mm long. Sepals oblong, margin entire, base pilose inside. Petals white, oblong. Stamens many, in 2 rows. Style pilose at base. Ovary glabrous. Fruit a drupe, ovoid, 1.5 x 2 cm. Stones smooth.

Flowering period: February-March.

Distribution: India, Pakistan, Asia-tropical. In India, grown in Jammu & Kashmir and Himachal Pradesh.

Specimen examined: Banwat, tehsil Haveli, 30.03.2015, RM 054, Plate 10.

Local/Common name: Alubukhara, Jardalu in Pahari.

Uses: Edible Fruit - raw or cooked. They are used in pies, preserves etc. and can also be dried for later use. The fruit contains a single large seed. Seed - raw or cooked. Do not eat the seed if it is too bitter. Although no specific mention has been

seen for this species, all members of the genus contain amygdalin and prunasin, substances which break down in water to form hydrocyanic acid (cyanide or prussic acid). In small amounts this exceedingly poisonous compound stimulates respiration, improves digestion and gives a sense of well-being.

Although no specific mention has been seen for this species, it belongs to a genus where most, if not all members of the genus produce hydrogen cyanide, a poison that gives almonds their characteristic flavour. This toxin is found mainly in the leaves and seed and is readily detected by its bitter taste. It is usually present in too small a quantity to do any harm but any very bitter seed or fruit should not be eaten. In small quantities, hydrogen cyanide has been shown to stimulate respiration and improve digestion, it is also claimed to be of benefit in the treatment of cancer. In excess, however, it can cause respiratory failure and even death (NMH, 2022a).

Prunus cornuta (Wall. ex Royle) Steudel, Nom. Bot. ed. 2, 2: 403. 1841; Hara, Enum. Fl. Pl. Nepal 2:141. 1979.

Moderate sized tree, growing up to 18 m tall. Bark rough, grey-brown to brown. Leaves 8-15 cm long, oblong to lanceolate, long-pointed, base cordate, pubescent in axils of mid-rib. Stipules linear, soon falling off. Inflorescence a many-flowered axillary raceme. Hypanthia 3-4 mm long, glabrous. Flowers 5-6 mm across, white. Calyx turbinate; petals round, concave. Stamens many, filaments 1 mm long; style 2 mm long; stigma peltate and lobed. Fruit a globose drupe, red, turning to dark purple or black, stone thick.

Flowering period: April-June.

Distribution: Afghanistan, N. India, Nepal, Sikkim and Bhutan. In India found in Jammu & Kashmir, Himachal Pradesh, Punjab, Uttar Pradesh, Tamil Nadu, West Bengal and Assam.

Specimen examined: Mahra, tehsil Surankote, 28.05.2015, RM 098, Plate 11.

Local/Common name: Jamoo in Pahari, Himalayan Bird Cherry.

Uses: Young leaves reported to be highly toxic to animals, sometimes cause death. Oil from the seed kernels used externally as a massage to keep body warm during winter season, also taken for stomach disorders. Dry root powder with honey given for intestinal worms in children (Quattrocchi, 2012). The fruits are edible. Leaves are lopped for fodder; wood is seldom used. The fruit is often infected by an insect and becomes long and horn-like, hence the specific name 'cornuta'.

Prunus domestica Linn., Sp. Pl. 475. 1753.

Deciduous tree, growing up to 12 m tall. Bark grey, branches smooth, puberulous. Leaves ovate-lanceolate, base cuneate, apex acute, margin serrate, pubescent on veins beneath, midrib glabrous. Petioles 1.0-1.5 cm long. Flowers hermaphrodite, in pairs, 1.5-2 cm across. Hypanthia 3 mm long, pedicel 5-8 mm long. Sepals 1-2 x 2-2.5 mm, pubescent inside. Petals 4-5 x 3-4 mm, greenish-white. Stamens 22-55, filaments 5 mm long; style 1 mm long. Fruit an erect drupe, 1-1.5 x 1.5-2 cm, fleshy, sweet, stone smooth.

Flowering period: March-April.

Distribution: In India, cultivated in Kashmir, Himachal Pradesh and Kumaon.

Specimen examined: Qazi Mohra, tehsil Haveli, 30.03.2015, RM 055, Plate 12.

Local/Common name: Plum, Prune, Kashmir Plum.

Uses: Fruits are edible refrigerant, laxative, nutritive. Improves haemoglobin levels in iron deficiency. Promotes excretion of excess calcium by the kidneys. An adjuvant for atherosclerosis and arthritis. Root-astringent. The fruit pulp contains about 44% sugar and malic acid as major constituents. Kernel contains fixed oil about 45% and amygdalin and benzoic acid among others. The crude extract of the fruit was found effective in controlling centrally induced emesis in dogs. The action was comparable to that of Metoclopramide (Maxolon) and chlorpromazine (Largactil) (Khare, 2008).

Prunus persica (L.) Stokes, Bot. Mat. Med. 3: 100 100 1812.

Small, deciduous tree, 5-6 m tall. Bark brown to black, thin bark can be peeled off exposing the dark surface underneath. Stem erect, cylindrical, branched, smooth, green. Leaves simple, alternate, oblong, lanceolate, serrulate, coriaceous, 9.5 cm long, 3.5 cm broad, dark green, petiole 5 mm long. Inflorescence solitary axillary. Flowers white-pink, sessile, ebracteate, complete, pentamerous, hermaphrodite, perigynous. Sepals 5, gamosepalous; petals 5 polypetalous. Stamens about 40, in 4 whorls, each whorl carrying 10 stamens in 5 pairs of 2 each, polyandrous; filaments long, dithecal, dorsifixed. Carpel 1, rarely 2, ovary semi-inferior, style long, stigma capitate; ovary and lower portion of style hairy. Fruit a shortly-stalked drupe, about 3.8 cm long, green turning yellow on maturity, pubescent, globular to oval, having a prominent suture all around the fruit; stone rough, very hard and deeply-furrowed.

Flowering period: February-March.

Distribution: Although the specific epithet suggests its origin from Persia, (present Iran), but genetic studies reveal that peaches are native to north-west China. In India, cultivated in Kashmir, Himachal Pradesh and Kumaon.

Specimen examined: Qazi Mohra, tehsil Haveli, 27.03.2015, RM 049, Plate 13.

Local/Common name: Aru in Pahari, Peach.

Uses: Fruit mild tranquillizer, expectorant, diuretic, antipyretic. Bark or leaves used as tea for morning sickness, dry and hard cough, whooping cough and bronchitis. Leaves used in leucoderma. Flowers galactagogue. Peach seeds are a constituent of a traditional Chinese herbal drug used for the treatment of gynaecological disorders such as severe hypermenorrhoea, dysmenorrhoea and infertility. Peach fruit extract containing nitrile glycosides, such as prunasin and amygdalin, has been reported to inhibit the growth of Sarcoma-180 cells in culture. Fast-acting, effective wrinkle-eliminating cosmetic

formulations contain peach kernel extract as one of the components. The heartwood contains beta-sitosterol and its D-glucoside, hentriacontane, hentriacontanol, and the flavonoids naringenin, dihydrokaempferol, kaempferol and quercetin (Khare, 2008). Fruits are edible, and oil obtained from the seeds is used for cooking and as an illuminant. Oil is also an abortifacient and is effective against piles, in cure for deafness and stomach trouble in children. The leaves also possess anthelmintic, insecticidal properties, and are used in the treatment of leukoderma and piles. Flowers are used as purgative and fruits considered to be as a brain tonic. The specific epithet 'persica' refers to its widespread cultivation in Persia.

8. *PYRUS* Linn.

Pyrus communis Linn., Sp. Pl. 419. 1753; Hook.f. l.c. 374.

Deciduous tree, growing up to 10 m tall, 3-5 m tall in cultivation, with a pyramidal crown. Trunk erect, conical, branches reddish-brown, narrow-angled. Bark grey-brown, with shallow furrows and flat-topped scaly ridges. Leaves alternate, simple, variable in size, 2.5-10 cm long, elliptic-ovate, margin serrated, tip obtuse, shiny green above, paler and dull beneath, glabrous; petiole very long, slender. Flowers white, showy, hermaphrodite in corymbose inflorescence, appearing before the leaves. Calyx-lobes persistent. Petals white, obovate. Ovary inferior, 5-locular. Fruit a 2.5-5 cm, green-yellowish or reddish pome, sub-globose, ovoid or pyriform, seeds blackish.

Flowering period: April-May.

Distribution: Native of central and eastern China, S. W. Asia.

Specimen examined: Jandrola, tehsil Mandi, 28.05.2015, RM 100, Plate 14.

Local/Common name: Nakh in Pahari, Nashpati, Common pear.

Uses: Edible fruits a good source of pectin, help in maintaining a desirable acid balance in the body.

Recommended to patients suffering from diabetes because of low sucrose content and included in low antigen content diets to alleviate the symptoms in the management of immune-mediated disease. Fresh pear juice exhibited good activity against *Micrococcus pyogenes* var. *aureus* and *Escherichia coli*. An aqueous extract of the leaves was active against some strains of *E. coli*. The leaves contain arbutin, isoquercitrin, sorbitol, ursolic acid, astragaloside and tannin (0.8-2.9%). The bark contains friedelin, epifriedelanol and beta-sitosterol. Phloridzin is present in the root bark. The plant extract controls the development of freckles and blemishes on the skin and prevents melanin formation. It finds application in skin lightening creams (Khare, 2008).

Pyrus pashia Buch. Ham. ex D. Don., Prodr. Fl. Nep. 236. 1825; Hook. f., l.c. 374.

Small to medium-sized, deciduous tree, growing up to 12 m tall. Bark almost black, branches dark-brown, smooth. Leaves variable, 5-10 cm long, ovate to broadly lanceolate, long-pointed, toothed, glabrous, young leaves woolly; petiole slender, often reddish. Flowers 2-2.5 cm across. Calyx urceolate, with white woolly triangular lobes; petals obovate, with darker veins. Stamens 25-30; styles 3-5, woolly. Fruit a globose, dark-brown pome, 1.3-2.5 cm, with raised lenticels.

Flowering period: March-April.

Distribution: Distributed across Himalaya from Pakistan, Kashmir, Northern India; also from Vietnam and Iran.

Specimen examined: Banwat, tehsil Haveli, 26.06.2015, RM 179, Plate 15.

Local/Common name: Batangi in Pahari, Kali kainthhi, Wild Himalayan Pear.

Uses: Wood is used for burning; making walking sticks and tobacco pipes. Leaves are used as fresh fodder. Leaf extract is used as tonic for falling hair (Khan *et al.*, 2011). Bark bears anti-bacteria and anti-fungal properties and flowers Antioxidant with Scavenging activity of free radicals. Besides edible fruit wood is used for fuel and for making

small implements. The cultivar is used as best rootstock for pear cultivation.

9. *ROSA* Linn.

Rosa eglanteria Linn., Sp. Pl. 491. 1753, FBI 2: 366; Brandis, For. Fl. 201. 1874. *Rosa foetida* Herm., Diss. Bot. 18. 1762.

Deciduous shrub, armed with large and small prickles, growing 2-3 m in height. Leaves 4-8 cm long; leaflets 2-4 pairs, elliptic or oblong-obovate, deeply serrate, glandular pubescent beneath. Flowers solitary or 2-3 together, fragrant and hermaphrodite. Calyx-lobes lanceolate, hairy. Petals 5, obcordate, yellow, pink.

Flowering period: May-June.

Distribution: Native of Europe and western Asia; quite widespread in N. America and New England. Common in Juniper forests.

Specimen examined: Pir Ki Gali, tehsil Surankote, 06.07.2015, RM 204, Plate 16.

Local/Common name: Panjali Gulab in Pahari, Fragrant sweet briar rose.

Uses: Fruit - cooked. It is used in making jellies etc. The taste is best after a frost. The fruit is up to 25mm in diameter, but there is only a thin layer of flesh surrounding the many seeds. Some care has to be taken when eating this fruit, see the notes above on known hazards. A pleasant tasting fruity-flavoured tea is made from the fruit, it is rich in vitamin C. Petals - raw or cooked. Remove the bitter white base. Used in confectionery. Young shoots - raw. Used as they come through the ground in spring. The seed is a good source of vitamin E, it can be ground into a powder and mixed with flour or added to other foods as a supplement. Be sure to remove the seed hairs (NMH, 2022b). Cultivated as ornamental, valued for its scent and prickles on the stem make a useful low security hedge. The tea made from the hips of this rose is very popular in Europe.

Rosa indica Lindl, Ros. Monogr. 106. 1820.

Woody perennial shrub, with prickles almost absent or curved, growing 1-2 m tall. Leaves alternate, petiolate, evergreen; leaflets 3-5, shiny

above, paler beneath, glabrous, margin serrate. Inflorescence solitary or many-flowered in short panicles. Flowers white to red, pedicellate, bracteate, hermaphrodite, perigynous or epigynous. Sepals 5, entire with filiform apex, deciduous, reflexed. Petals 5 or multiple of 5, free, imbricate. Stamens many; styles long, free. Fruit ovoid to pyriform, with smooth red hip.

Flowering period: June-August.

Distribution: Western China, Himalaya and Nepal. Introduced and cultivated in India and Pakistan.

Specimen examined: District Hospital Poonch, tehsil Haveli, 21.06.2014, RM 031, Plate 17.

Local/Common name: Chini-Gulab in Pahari, Rose.

Uses: Extensively cultivated as an ornamental plant. Constipation, body inflammation, heart and eye diseases, and leucorrhoea. Essential oil, phenolic antioxidants, hydrolysable, tannins, flavonols, and anthocyanins (CHH, 2022).

Rosa macrophylla Lindl., Monogr. Rosa 35. t. 6. 1820; Fl. Hook. F., Brit. Ind. 2: 366. 1878; *Rosa hookeriana* Bertol., Misc. Bot. 24: 172, 173. t. 1. 1863; C. Ghora et Panigrahi, in Bull. Bot. Surv. Ind. 28(1-4): 178. 1986.

Deciduous, armed shrub, 3-5 m tall with dark red or purple stems and few prickles. Prickles variable in number, straight or slightly curved with narrow or broad bases. Leaves 8-20 cm, with 7-11, ovate-elliptic, finely-toothed leaflets, to 5 cm or more long, hairy and glandular beneath. Flowers solitary or in terminal corymbs, bright red or pink, 3-7 cm across. Calyx-lobes longer than petals, often with leafy tips. Petals 5, broadly obcordate; styles hairy, exserted. Fruit large, to 5 cm long, red, flask-shaped, bristly and with conspicuous persistent calyx.

Flowering period: June-July.

Distribution: Pakistan to S.W. China, at 2100-3800 m altitude.

Specimen examined: Pir Ki Gali, tehsil Surankote, 04.09.2015, RM 223, Plate 18.

Local/Common name: Ban Gulab, Himalayan rose, Big hip rose.

Uses: Flowers are used in the extraction of perfumes. Fruits are rich in vitamin C and edible. Fresh flower juice is prepared and given orally to cure internal fever. Fruits rich in vitamin C (769 mg/100 g) (Khare, 2008).

Rosa moschata Miller ex J. Hermn., Diss. Bot. Med. Rosa 15. 1762.

Deciduous, arching or climbing shrub, up to 3 m tall. Bark greyish brown, prickles stout, recurved. Leaves 5-12 cm long; leaflets 5-7, ovate or ovate-lanceolate, puberulous beneath, serratures numerous, base rounded, stipules glandular. Flowers white, sweet-scented, in terminal corymbs. Calyx-lobes 5, about 2 cm long, narrowly lanceolate. Petals 5, pure white, obovate, generally with a distinct tip. Stamens yellow, much shorter than the petals; styles exerted, united into a hairy column. Fruit a globose, dark brown hip.

Flowering period: April-June.

Distribution: Wild origin of this species is uncertain but believed to be western Himalaya.

Specimen examined: Chaktro, tehsil Mandi, 26.05.2014, RM 015, Plate 19.

Local/Common name: Tarnari in Pahari, Musk Rose.

Uses: Plant used in bilious affections, irritation of the skin and eye diseases. Rose water and otto is extracted from the flowers in Himachal Pradesh (Khare, 2008). The flowers are scented and yield an essential oil. The wood is used for making walking sticks. This species is often confused with the Himalayan musk rose, *i.e.*, *Rosa brunonii*, a closely related tall climbing species from the Himalaya, that also possesses a similar musky scent.

Rosa multiflora Thunb., Fl. Jap. 214. 1784. Lindl, Ross. Monogr. 119. 1820; Crep. Prim. Monogr. Ros.

257. 1874; E. Willm., the genus Rosa, 1. 2: 23. 1911; Ghora & G. Panigrahi, Rosaceae Ind. 2: 350. 1995.

Scrambling shrub, growing 3-5 m tall, with recurved prickles. Leaves 5-10 cm long; leaflets 5-9, ovate to obovate, apex acute, obtuse or acuminate, simply or rarely double serrate, glabrous or sparsely pubescent above, pubescent beneath. Flowers in panicles, rarely in corymbs, 2 cm across, white to pink, fragrant. Sepals with lateral lobes, reflexed after flowering, caducous in fruit. Styles hairy, connected in a long column, orifice narrow. Fruit a small, globose hip, 6-7 mm diam., red when mature.

Flowering period: May-June.

Distribution: Native of eastern Asia, in China, Japan and Korea. Cultivated in India, Pakistan, and Nepal. Classified as a noxious weed in several states of America.

Specimen examined: Poonch Town, tehsil Haveli, 28.05.2015, RM 108, Plate 20.

Local/Common name: Multiflora-rose, Japanese-rose, Many-flowered rose, Seven-sister rose.

Uses: Fruit antiseptic, applied to wounds, injuries, sprains and foul ulcers. The fruit yielded beta-sitosterol, scoparone, salicylic and gallic acid. Fruits contained multiflorin; flower petals gave astragalin. A purgative compound, multinoside Aacetate, has been isolated from the fruit. Quercetin-3- O-xyloside, isoquercitrin and hyperin were also isolated. Floral absolute oil contains eugenol (22.8), phenylethanol (18.1) and heneicosane (10.2%). The root gave a triterpenoid, tormentic acid. The plant extract, along with kojic acid or its derivatives, produced excellent skin-lightening and sun-burn preventing effects (Khare, 2008). Planted as an ornamental plant. Used as a root stock for grafting rose cultivars.

10. RUBUS Linn.

Rubus ellipticus Sm. in Rees., Cyclop. 30. n. 16. 1819; FBI. 2:336. 1878; *Rubus gowreepful* Roxb., Fl. Ind. 2: 517. 1832.

Tall, suberect, evergreen shrub, growing up to 2.2 m. Stem and branches trailing, covered with numerous long bristles, often with glandular hairs. Leaves alternate, pinnately compound; leaflets 3, coriaceous, terminal leaflet largest, orbicular to obovate, elliptic or ovate, apex retuse, margin serrate, hairy along the nerves, sparsely hairy above, grey-tomentose beneath, petiole bristled. Inflorescence an axillary and terminal panicle. Flowers white, actinomorphic, hermaphrodite, calyx-tube spreading, limb 5-lobed, persistent. Petals 5, free, obovate, longer than sepals. Stamens many, free, anthers dithecous, filaments long, glabrous. Carpels many, free, ovary superior; style thread-like, 3 mm long. Fruits numerous, globular drupelets, yellow, clustered.

Flowering period: February- March.

Specimen examined: Mangnar, tehsil Haveli, 05.05.2015, RM 066, Plate 21.

Distribution: Eastern Asia-Himalaya from Pakistan to China; also in southern India and Sri Lanka.

Local/Common name: Peela Aakhara, Garacha in Pahari, Yellow/Golden Himalayan Raspberry.

Uses: Root and young stem administered in colic pain. Extract of the leaves showed anti-convulsant activity against electrical induced convulsions, potentiated hypnotic effect of pentobarbitone sodium and had positive inotropic and chronotropic effects (Rastogi and Mehrotra, 1998-2000). The fruit has an agreeable flavour and is greedily eaten wherever the plant grows.

Rubus niveus Thunberg., Diss. Bot-Med. de Rubo 9. 1813.

Very variable shrub, rambling or sub-erect, 1-2.5 m tall. Stem and branches usually glabrous, prickles small, few. Leaves trifoliate; lateral leaflets lanceolate or ovate, 2.9 cm long; terminal leaflet lanceolate, oblong or ovate, membranous, 4.9 cm long, serrate. Inflorescence a corymbose panicle, having 15 flowers each. Flowers

pedicellate, ebracteate, complete, hermaphrodite, hypogynous. Sepals 5, lobes tomentose. Petals 5, polypetalous, pink, much smaller than the calyx-lobes, inferior. Stamens many, arranged in circle, dorsifixed, dithecous. Fruit an etaerio of drupes, deep pink to nearly black. Seeds numerous, very small.

Flowering period: April-May.

Distribution: Grows wild throughout temperate Himalaya. Besides India, grows in central and western China and Philippines Island.

Specimen examined: Jhullas, tehsil Haveli, 12.09.2015, RM 241, Plate 22.

Local/Common name: Aakharay in Pahari, Raspberry.

Uses: *Rubus niveus* (Mysore Raspberry, Mahabaleshwar Raspberry) is common in evergreen forests of Mahabaleshwar. European Raspberry is equated with *Rubus idaeus* Linn. The leaves contain flavonoids, mainly glycosides of kaempferol, quercetin and tannins. Raspberry leaf tea has been used in Europe to facilitate child birth. Its uterine relaxant effects have been demonstrated in animals (the extract appears to effect only the pregnant uterus, no activity has been observed on the nonpregnant uterus (Khare, 2008). Fruits are edible and very nutritious. The fruits and leaves have strong astringent properties, their infusions are used to relieve diarrhoea.

Rubus ulmifolius Schott. in Oken., IsIs Fasc. 5: 821. 1818.

Scrambling shrub up to 5 m tall, young stems velvety. Leaves imparipinnate; leaflets 3-5, green on upper surface, and white tomentose beneath, highly variable, ovate or elliptic-obovate, toothed or serrate, stipules linear. Flowers borne in clusters, in oblong or pyramidal inflorescence, pentamerous, bisexual. Sepals long-pointed, grey or whitish-tomentose. Petals oval, white or bright pink, 1-1.5 cm long, strongly crinkled; filaments filiform, ovary apically hairy. Fruit 1-1.5 cm drupelet, turning red to black, globose to ovoid.

Flowering period: May-July.

Distribution: Native to Europe and North Africa; naturalized in parts of America, Australia and southern South America, also so in Kashmir.

Specimen examined: Banwat, tehsil Haveli, 20.09.2015, RM 246, Plate 23.

Local/Common name: Kanichhi in Pahari, Elm-leaf Blackberry.

Uses: A decoction of the root is used for dysentery and whooping cough. The plant gave a triterpenic acid, rubitic acid, characterized as 7- α -hydroxyursolic acid [Khare, 2008]. Fruits are edible and has minor tranquilizer effect. Red colour fruit is a symbol of blood strength and is commonly used as blood tonic in local area (AJKMAPH, 2022).

11. *SORBARIA* Seringe

Sorbaria tomentosa Lindl., Rehder, Journ. Arnold Arb. 19: 75. 1938; Rehder, Man. Cult. Trees and Shrubs 344, 1940; Kitamura, Fl. Afghan. 183. 1960.

Slender, graceful, deciduous shrub, about 3 m tall or more, often gregarious in forest openings. Leaves pinnately compound, 20-40 cm long; leaflets 13-23, opposite, sessile, 5-10 cm long, apex acuminate, margin serrate, glabrous. Inflorescence a terminal panicle, 10-30 cm long. Flowers small, actinomorphic, hermaphrodite, white or cream-coloured, 4-6 mm diam. Calyx 5-lobed, persistent. Petals 5, free, orbicular. Stamens many, white. Carpels 5, 3-4 mm, glabrous; style short. Fruits 2-5, follicles small, many-seeded.

Flowering period: May-June.

Distribution: Native to the Himalaya; occurs in central and south Scotland, central and south England.

Specimen examined: Bufliaz, tehsil Surankote, 30.05.2015, RM 113, Plate 24.

Local/Common name: Kashmir false spiraea, Himalayan sorbaria.

Uses: The plant is harvested from the wild for local use as a medicine and source of fuel. It is used in barrier plantings in the Himalayas to help keep animals out of gardens and fields and is sometimes grown as an ornamental in gardens. Flowers are finely ground in milk, and the paste is applied to burns and wounds.

The leaves and flowers contain cyanogenic glycosides. When ingested, these compounds break down in the digestive tract to release cyanide. Used in small quantities in both traditional and conventional medicine, this exceedingly poisonous compound has been shown to stimulate respiration, improve digestion, and promote a sense of well-being. It is also claimed by some to be of benefit in the treatment of cancer - though this claim has been largely refuted. In larger concentrations, however, cyanide can cause gasping, weakness, excitement, pupil dilation, spasms, convulsions, coma and respiratory failure leading to death (UTPD, 2022).

12. *SPIRAEA* Linn.

Spiraea canescens D. Don., Prodr. Fl. Nep. 227. 1825; Hook. f., l.c. 325.

Stiff, small, deciduous shrub, 1-5 m tall. Branches striate, grey-canescens, arching. Leaves alternate, simple, shortly petiolate, elliptic to obovate, 6-16 mm, entire or toothed towards the apex, hairy, paler beneath, lateral nerves 2-4 pairs. Flowers small, white or pale pink, 4-6 mm across, borne on short side branches, forming long terminal clusters. Stamens not longer than the rounded petals. Ripe carpels long-haired, partly sunk in calyx-tube. Follicles slightly spreading, glabrous to pubescent or pilose.

Flowering period: May-June.

Distribution: Eastern Asia-China to the Himalaya; found in thickets, valleys, riverbanks, stream sides and dry places at 1500-3000 m altitude.

Specimen examined: Pir Ki Gali, tehsil Surankote, 05.06.2015, RM 151, Plate 25.

Local/Common name: Grey stem spiraea.

Uses: Wood is fairly hard, close and hard-grained, and used for making light walking sticks. The slender branches are often used to stir soup and in making the rim of baskets. Grown for their mass of small, bee-attracting flowers and in some species, their foliage.

Spiraea cantoniensis Loureiro., Fl. Cochinch. 1: 322. 1790.

Deciduous shrub, up to 1.5 m tall, with branches thin, arched, flexible and glabrous. Leaves alternate, simple, shortly stalked, dark green adaxially, grey blue abaxially, lanceolate, elliptic-rhomboid or slightly obovate. Flowers arranged in axillary corymb, bisexual, 5-7 mm diam. Hypanthium campanulate, glabrous or abaxially pubescent. Sepals 5, free, triangular or ovate-triangular. Petals 5, white, sub-orbicular to

obovate. Stamens 20-28; styles shorter than stamens. Follicles straightly spreading, glabrous.

Flowering period: April-May.

Distribution: Native of China and Japan; grown elsewhere as an ornamental shrub.

Specimen examined: Krishan Chander Park in Poonch Town, tehsil Haveli, 30.05.2015, RM 127, Plate 26.

Local/Common name: Reeves spirea.

Uses: Grown as an ornamental species for centuries. In the screening experiments for rat intestinal alpha-glucosidase inhibitors in 218 plants cultivated in the Japanese temperate region, potent maltase-inhibiting activity was found in the extract of flowers of *Spiraea cantoniensis* (Yoshida *et al.*, 2008).



Plate 01: *Armeniaca vulgaris*



Plate 02: *Cotoneaster microphyllus*



Plate 03: *Cydonia oblonga*



Plate 04: *Eriobotrya japonica*



Plate 05: *Malus pumila*



Plate 06: *Prinsepia utilis*



Plate 07: *Prunus amygdalus*



Plate 08: *Prunus armeniaca*



Plate 09: *Prunus avium*



Plate 10: *Prunus bokhariensis*



Plate 11: *Prunus cornuta*

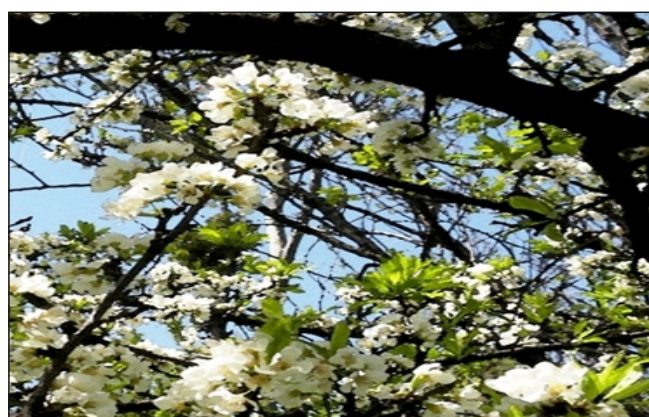


Plate 12: *Prunus domestica*



Plate 13: *Prunus persica*



Plate 14: *Pyrus communis*



Plate 15: *Pyrus pashia*



Plate 16: *Rosa eglantheria*



Plate 17: *Rosa indica*



Plate 18: *Rosa macrophylla*



Plate 19: *Rosa moschata*



Plate 20: *Rosa multiflora*

Plate 21: *Rubus ellipticus*Plate 22: *Rubus niveus*Plate 23: *Rubus ulmifolius*Plate 24: *Sorbaria tomentosa*Plate 25: *Spiraea canescens*Plate 26: *Spiraea cantoniensis*

Thus, present study revealed that there is a rich floristic diversity of family Rosaceae in district Poonch. Many researchers have carried out their researches regarding the exploration of floristic diversity of Jammu and Kashmir that supported the current study. Besides, this region is also well known for a good range of fauna, however, occurrence and distribution of various biota are more or less influenced by climate change and anthropogenic activities that in turn affect the sustainable development (Ashok, 2019; Verma, 2021; Prakash and Verma, 2022).

CONCLUSION

The current research concluded that there is rich floristic diversity of the angiospermic flora in Jammu and Kashmir and particularly in the district Poonch. Among the angiospermic families, the Rosaceae family is predominantly distributed ranging from the shrub to the tall tree. Being the plant diversity rich region, there is tremendous scope and needs to explore the whole flora of the district Poonch along with ethnobotanical and medicinal importance.

Table 1: Arboreal flora arranged alphabetically with genera and species.

Families		Families		Species	
S. No.	Name	S. No.	Name	S. No.	Name
1.	Rosaceae	1.	<i>Armeniaca</i>	1.	<i>Armeniaca vulgaris</i>
		2.	<i>Cotoneaster</i>	2.	<i>Cotoneaster microphyllus</i>
		3.	<i>Cydonia</i>	3.	<i>Cydonia oblonga</i>
		4.	<i>Eriobotrya</i>	4.	<i>Eriobotrya japonica</i>
		5.	<i>Malus</i>	5.	<i>Malus pumila</i>
		6.	<i>Prinsepia</i>	6.	<i>Prinsepia utilis</i>
		7.	<i>Prunus</i>	7.	<i>Prunus amygdalus</i>
				8.	<i>Prunus armeniaca</i>
				9.	<i>Prunus avium</i>
				10.	<i>Prunus bokhariensis</i>
				11.	<i>Prunus cornuta</i>
				12.	<i>Prunus domestica</i>
				13.	<i>Prunus persica</i>
		8.	<i>Pyrus</i>	14.	<i>Pyrus communis</i>
				15.	<i>Pyrus pashia</i>
		9.	<i>Rosa</i>	16.	<i>Rosa eglanteria</i>
				17.	<i>Rosa indica</i>
				18.	<i>Rosa macrophylla</i>
				19.	<i>Rosa moschata</i>
				20.	<i>Rosa multiflora</i>
		10.	<i>Rubus</i>	21.	<i>Rubus ellipticus</i>
				22.	<i>Rubus niveus</i>
				23.	<i>Rubus ulmifolius</i>
		11.	<i>Sorbaria</i>	24.	<i>Sorbaria tomentosa</i>
		12.	<i>Spiraea</i>	25.	<i>Spiraea canescens</i>
				26.	<i>Spiraea cantoniensis</i>

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Table 2: Inventory of the Angiospermic arboreal flora of family Rosaceae of district Poonch.

S. No.	Name of species	Habit	Dicot	Deciduous / evergreen	Native / Exotic	Specimen number	Location in district	Altitude (m)
1.	<i>Armeniaca vulgaris</i>	Te	Di	Ds	Ne	RM 056	Banwat	1107
2.	<i>Cotoneaster microphyllus</i>	Sb	Di	En	Ne	RM 155	Doogran Poshiana	2383
3.	<i>Cydonia oblonga</i>	Te	Di	Ds	Ec	RM 213	Gursai	1606
4.	<i>Eriobotrya japonica</i>	Te	Di	En	Ec	RM 099	Poonch Town	1022
5.	<i>Malus pumila</i>	Te	Di	Ds	Ec	RM 081	Mandi	1423
6.	<i>Prinsepia utilis</i>	Sb	Di	Ds	Ne	RM 198	Mahra	3090
7.	<i>Prunus amygdalus</i>	Te	Di	Ds	Ec	RM 128	Gursai	1582
8.	<i>Prunus armeniaca</i>	Te	Di	Ds	Ec	RM 080	Jandrola	1263
9.	<i>Prunus avium</i>	Te	Di	Ds	Ec	RM 209	Khari Karmara	1005
10.	<i>Prunus bokhariensis</i>	Te	Di	Ds	Ec	RM 054	Banwat	1095
11.	<i>Prunus cornuta</i>	Te	Di	Ds	Ne	RM 098	Mahra	2918
12.	<i>Prunus domestica</i>	Te	Di	Ds	Ec	RM 055	Qazi Mohra	1012
13.	<i>Prunus persica</i>	Te	Di	Ds	Ec	RM 049	Qazi Mohra	1026
14.	<i>Pyrus communis</i>	Te	Di	Ds	Ec	RM 100	Jandrola	1250
15.	<i>Pyrus pashia</i>	Te	Di	Ds	Ne	RM 179	Banwat	1118
16.	<i>Rosa eglanteria</i>	Sb	Di	Ds	Ec	RM 204	Pirki Gali	3475
17.	<i>Rosa indica</i>	Sb	Di	Ds	Ec	RM 031	District Hospital	1021
18.	<i>Rosa macrophylla</i>	Sb	Di	Ds	Ec	RM 223	Pirki Gali	3463
19.	<i>Rosa moschata</i>	Sb	Di	Ds	Ne	RM 015	Chaktro	1180
20.	<i>Rosa multiflora</i>	Sb	Di	Ds	Ec	RM 108	Poonch town	977
21.	<i>Rubus ellipticus</i>	Sb	Di	En	Ne	RM 066	Mangnar	1137
22.	<i>Rubus niveus</i>	Sb	Di	Ds	Ne	RM 241	Jhullas	965
23.	<i>Rubus ulmifolius</i>	Sb	Di	Ds	Ec	RM 246	Banwat	1100
24.	<i>Sorbaria tomentosa</i>	Sb	Di	Ds	Ne	RM 113	Bufliaz	1664
25.	<i>Spiraea canescens</i>	Sb	Di	Ds	Ec	RM 151	Pirki Gali	3429
26.	<i>Spiraea cantoniensis</i>	Sb	Di	Ds	Ec	RM 127	K.C. Park	985

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