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## A Review and Therapeutic Potentialities of *Picchilataru* - *Persea Macrantha* (Nees) Kosterm. - A Medicinal Plant

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### ABSTRACT

**Introduction:** Ayurveda opines everything in the universe is medicinal, emphasizes on utility of local flora in treatment. This led to introduction of several new drugs into Ayurveda materia medica. *Persea macrantha* (Nees) Kosterm belonging to the family Lauraceae, is endemic to Western Ghats. The leaf as well as bark are used extensively by folklore practitioners in treating various ailments such as rheumatism, asthma, ulcer, bruise, mental upset, fractures, swellings, weakness and debility. The references about this drug are not given in samhita or nighantus of Ayurveda and not considered as a controversial source plant for any of the drug. **Methodology:** The historical review was carried out by collecting the relevant material from *Vedas*, *Samhitas*, and *Nighantus* and also the information about the mentioning of the drug in recent day are reviewed from relevant textbooks, journals. **Results:** The drug is not considered as a source for any of the drug mentioned in *Samhita* or *Nighantus*. Newly coined Sanskrit name was *Picchilataru* and various therapeutic applications are mentioned in detail in various ethno-medico-botanical surveys which are published. **Conclusion:** The leaf and bark of *Persea macrantha* (Nees) Kosterm are highly medicinal. It can be easily cultivated, simple, safe, cost-effective and potent medicine in treating rheumatism, fracture, asthma and ulcer.

### KEYWORDS

*Ayurveda, Endemic, Ethno-medico-botanical surveys, Picchilataru, Rheumatism*



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## INTRODUCTION

The foot prints of usage of plants as a source of medicine can be traced from the pre-vedic period itself. The art and science of medicine further developed in the Vedic period, where in the names and usage of 289 plants were described. This knowledge found its highest growth in the *Samhita* period, as the observations and studies were conducted in a more analytical manner by organizing this knowledge system called Ayurveda. The total number of medicinal plants mentioned in *brihatrayees* viz., *Charaka samhita*, *Sushruta samhita* and *Astanga hridaya* have been estimated around 1900, out of which 670 are common to all three *samhita granthas*. Further, the *nighantukaras* added around 400 new medicinal plants in Ayurvedic materia medica<sup>1</sup>. Though the details pertaining to medicinal plants mentioned in *samhita granthas* are limited compared to that of *nighantus*, *samhitas* always believed and promoted that every plant is medicinal<sup>2</sup> and the protocol of adding a drug into Ayurveda materia medica is elaborated by quoting about collection of the information about medicinal plants from various sources, with names, forms as well as various therapeutic uses of the plant<sup>3</sup>.

As the time passed the knowledge was disseminated to the general population and

more over the common people indigenously developed their own way of treating the disease based on principles of Ayurveda by using flora in and around the vicinity of their practice. The advent of many countries to India probably led to introduction of various exotic plants into Indian Flora. This led to introduction of several new drugs into Ayurveda materia medica too.

Indian subcontinent comprises of around 57,000 plant species and among them around 8000 are mentioned to possess medicinal uses. Western Ghats is one among the four hotspots of Biodiversity found in India. A large number of traditional healers are dependent on this rich source and are making use of the plants for treating various disease conditions successfully. Traditional medicines are used by about 80% of the world population. *Persea macrantha* (Nees) Kosterm. belonging to the family Lauraceae is one such medicinal plant which is endemic to Western Ghats. The leaf as well as bark are used extensively by folklore practitioners in treating various ailments like Rheumatism, Fracture and Asthma<sup>4-6</sup>. They say the tree has lots of sliminess and because of that it is useful in various diseases.

## MATERIALS AND METHODS

**Source of data:** The literary review was carried out by referring *samhitas* like

*Bruhatrayis* and *Laghutrayis*. The information about the mentioning of the drug was also checked from Nighantus like *Dhanvanthari nighantu*, *Bhavaprakasha nighantu*, *Raja nighantu*, *Nighantu adarsha*, *Kaiyadeva nighantu* and *Priya nighantu*. For the exact identification and botanical description various floras were referred. For collecting the information regarding its medicinal properties relevant textbooks, various publications and journals were referred.

## RESULTS

The drug is not mentioned in samhitas nor considered as a source for any of the drug mentioned in *Samhita* or *Nighantus*. Hence the newly coined Sanskrit name was *Picchilataru*. The vernacular names are as mentioned in Table 1.

**Table 1** Vernacular names of *Persea macrantha* (Nees) Kosterm.

Language	Name(s)
Sanskrit	<i>Picchilataru</i> (Newly coined)
Kannada	<i>Gulimavu / Gulmavu / Gulamavu / Seeme maavu / Kurma</i>
Tulu	<i>Nirkukku</i>
English	Ladder tree/ <i>Machilus</i> / Large flowered bay tree
Telugu	<i>Naara</i>
Tamil	<i>Kollamavu</i>
Marathi	<i>Golum</i>
Malayalam	<i>Kulamavu / Kulirmavu</i>
Coorg	<i>Kruramavu</i>

**Botanical information:** *Persea macrantha* (Nees) Kosterm. Synonym *Machilus*

*macrantha* Kosterm belonging to the family Lauraceae<sup>7</sup>. The Taxonomical position is mentioned in Table 2.

**Table 2** Taxonomical position of *Persea macrantha* (Nees) Kosterm.

Kingdom	Plantae
Sub-kingdom	Viridiaeplantae
Phylum	Tracheophyta
Sub-phylum	Spermatophytina
Infra-phylum	Angiospermae
Class	Magnoliopsida
Sub-class	Magnoliidae
Super-order	Lauranae
Order	Lurales
Sub-order	Laurineae
Family	Lauraceae
Genus	<i>Persea</i>
Species	<i>P. macrantha</i> (Nees) Kosterm.
Synonym	<i>Machilus macrantha</i> Nees

The plant was first described by scientist, Nees Von Esenbeck (1776-1858) as *Machilus macrantha* Nees and later Indonesian Botanist, Kostermans (1907-1994) described and merged it under the genus *Persea* of Lauraceae family and hence called it as *Persea macrantha* (Nees) Kosterm. which was published in Reinwardtia journal in 1962.

The meaning of *Persea* is sacred fruit-bearing tree of Egypt and Persia, a genus of trees native to Persia and *macrantha* is made up of two words macro i.e. large and antha is anther. The detailed Botanical Description are available in Flora of South Kanara<sup>8</sup> and Forest Flora of the Bombay Presidency and Sind<sup>9</sup>. The Photographs are displayed in Figure 1.



**Fig 1** The Habit, Leaf, Flower and Fruit of *Persea macrantha* (Nees) Kosterm.

**Family characters- Lauraceae<sup>8,9</sup>:**—The family contains trees, shrubs or parasitic leafless twining herbs. Leaves alternate or whorled, rarely opposite, simple, entire, gland-dotted, estipulate. Flowers small, regular, unisexual or bisexual, monoecious or dioecious, in axillary cymes, panicles or racemes; bracts deciduous or 0, sometimes involucrate. Perianth-tube short, often accrescent in fruit; lobes 4-6 or 0, in two rows, imbricate. Stamens 6-12 or more, arranged in 2-4 whorls, some often reduced to staminodes; anthers 2-4 celled, opening by valvular lids. Ovary superior, sessile,

unilocular with solitary pendulous ovule; style short; stigma discoid or 3-fid. Fruit is berry or drupe, naked or enclosed in the perianth-tube or supported by the more or less enlarged perianth-tube and lobes. Seed solitary; embryo large; endosperm lacking.

**Genus characters— *Persea*<sup>8,9</sup>:** The key for identification of genera *Persea* is – Fruiting pedicel cylindrical, not enlarged nor fleshy. Evergreen trees, leaves alternate, penninerved. Flowers small, bisexual, in panicles from upper axils; bracts caduceous. Perianth-tube short; lobes 6. Fertile stamens 9, in 3 whorls, usually with long filaments;

anthers 4-celled, those of outer 2 whorls introrse, inner whorl extrorse and provided with usually stipitate basal glands; fourth whorl of staminodes cordate-stipulate. Ovary ovoid; style slender, stigma discoid. Fruit a berry, seated on the scarcely enlarged perianth; perianth-lobes reflexed under fruit or none.

**Species characters<sup>8,9</sup>:** The key for identification of *P. macrantha* species is – Panicles diffuse; berry globose, less than 3cm wide.

**Habitat and Distribution<sup>4,9</sup>:** Found frequently in forests of Western Ghats of India and Sri Lanka. Commonly found in Karnataka, Bihar, Kerala, Maharashtra and the Deccan peninsula up to an altitude of 2100m.

**Habit/Morphology<sup>8,9</sup>:** It is a large evergreen tree, growing up to 30m in height, 3m in girth, with a cylindrical bole upto 7.5m long.

**Leaves<sup>8,9</sup>:** Simple, Alternate arrangement, clustered at the ends of branches, coriaceous measuring 9-18 X 2.8-6.3cm, entire margin, variable in shape from oblong to elliptic-lanceolate and Acute at both the ends, glabrous above and glaucous beneath, finely reticulate venation, petioles 2-3.2cm long. **Bark<sup>9</sup>:** 20-25mm thick, surface pale brown, mottled with dark blotches, scurfy and thinly scaly, rough, exfoliations small, brittle. **Flowers<sup>8,9</sup>:**

Numerous, small, hermaphrodites, in axillary panicles, greenish-yellow coloured, perianth-tube short or obsolete, segments 6, sub-equal, persistent, reflexed in fruit, stamens 9 perfect, those of the 2 outer rows with glandular hairy filaments and 4-celled anthers. Ovary sessile, narrowed into the style, stigma is discoid.

**Fruits<sup>8,9</sup>:** A globose or ovoid berry, seated on the persistent perianth measuring 1.3-2cm in diameter, smooth, dark green coloured dotted with white, ultimately becoming dark. **Seeds<sup>8,9</sup>:** Single, small, round seeded, within the testa.

**Phenology<sup>8</sup>:** Flowering time is between December to April, Fruit maturation March to April.

**Chemical composition<sup>4,5,7</sup>:** It contains alkaloids, steroids, carbohydrates, tannins, flavonoids, saponins, terpenoid, phenols and carboxylic acid. The major alkaloid reported is Machiline from root, Macranthine, Norligans and B-sitosterol in leaf and bark, an uncrystallized base Machiline hydrochloride and Arabinoxylon from the bark.

**Toxicity data<sup>10</sup>:** Acute oral toxicity study (LD<sub>50</sub>) of *P. macrantha* Syn. *Machilus macrantha* is estimated as more than 2000mg/kg.

**Pharmacological activities:** The drug is proven for various activities such as Analgesic activity<sup>11</sup>, Anti-inflammatory

activity<sup>10,11,18</sup>, Anti-arthritis activity<sup>10</sup>, Hypotensive activity<sup>11</sup>, Anti-bacterial activity<sup>12</sup>, Anti-histaminic activity<sup>10,11</sup>, Anti-anaphylactic activity<sup>13</sup>, Wound healing activity<sup>14</sup>, Anti-oxidant activity<sup>15</sup>, Cytoprotective activity<sup>15</sup>, Radical scavenging activity<sup>16</sup>.

#### **Folklore / Indigenous medicinal uses<sup>4-7,</sup>**

**18:** As per the various Ethno-medico-botanical surveys following are the therapeutic uses of *Persea macrantha* (Nees) Kosterm. The Mucilage of the Bark is used as a shampoo due to its cooling effect, bark powder is used for mental upset, bark decoction is recommended for rheumatism and asthma, Bark or leaf paste is applied for all types of Joint pains, Bark decoction is poured as *Dhara* for swellings, Bark paste with mustard seeds is applied externally for bruises, Leaves are used externally to treat ulcers, Leaf and Bark are used to treat Fractures, Leaf and Bark are used in treatment of weakness and debility.

**Clinical trial report<sup>18:</sup>** 30 patients diagnosed as *Sandhigata vata* w.s.r. to Osteoarthritis of knee were selected for the Clinical trial and intervened with leaf of *P. macrantha* tablet and External application together. It is found beneficial in reducing the symptoms such as pain, crepitus, restricted movements, swelling, time taken in minutes to walk 30 meters, time taken in minutes to do 10 sit-ups, time taken in

minutes to climb 10 steps, WOMAC score, Oswestry functional disability score and increase in range of movement. The Leaf was found to be safe and effective drug in the management of sandhigata vata.

**Economical uses<sup>19:</sup>** Crushed bark extract is mixed with paint or cement for better binding<sup>6</sup>, Bark mucilage is smeared over earthen pot to harden it, Commercially its bark is used in the preparation of incense-stick, match boxes and ornamental things etc, Bark is used in Carving, furniture, light construction, joinery, veneer and plywood, musical instruments, The tree is a shade bearer which is used as an canopy, The wood is durable and timber is of high economic value, It is used in making ladder, boat, house building as planks, flooring and ceiling boards, It is suitable for commercial and tea chest plywood, cabinet panels, slate frames, the mucilage of the leaves and bark is mixed with various natural colours and used as a paint.

**Conservation concern details<sup>20:</sup>** As per the survey conducted on December 1999 by FRLHT, Bengaluru the conservation status of *Persea macrantha* (Nees) Kosterm. in Karnataka it is endangered, in Kerala it is Vulnerable and in Tamil Nadu it is critically endangered.

**Cultivation and Propagation:** This is rarely cultivated but seen naturally in forests of Western Ghats. The propagation

time is monsoon, through Seeds which retain their viability for only about 12 months, starts sprouting when it comes in contact with rain water in rainy season.

## DISCUSSION

Ayurveda is the oldest yet scientific system of medicine, considers every substance is medicinal in nature. Highlights about the utility of locally available plants in treatment, thus suggests to compile the medicinal uses of plants by observing birds, animals and also from ajapa (Shepherds), gopa (Cowherds) and other people who live in forest. Tribal people live in harmony with the nature thus having close link between man and the environment. Each and every tribal/ethnic community has its own system of medicine for which they utilize locally available natural plant based resources around their vicinity for their daily use as custom and also for various medicinal purposes. This knowledge of usage of plants was handed down orally from one generation to the next. In Indian subcontinent majority of people are living in rural parts, traditional medicines will take care of their healthcare needs, as they strongly believe the folklore healers. Lack of primary healthcare centres also makes them to approach traditional healers. Besides, medicinal plants which are used by

the folklore practitioners are easily available natural plant based products, which are cost-effective with no side-effects or negligible sometimes<sup>21</sup>.

There is insignificant difference between Ayurveda as well as the Folklore practices except the fact that Ayurveda is documented and folklore practices are spread through tradition from the ancestors. The Documentation of knowledge about medicinally important plant species were done in the study. Thus it is evident that the knowledge of the folklore practitioners is in depth, undoubted and very much scientific. Thus it is need of the hour to document such traditional medicinal practices which is of use to present as well as future generations. The ethno-medico-botanical study of *Persea macrantha* (Nees) Kosterm revealed that the drug is used extensively in treatment of various ailments like joint pain, fracture, ulcer, mental ailments. The plant possesses alkaloid, steroid, tannins, flavonoids, saponins, terpenoids, phenols and carboxylic acid<sup>18</sup>. Alkaloids evoke bitter taste, narcotic thus used as muscle relaxant and to relieve pain as it is having analgesic property. Plants steroids are anti-inflammatory in nature due to this it is helpful in reducing the pain also they are anabolic in nature thus promote bone density and muscle growth. Tannins are astringent, dry and gives pucker feeling in



the mouth they are used as healing agents in inflammation. The presence of flavonoids implies that it may have anti-inflammatory, antioxidant, anti-cancer activity. Saponins may enhance nutrient absorption and aid indigestion. Terpenoids are used extensively for their aromatic assets which are also believed to be as precursors of sterols and steroids. Presence of the above phytochemicals along with its safety data justifies its therapeutic value as to be a better wound healing, analgesic, anti-inflammatory, anti-arthritic, anti-bacterial and anti-oxidant drug as the action of the drug is directly dependent on its chemical composition.

## CONCLUSION

Ayurveda believes every plant is medicinal and hence there is no limit to study and use those plants as per the guidelines of Ayurveda which is the need of the present era to avoid burden on vulnerable or endangered plant species mentioned in Ayurveda due to their over exploitation as there is high demand for raw materials. The leaf and bark of *Persea macrantha* (Nees) Kosterm. are highly medicinal. It can be easily cultivated, simple, safe, cost-effective and potent medicine in treating rheumatism, fracture, asthma and ulcer. As it is safe for human consumption, with this

sufficient data the drug can be taken up for studying it as per guidelines of Ayurveda like assessment of its *rasa panchaka* and further for clinical studies in various diseases to rationally include it into Ayurveda materia medica, thus providing a scientific and evidence based documentation of traditional knowledge as mentioned in Ayurveda.

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