



Review Article

A REVIEW ON PADMAKA (*PRUNUS CERASOIDES* D. DON): DIFFERENT SPECIES AND THEIR MEDICINAL USES

Chityanand Tiwari^{1*}, Suresh Chubey², Rajeev Kurele³, Rakhi Nautiyal¹

¹M.D. Scholar, ²Professor, Department of Dravyagun, Rishikul Campus Uttarakhand Ayurved University Dehradun,

³Manager QC, QA and F & D, Person-In-charge, AYUSH DTL (Govt. Approved Lab), Indian Medicines Pharmaceutical Corporation Limited, Mohan, Distt. Almora Uttarakhand India.

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ABSTRACT

Padmak (*Prunus cerasoides* D. Don) usually called as the *Himalayan* cherry tree is a drug with a significant ethno-botanical and therapeutic importance. In India plant is restricted to submontane and montane *Himalayan* ranging from 500-2000 m. In *Garhwal* hill it is distributed abundantly in temperate zone of *Pauri*, *Tehari*, *Chamoli* and *Uttarkashi* district. The stem bark contains Flavonone, Sakuranetin, Prunatin, Isoflavonone and Padmakstin. It is used in the treatment of stone and gravels in the kidney, bleeding disorders, burning sensation and skin disease. It is a best anti-abortifacient. The stem in combination with other drugs is prescribed for snake bite and scorpion stings. The native of the Punjab believes the fruits to be useful as an ascaricide. In Indo-china the bark is used in dropsy. The flowers are considered diuretic and laxative. The seeds are used as antihelmintic. In China and Malaya peach kernel are given for cough, blood disease and rheumatism. *Padmaka* (*Prunus cerasoides*), is an *Ayurvedic* herb used for the treatment of skin diseases, increases the complexion. The leaf extract of *Prunus cerasoides* used in prostate and urinary disorder. This article is compilation of different aspects of *Prunus cerasoides* and other *Prunus* species such as their botanical classification, morphological features, chemical constituents, pharmacological properties and ethno-medicinal uses.

*Address for correspondence

Dr Chityanand Tiwari

M.D. Scholar,

Department of Dravyagun,

Rishikul Campus Uttarakhand

Ayurved University Dehradun,

Email:

chityanand.tiwari@gmail.com

Contact No-9532185797

INTRODUCTION

Herbal drugs have become the main subject of attention and global importance since a decade. They are said to possess medicinal, therapeutical and economical implications. The regular and widespread use of the herbal drugs is getting popular in the present era creating new horizons. *Prunus* is a large genus of deciduous or evergreen trees and shrubs, distributed chiefly in the temperate regions of the northern hemisphere belonging to the Family Rosaceae. A large number of them are valued as ornamentals on account of their showery flowers^[1]. It is a sacred plant in Hindu tradition. It is beneficial in many ailments such as leprosy, leucoderma, erysipelas, burnings, asthma etc. Locally it is known as, *Panyyan*.

As winter starts restricted patches in the hilly region impart a spring look due to this plant. It blooms in October and lasts up to mid December. Its pinkish-white flowers are the rich source of nectar and pollen for bees. In this period the swarms off honeybee can be observe gathering nectar and pollen heavily from these tree. In *Garhwal Himalaya*, November and December is a period when flowering is minimum, only few wild and ornamental herbs bloom which hardly fulfil the need of honeybee. Thus beekeepers are compelled to use artificial feeding to bees^[2]. Hence *Prunus cerasoides* can

serve as a bloom for beekeepers. In this way artificial feeding is not necessary for those beekeepers whose colonies are in the surrounding of *Prunus cerasoides*.

Taxonomical Classification^[3]

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Rosales
Family	Rosaceae
Genus	<i>Prunus</i>
Species	<i>Prunus puddam</i>

Vernacular name^[4]

Language	Names
English	Himalayan wild cherry, Bird cherry
Hindi	<i>Padmakasha</i> , <i>Puddum</i> , <i>Phaya</i> , <i>Padmakha</i> , <i>Paja</i> , <i>Paya</i> , <i>Phaja</i>
Bengali	<i>Padmak</i> , <i>Padmakashtha</i>
Gujrati	<i>Padmaka thi</i> , <i>Padmaka nu lakadu</i> , <i>Padmakashtha</i> , <i>Padmak</i>
Kannnda	<i>Padamaka</i>
Marathi	<i>Padmaka stha</i> , <i>Padmaka</i> , <i>Padmakasta</i>
Punjabi	<i>Paja</i> , <i>Chabheearae</i> , <i>Amalguckr</i> , <i>Chamiari</i> , <i>Puddum</i>

Part(s) used^[5]: Bark, stem, seed, heart wood.

Classical Review

Caraka Samhita- In *Vednasthapna, Varnya, and Kasaya skandha*^[6]

Susruta Samhita- In *Sarivadia*^[7]

Vagbhata - In *Padmakadi*^[8]

Adarsh nighantu- In *Padmkadi verga*^[9]

Bhavaprakash nighantu- In *Karpuradi verga*^[10]

Kaiyedeve nighantu- In *Aushahdi varg*^[11]

Madanpal nighantu- In *Karpuradi varg*^[12]

Priya nighantu- In *Haritkyadi varg*^[13]

Sodhal nighantu- In *Chandanadi varg*^[14]

Chemical constituents:

Heartwood: Dihydrotecto-chrysin, dihydrowogonin, pinocembrin, chrysin, naringenin, kaempferol, aromadendrin, quercetin, taxifolin, 7-hydroxy-5, 2', 4'-trimethoxy flavanone (Carasinone), 2'-hydroxy 2, 4, 4', 6'-tetramethoxy chalcone (Carasidin), 2',4' dihydroxy-2, 4, 6'- trimethoxy-chalcone (carasin)^[15].

Stem: Naringenin, apigenin, β -sitosterol, sakuranetin, prunetin, genkwanin.

Sapwood: A flavone glycoside puddumin A [7-O-(β -D-glucopyranosyl)-5-O-methylnaringenin], genistein, prunetin, n-pentacosane, triacontane, noctacosanol, β -sitosterol, ursolic acid, oleic, palmitic and stearic acids, afzelin, kaempferitrin, naringenin, β -sitosterol- β -D-glucoside^[16].

Stem bark: Padmakastein and its derivatives, β -sitosterol behenate, tecto-chrysin, genistein, leucocynidin, 4'- glucoside of genkwanin, chrysophenol, emodin, 8 β -D glucosides, orientalone, physcion, β - sitosterol glucoside, amygdalin, prunasetin (isoflavone), sakuranetin, puddumetin, flavanone, sakuranetin (5, 4'- dihydroxy-7-methoxy flavone) and its 5-glucoside, neosakuranin (2, 4'-dihydroxy-4-methoxy-6- glucosidoxo chalcone), leucocyanidin puddumin B (naringenin-4'-methyl ether-7-O- β -D-galactoside), Taxifolin^[17].

Root bark: Ursolic acid, stigmaterol, prunetinoside, glucogenkwanin^[18].

Seed: Naringenin-5-O- α -L-rhamnopyranoside, 4'-O-methyl-liquiritigenin-7-O- α -L rhamnopyranoside, naringenin 4'-methylether 7-xyloside, β - sitosterol-3-O-D-galactopyranoside^[19].

Branches-These are substitute for Hydrocyanic acid, amygdalin.

Leaves: Quercetin-3-rhamnoglucoside, kaempferol

Ayurvedic Properties^[20]

Ras- Kashaya, Tikta

Guna- Laghu, Snigdha

Virya - Seeta

Vipaka- Kattu

Karma- Kapha-pittahara, Garbhasthapana, Vedna sthapana, Vrisya, Varnya

Important Formulation of Padamak^[21]

Chandanadi tail, Mahabhringraj tail, Jatyadi tail, Bala tail,

Botanical Description: A middle sized or a large tree, bark smooth, brown, peeling off in horizontal strips exposing a shining copper colored surface.

Sapwood- Whitish and lustrous.

Heart Wood- Reddish brown, closely grained, moderately hard and strong, durable and seasons well. It is resistant to fungus and insect attack and works to good finish.^[22]

Leaves - Membranous, ovate- lanceolate or elliptic-lanceolate, blade 7.5-12.5 cm, glossy, nearly glabrous, margin sharply serrate, with one or more conspicuous glands on the petiole. Stipules long, 3-5 parted, glandular, and fringed.

Flowers- White, pink or crimson 2.5 cm in diameter in umbellate fascicles, peduncles and are the rich sources of nectar and pollen for bees.

Drapes-Ovoid, oblong or ellipsoid, 1.25-2 cm long, obtuse at both ends, yellow or reddish.

Stone - Rugose, pony, ovoid, wrinkled and furrowed, pulp very little.^[23]

Flowering and Fruiting: October - May

Morphology of Different Species of Prunus^[24]

Prunus amygdalus : A middle sized tree, leaves greyish when full grown, oblong lanceolate, petiole equal to or longer than the greatest width of leaf, Stipules fimbriate. Flowers white, tinged with red, appearing before the leaves from scaly buds on last year wood pericarp dry, when ripe separating in to 2 valves, stone compressed with shallow wrinkles and minute holes.

Prunus persica : A large deciduous shrub or small tree twigs glabrous, leaves conduplicate in bud, 6.3-10 cm long, lanceolate, ovate -lanceolate or lanceolate-oblong, acuminate, usually hairy on the midrib beneath when young serrate, petiole shorter than the greatest width of the leaf glandular or not, stipule subulate, fimbriate, flowers pink, usually before, some time with the leaves, sessile or shortly pedicelled mostly solitary on the previous year wood. Calyx-tube campanulate, 3.8 mm long. Stamens inserted at the mouth of the calyx tube. Ovary and style hairy.

Prunus armeniaca - A medium sized deciduous tree, twigs glabrous, leaves convolute in bud 3.5 -5 by 3.8-5 cm, broadly ovate, flowers pinkish at first then white, appearing before the leaves, solitary or fascicled, pedicel very short, Calyx tube campanulate, puberulous, 5mm long, ovary and base of style hairy, drupe downy or glabrous, yellow tinged with red, stone smooth with a thickened sulcate margin.

Prunus cerasus - A deciduous shrub or small producing numerous root suckers, leaves conduplicate in bud, rather firm, shining, obovate acuminate, serrate, glands usually on the margin on the blade close to the insertion of the petiole, flowers in fascicles of 2-5 on slender pedicels 2.4 cm, long flowers beds usually producing a few leaves before the flowers, calyx lobe usually toothed, corolla white or pink, fruit globose, light red to nearly black acid or sweet.

Prunus avium - Very similar to *Prunus cerasus* Linn but larger and produces no root suckers, leaves flaccid, more coarsely serrate, petiole with 2 glands near the top, flowers bud not bearing leaves but with rather larger reflexed bud scales, calyx lobe usually entire, fruits nearly black, sweet on peduncles up to 5 cm long.

Prunus cerasoides - A middle sized or large tree, bark peeling off in horizontal stripes, wood pale red, leaves glossy nearly glabrous, ovate, long acuminate, sharply serrate, blade 7.5-12.5cm, petiole 1.3 cm. long, stipule pinnately or palmately divided, the division linear, glandular fimbriate. Flowers white, pink or crimson appearing before the leaves, in umbellate fascicles, approximate near the end of branch, pedicels slender, as long as or longer than the calyx, calyx turbinate, lobes ovate, lobe ovate, acute, fruit yellow and red, ovoid or globose, 1.3-2 cm long.

Prunus communis- A shrub or middle sized tree, unarmed or spinescent young shoot pubescent, leaves ovate or ovate or lanceolate, serrate more or less pubescent beneath along the nerve, petiole shorter than the greatest breadth of leaf, stipules linear fimbriate, pedicels slender 3 or 4 time the length of calyx, solitary or fasciculate from lateral often leaf bearing buds, calyx tube campanulate the fruits is sub acrid, cold and moist.

Prunus domestica - A tree unarmed, branches glabrous, pedicle in pairs, pubescent, drupe large, oblong, drooping.

Prunus insititia - A shrub with straight branches, sometime spinescent, branch less velvety, leaves pubescent beneath, pedicels in pairs, downy, drupes middle sized, globose, 1.8-2.5 cm diameter, the fruit is of 5 kind.

Prunus cornuta - A middle sized deciduous tree, twigs glabrous or very finely pubescent, leaves conduplicate in bud 10-15 cm long, oblong lanceolate, petiole 2.5-3.8 cm long red usually with pairs glands near the top, stipule 1.3-2cm long linear fimbriate, flower white in terminal or axillary drooping racemes 10-15 cm long, calyx tube hemispheric, lobe small, round, toothed, petal 3.8 mm long, orbicular, concave, ovary and style glabrous.

Prunus mahaleb - Shrub, very much branched, branches erect, spreading leaves somewhat long ovate, sub rounded ovate, shortly acuminate, often subcordate, obtusely serrate, flower forming simple convex corymbs, white fruit small, ovate often mucronate.

Prunus undulate - A middle sized deciduous tree with rounded crown attaining 1.8 m, girth and 15 m height, bark rough, dark grey or blackish, often with conspicuous raised circular lenticels and exfoliating in small woody scale, blade 1.3 cm, leaves 7.5 -11.5 by 2.5 - 4.5 cm. oblong or elliptic usually widening upwards, acuminate, base rounded, closely and shallowly apiculate crenate, glabrous except for tufts of hairs, petiole 7.5 - 13mm, flowers 7.5-10 mm., diameter, pedicels 2.5-3.8mm. drupe ovoid, 5mm long seated on the persistent calyx red becoming black when ripe.

Prunus triflora- A small bushy tree, all part glabrous, bark smooth blackish, leaves obversely lanceolate, 2-

glandular at the acuminate base, on a slender petiole about 1.3 cm long shortly acuminate, minutely crenulate, 5-5.7 cm long flowers rather small white on slender glabrous pedicels 1.3 cm long, petal 8 mm long, broadly oboval, very shortly clawed, drupes cordate ovoid, the size of a plum dark purple, pruinose, grooved on the one side the pulp pale reddish yellow.

According To Classical Treaties^[25]

1. Cough: *Padmakadi leha*. (CS. Ci.18.173-74)
2. *Vatarakta*: *Padmaka-taila*, *Mahapadmaka-tail*. (CS.Ci.29.110-14)
3. Intrinsic haemorrhage- It is one of the important drug used in the disease.(CS.Ci.4.73-77)
4. Hiccough and asthma- Smoking should be used of *Guggulu* or realgar, or gum-resin of *Shallaki*, *Guggulu*, *Aguru* and *Padamak* mixed with profuse ghee. (AH.Ci.4.14)

Medicinal Uses of *Prunus cerasoides* and its Different Species

Prunus cerasoides - The stem is bitter, acrid, antipyretic, refrigerant, vulnerary causes flatulence, cures leprosy, hallucinations, burning of the body, leucoderma, erysipelas. Useful in vomiting thirst asthma etc^[26]. It is used in vitiated condition of *Pitta*, burning sensation, sprains neuralgia, wound, ulcer, skin decolouration, pruritis, diarrhea^[27].

Prunus amygdalus- The oil is laxative, aphrodisiac and cure headache, burning sensation. The juice of almond mixed with sugar is used in cough. Almond mixed with figs are used as a laxative and to relieve pain in the bowels^[28].

Pharmacological action- seeds exhibits the hypoglycemic activity in albino rat (Teotia and Sing 1997) Almond lowers the post prandial glycemia insulinemia and oxidative stress (Jenkins et al 2006). It has beneficial effect on serum lipid in healthy adult (Love joy et al 2002) and help anti obesity activity (Wein. et al 2003). The oil is sweet, cooling, antispasmodic, sedative, laxative, vulnerary and rejuvenating, used in hepatopathy^[29].

Prunus persica- The leaves are anthelmintic, insecticidal, vermifugal used in leucoderma and in piles. The fruits is given as a demulcent, an antiscorbutic and a stomachic^[30]. The ethanolic extract of the flowers of *Prunus persica* (KU-35) was found to inhibit UVB-as well as UVC induced DNA damage measured by COMET assay in the skin fibroblast cell. KU 35 extract may be useful for protecting the UV induced DNA damage and carcinogenic and applied topically. Laxative effect of leaves of *Prunus persica* are reported in traditional system of medicine may be partially due to cholinergic action (aqueous extract)^[31].

Prunus armeniaca- The fruit is sweet, anti-diarrhoeal, antipyretic, emetic. The seed are tonic and anthelmintic used in diseased of liver, piles and deafness^[32].

Kernels extracted during preparation of dry apricots are used for extraction of a fatty oil used for cooking, in pharmaceutical and cosmetic industry and for

burning. Kernel of some variety are sweet and eaten like almonds^[33].

Prunus cerasus Linn- The fruit is sour and sweetish, stomachic, purgative tonic to the brain, seed is used in gonorrhoea, chronic bronchitis, cure scabies^[34].

Sour cherries also used in preparation of liqueurs. Bark used for allaying heart palpitation, also used in diarrhoea. Infusion of leaves is given to children to cure convulsion. Kernels used as a nervine tonic^[35].

Prunus avium Linn- In European herbal medicine, cherry stems have been used for their diuretic and astringent property. They have been prescribed for cystitis, nephritis, urinary retention and for arthritic problem^[36].

Prunus communis - The fruit used in digestive and aperients useful in biliousness and heat of the body^[37].

Prunus insititia- The unripe fruit is cardiotoxic, stomachic, removes *Kapha* and biliousness and cures urinary discharges. The leaves purify the blood, stop nasal haemorrhage, inflammation of the palate^[38].

Prunus domestica - The fruits are sweet, laxative, refrigerant, appetizing, stomachic, digestive and tonic. They are use in vitiated condition of *Pitta*, nausea, flatulence, colic, dyspepsia and debility^[39].

CONCLUSION

Now a days deforestation remains the most serious environmental problem causing floods and drought, biodiversity loss and worsening rural poverty. Above discussion shows that *Prunus cerasoides* and their species have been identified as an excellent "alignment tree species for reconstituting evergreen forest in regionally dry tropical forestland. *Prunus cerasoides* paste applied externally used as refrigerant, anti- pruritis and complexion enhance. Used internally act as an appetite stimulant, analgesic, cardiotoxic, aphrodisiac, antidesmatosis. It is also useful in bleeding, breathlessness, abortion etc. It kernel is used in urinary calculi. Its other species also having medicinal properties used as laxative, stomach ache, diuretic. They are highly potent in leucoderma, whooping cough, irregular menstruation and debility following miscarriage. Hence step should be taken for their conservation so that forest can remain evergreen for a longer time with achieving all medicinal purpose for society.

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