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Medicinal and Nutritional Aspect of Genus *Prunus* L. with Phytoetymology

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Abstract
Prunus L. is a genus belongs to deciduous, evergreen trees and shrubs native to the temperate regions of the Northern Hemisphere, with around 343 species worldwide. Hooker discovered 19 *Prunus* species in India, ranging in altitude from 760 to 4000 metres. Many wild species fruits are high in vitamins and minerals, and local residents gather them from their natural habitats to meet their daily nutritional needs. Jam, jelly, alcoholic beverages, and fruit juice are all made of fruit pulp from edible species. The kernels of some species produce edible and industrial oils, while others provide high-quality timber and medicines. The authors of this study about the genus *Prunus* choose five nutritional and four medicinal *Prunus* species and found that *Prunus dulcis* (Mill.) D.A.Webb having the highest concentrations of protein (21.2g), carbohydrates (21.6g), and dietary fiber (12.5g) respectively. *Prunus cerasoides* Buch.-Ham. ex D.Don has also been reported to have high medicinal properties. Since this plant component contains numerous phytochemical such as flavones and isoflavones, flavones Glycoside, with this its berries, including stem, roots, heartwood, and fruit are all used as therapeutic agents. Other *Prunus* species contain important phytochemicals as well, but due to lack of research in the area of other species, data on the rest of the species is missing. As a result, it is important to explore this research gap, which will support a wide variety of research fields.

Keywords: *Prunus* L., Medicinal, Nutritional, Phytoetymology

Introduction
Genus *Prunus* belongs to the family Rosaceae and the subfamily Prunea, and it consists of about 343 species which is distributed among five sub-genera, namely, *Padus*, *Amygdalis*, *Cerasus*, *Prunophora* and *Laurocerasus* of deciduous, evergreen trees and shrubs growing chiefly in the temperate, regions of the Northern hemisphere[21]. Hooker reported 19 species in the genus *Prunus* L. from India. Since then the distribution and variation in this genus in India have been systematically worked out by several taxonomists. Out of these, 18 species are mainly under cultivation for edible fruits and kernels and for ornamental purposes and 18 species occur as wild economic types. This genus inhabits the hilly and cold temperate to sub-montane climatic regions of the country on altitude range between 760 and 4000 m. However, commercial cultivation is confined to three northern hilly states viz. Jammu and Kashmir, Himachal Pradesh and Uttaranchal [13, 26, 27]. The fruits of many wild species are good source of vitamins and minerals and gathered from their natural habitats by local inhabitants to fulfill their day-to-day nutritional requirement [6, 16, 28]. Fruit pulp of edible species is commonly used to prepare jam, jelly, alcoholic beverage and fruit juice. Several species yield edible and industrial oils from the kernel; others are a source of high-class timber and medicines [20]. According to Poonam, *et al*. [21] about nineteen *Prunus* species grow wildly in India in the Himalayan regions, majority of these species are of considerable horticultural importance. A number of them are in cultivation for their edible seeds and edible fruits, particularly *P. amygdalis* (Almond), *P. domestica* L. (Plum), *P. persica* (L.) Batsch (Peach), *P. cerasus* L. (Cherry), *P. americana* Marshall (Apricot), etc. A large number of these species are also valued for their ornamental qualities on account of their showy flowers. The woods of many *Prunus* species are used for various purposes, *e.g.* wood of *P. avium* (L.) L. is used in making highclass furniture, the wood of *P. puddum* Roxb. ex Wall. is used in making walking sticks and umbrella crooks, the heartwood of *P. domestica* L. finds use in cabinet work, inlay and turnings, and that of *P. amygdalus* in turnery and marquetry. Besides these, the heartwoods of some species, *e.g.* those of *P. puddum* Roxb. ex Wall and *P. persica* (L.) Batsch are quite hard and strong and are used in the construction of buildings as they are resistant to fungal attack and work to a good finish. Quite a few of these species find applications for their medicinal values, example - *P. spinosa* L., *P. avium* (L.).,

P. cerasus L., *P. cerasoides* Buch.-Ham. ex D.Don etc.
Phytoetymology is the study of plant etymology with true meaning and origin of the word Prunus species Phytoetymolgy (Table 1) indicate that it is derived from Latin or Greek word or resembling with Genus; It enhance our understanding about plant [4]. Ayurveda and Sanskrit name date back to modern literature, so that here mention the vernacular name (Table 4) of Prunus Plant [3].

Botanical Description
Prunus L.: Sp. Pl.: 473 (1753); Gen. Pl. ed. 5: 213 (1754).
Trees or shrubs, sometimes spiny. Leaves simple, entire or serrate with (2-4) glands at the base or on petiole, stipules deciduous, rarely persistent. Flowers solitary, in fascicles or racemes, usually bisexual. Calyx tube obconic or campanulate, calyx lobes 5 or 6, rarely 4 or more, deciduous. Petals 5 or 6, rarely 4 or more, sometimes hardly different from sepals, white or pink. Stamens are 10 to 35. Carpel single, rarely 2 or more, free, enclosed by the calyx tube. Ovary superior ovules 2, styles terminal. Fruit drupe, mesocarp dry or fleshy, endocarp bony or woody. Seeds without endosperm. Presence of a pair of glands (sometimes 1 or 3) near the summit of the petiole or toward the base of the blade is the useful vegetative feature of Genus *Prunus* L. These glands are obscure or absent in certain *Prunus* species, and they cannot differentiate *Prunus* from other genera, such as Salix, where some species may have similar glands. *Prunus* L. is an easily recognisable genus of flower and fruit, with a deep perigynous cup and a drupe with a single large stone or pit enclosing the seed [24].

Fig 1: Flower and Fruit of *Prunus domestica* L.

Table 1: Phytoetymology of *Prunus* species**.**

Botanical Name	Phytoetymology of species.	Citation
Prunus L.	Derived from Latin name *prunus* for the plum tree, Greek word *proumne* means 'the plum tree', *proumnon* means 'plum'	[11, 22], [34]
Prunus cerasoides Buch.-Ham. ex D.Don	Resembling the genus ***Cerasus***.	[7, 11]
Prunus spinosa L.	Derived from Latin word *spinosa* means 'spiny, with spines, prickly'.	[11]
Prunus avium (L.)	Derived from Latin word *avium* means 'of the birds'.	[11]
Prunus cerasus L.	Derived from Latin word *cerasus* means 'cherry-like'; referring to a cherry.	[34]
Prunus dulcis (Mill.)	Derived from Latin word *dulcis* means 'sweet or tender or pleasant'.	[7, 11, 17]
Prunus persica (L.)	Name given on the basis of Persia (Iran).	[17]
Prunus domestica L.	Derived from Latin word *domestica* means 'of the household, domesticated, cultivated'.	[11, 34]
Prunus armeniaca Marshall	Derived from Latin word *armeniaca* means 'of Armenian origin', Greek word *armeniaca* means 'apple from Armenia'.	[34, 32]

Nutritional value
Authors of this manuscript focus on the concentration of proteins, carbohydrates, and fibers in selected species and found that the *Prunus dulcis* (Mill.) has maximum concentration of proteins, carbohydrates and Fibers (Table 2) and that is 21.2g, 21.6g, 12.5g per 100g. concentration of these nutrients is also discussed among other species and found *Prunus persica* (L.) has protein (0.00602g), carbohydrates (0.09228g), Fibers (0.0199g) and *Prunus domestica* L. has protein (0.038g), carbohydrates (0.5421g), Fibers (0.0279g) this shows that the *Prunus persica* (L.) and *Prunus domestica* L. has less amount of nutrients content as compared to *Prunus dulcis* (Mill.)[5]. if we dicussed about *Prunus avium* (L.). and *Prunus armeniaca* Marshall, protein and fiber concentration is less but concentration of carbohydrates is higher as compared to *Prunus persica* (L.) and *Prunus domestica* L. The above study exhibits that *Prunus dulcis* (Mill.) is good source of nutrients as compared to other discussed species and *Prunus avium* L., *Prunus armeniaca* Marshall are good source of carbohydrates (Table 2 and Table 5).

Table 2: Nutritional values of *Prunus* species.

Botanical Name	Common Name (English, Hindi,	Part of Plant Used	Nutrients (per 100 g).	Citation
Prunus dulcis (Mill.)	Almond, Badam	Fruit	Proteins (21.2g), Carbohydrates (21.6g), Dietary fiber (12.5g).	[10, 18]
Prunus persica (L.)	Peach, Adoo	Fruit	Potassium (35mg), fiber (0.0199g), Crude protein (0.00602g), Carbohydrates (0.09228g).	[10, 1]
Prunus domestica L.	Plum, Alu-Bukhara,	Fruit	Protein (0.038g), Dietary fiber (0.0279g), Carbohydrates (0.5421g).	[10, 19]
Prunus avium L.	Sweet Cherry, cherry, Aaluvaal	Fruit	Protein (1.06g), Dietary fiber (2.100g), Carbohydrates (16.01g).	[10, 29, 30]
Prunus armeniaca Marshall	Apricot, Khubani	Fruit	Proteins (0.08g), Carbohydrates (11.2g). Crude fiber (0.115g), Crude fat (0.02g), Total minerals (0.04g), Vitamins (vitamin A, C, K and B complex).	[8, 10, 9, 32, 34, 30]

Medicinal properties

Prunus species consists of numerous phytochemicals like flavonoids, steroids etc.

Flavonoids - Flavonoids are a type of secondary metabolite found in plants. These compound derived from either 2-phenylbenzopyrone or 3-phenylbenzopyrone moiety. Antioxidant properties are the most well known property of flavonoids. According to Poonam, *et al*.,[21] flavonoids consist of 8 major subgroups: chalcone, flavone, flavonol, flavanone, flavonol, anthocyanins, proanthocyanidins and isoflavonoids (Table 3).

Steroids - A steroid is an organic compound of four rings arranged in a specific molecular configuration that is biologically active. Steroids are essential components of cell membranes that affect membrane fluidity and functions as signaling molecules. In this manuscript authors try to go through various flavonoids and steroids present in *Prunus* species which is responsible for its medicinal properties and therapeutic actions (Table 3).

Table 3: Medicinal properties of *Prunus* species

Botanical Name	Common Name (English, Hindi)	Part of Plant Used	Pytochemicals	Therapeutic Properties	Citation
Prunus cerasoides Buch.-Ham. ex D.Don	Wild Himalayan Cherry, Padam	Stem, branches, heartwood and fruit.	Flavones glucoside, narigenin, apigenin, β-sitosterol, sakuranetin, prunetin, genkwanin, n-pentacosane, triacontane, noctacosanol, β-sitosterol, ursolic acid, oleic, palmitic and stearic acids, afzelin, kaempteritrin, naringenin	Diuretic, depurative, anti-abortifacient, antipyretic and refrigerant, astringent, anti-inflammatory	[15, 10]
Prunus spinosa L.	Blackthorn, Krishan kantak	leaves and flowers	Prunin or Naringenin 7-O- β –D glucopyranoside, Kaempferitrin or Kaempfertrin or Kaempferol-3,7-dirhamnopyranoside, Quercitrin or Quercetin 3-*O*- β –L rhamnopyranoside, Quercetin or Quercetol	lithotriptic and diuretic, and given to the people those suffering from peptic ulcer	[21, 25]
Prunus avium (L.)	Sweet Cherry, cherry, Aaluvaal	stems	Aequinoctin or chrysin-7-glucoside, Chrysin, Dihydrotectochrysin, Eriodictyol, Naringenin, Pinocembrin or Dihydrochrysin, Pinostrobin, Salipurposide, Sakuranetin, Kaempferol	useful in treat certain heart diseases	[21, 10]
Prunus cerasus L.	sour cherry, Aluvalu	stems	Aequinoctin or chrysin-7-glucoside, 6,7-Dimethoxy-5,8,4'-trihydroxyflavone, Glucogenkwanin or Genkwanin-5-glucoside, Tectochrysin 5-glucoside, Cerasinone, Naringenin, Pinocembrin or Dihydrochrysin, Pinostrobin 5-β -D-glucoside, Sakuranetin, Sakuranin	useful in treating certain heart diseases	[21, 33]

Table 4: Sanskrit names of *Prunus* species.

Botanical Name	Sanskrit Name	Citation
Prunus dulcis (Mill.)	Vatamam	[10]
Prunus persica (L.)	Apdishati	[31]
Prunus domestica L.	alunk	[12]
Prunus avium L.	Elavaluka	[2]
Prunus armeniaca Marshall	urumana	[10]
Prunus cerasoides Buch.-Ham. ex D.Don	Charu	[10]
Prunus spinosa L.	----	---
Prunus cerasus L.	Elavaluka	[33]

Table 5: Nutrient content of *Prunus* species.

	Protein	Carbohydrate	Fiber
Prunus dulcis (Mill.)	21.2	21.6	12.5
Prunus persica (L.)	0.00602	0.09228	0.0199
Prunus domestica L.	0.038	0.5421	0.0279
Prunus avium L.	1.06	16.01	2.1
Prunus armeniaca Marshall	0.08	11.2	0.115

Table 6: IUCN Status of *Prunus* species

Plant species	IUCN Status
Prunus dulcis (Mill.)	No record
Prunus persica (L.)	No record
Prunus domestica L.	Data deficient
Prunus avium L.	Least concern
Prunus armeniaca Marshall	Data deficient
Prunus cerasoides Buch.-Ham. ex D.Don	No record
Prunus spinosa L.	Least concern
Prunus cerasus L.	Least concern

Result and discussion

Genus *Prunus* L. categories into Sub genera *Amygdales* which include Peaches and Almond, sub Genera *Cerasus* consist Cherries and sub Genera *Prunophora* have Plum and Apricots. There seed and fruit are edible. In this study authors compile and collate information regarding genus *Prunus* L. and selected five nutritional and four medicinal *Prunus* species out of which *Prunus dulcis* (Mill.) has maximum concentration of Proteins (21.2g), Carbohydrates (21.6g), Dietary fiber (12.5g) respectively. In the same way high medicinal properties reported in *Prunus cerasoides* Buch.-Ham. ex D. Don. its stem, branches, heartwood, fruit all are used as therapeutic agent because this plant part consists of various phytochemicals like flavones and isoflavones, flavones glucoside. Other species of *Prunus* also consists essential phytochemicals but due discontinuity of research in field of other species there is disability of data regarding rest of species. Thus, it is mandatory to fill this research gap that will be helpful in furtherance of so many research areas. As per table 6, the conservation status of selected *Prunus* species indicate Least concern by International Union of Conservation of nature and Natural Resources (IUCN) [14].

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