A SURVEY ON PONGAMIA *PINNATA* (KARANJ) WITH TRADITIONAL, ECONOMICAL, MEDICINAL USE

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ABSTRACT: In this paper we represent a brief survey about a plant named *pongamia pinnata* which is also called *Karanj*. This paper consist of the different kind of names of Karanj plant. We mainly focus on the traditional use of *pongamia pinnata* with all its part, also focuses on its medicinal and economical value. We have seen nature has been an excellent source of medicinal medicine for many years and an astonishing number of modern medicines have been extracted from natural sources, many are based on their use in traditional medicine. Pongamia pinnata is known for its healing properties. The various parts of this plant are traditionally used to treat various ailments inclusive of bronchitis, cough, rheumatism, diarrhea, gonorrhea and leprosy.

Keywords: *Pongamia Pinnata, Traditional Medicine, Morphology, Distribution.*

1. INTRODUCTION

Pongamia *pinnata* L. (Pierre), better known as Karanj, is one of the most productive trees in the Fabaceae family. The evergreen tree native to the Western Ghats but is still distributed throughout India and extends eastward, especially in the sub-regions of South-East Asia and Australia (Anonymous, 1953). It is a nitrogen fixation and drought tolerant species that thrives under a variety of climatic and edaphic conditions. P. pinnata is an important source of fuel, fodder and small firewood in rural India. However, it has an economic value for its seeds, which provide an important commercial oil, commonly known as pongam oil for use in the tanning, pharmaceutical and soap industries (Karoshi & Hegde, 2002). The oil is also used in lighting and as a lubricant. It has low viscosity and excellent fuel-efficient properties similar to petro-diesel. Therefore, much emphasis has been placed on recent years to explore the potential of pongam oil as another source of petro-diesel in India.

Demand for petrol and diesel is increasing rapidly in developing countries. The rate of increase is very high in India. Consumption was 37 million tons in 1970, which increased to 222.79 million metric tonnes by 2020-2021

Most Tamil Nadu doctors of the Indian traditional medicine system Ayurveda and siddha use Pongamia pinnata to treat a variety of ailments including diabetes mellitus. The 'Pongam Tree' is grown in large numbers of gardens and on countless roads in India and is becoming one of the city's most revered trees. The tree is known for its many benefits and as a potential source of biodiesel4. The seeds are reported to contain an average of about 28-34% of the oil with a high percentage of polyunsaturated fatty acids. Historically pongamia has been used as a herbal medicine, especially in Ayurveda and in the garden of the Indian medicine system6. Every part of the plant has been used as an herbal medicine in the treatment of tissues, scars, skin diseases, itching, painful wounds in the bones, ulcers, diarrhea etc. It is known for its use as animal fodder, raw manure, timber and fish toxins. There has been a lot of agricultural use and environmental management, with pesticide and matricidal activities, more recently, the activity of P. pinnata as a source of biomedicine has been reported8 mainly as antimicrobial and therapeutic

It grows wild in coastal forests throughout India and along streams and rivers. The ‘Pongam Tree’ is a medium-growing tree that grows rapidly. It contains ugly brownish-brown bark. Fresh leaves bloom and the flower blooms in large numbers almost simultaneously on this tree. They remain hidden in the middle of the leaves. The flowers are 1.3cm tall and grow on the edges of long stems. These plants come from the upper part of the leaves. The flowers have a stem of the minute. They are loose and brown and carry a cup-shaped calyx. There are five white spaces and these are followed by pink or purple 3. The fruit of the ‘Pongam Tree’ are some of the bugs that grow like tall trees. They are gray in color and ripen just before the new leaves emerge. Each seed of the tree is covered with a hard shell. The raft looks like a rubber boat. The ground beneath the tree is often covered with cracked carpet. The leaves of the ‘Pongam Tree’ have five, seven, or nine oval leaflets that have had 4 tips.

The leaves are around 15 cm to 30 cm long and each of the leaflets is shortened. The leaf stems and flower stems are often proud of their foundations. It is one of the few 'Nitrogen Fixing Trees' trees that produces seeds containing 30-40% oil. The current review may be helpful on the bridge between traditional claims and modern medicine in Pongamia pinnata.

2. BOTANICAL NAME

Pongamia pinnata (L.) Pierre

3. TRADITIONAL NAMES:

Sanskrit: Ghrtakarauja, Karanjaka, Naktahva, Naktamala

Bengali: Dahara karanja, Karanja, Natakaranja

Assamese: Korach

Kannada: Honge, Hulagilu

Marathi: Karanja

Gujrati: Kanaji, Kanajo

Punjabi: Karanj

Telugu: Ganuga, Kanugu

Hindi: Karuaini, Dithouri

Oriya: Karanja

Tamil: Pungai, Pongana

Urdu: Karanj

Malayalam: Pungu, Ungu, Unu, Avittal

Botanical Classification

Empire: Plantae

Classification: Magnoliophyta

Class: Magnoliopsida

Order: Fabales

Family: Leguminoseae

Type: Pongamia

Genres: Pinnata

4. DISTRIBUTION:

Areas of Pongamia pinnata is India. Distribution in foreign regions are Bangladesh, Myanmar, Nepal, Thailand, Australia, China, Egypt, Fiji, Indonesia, Japan, Malaysia, Mauritius, New Zeeland, Pakistan, Philippines, Seychelles, Solomon Islands, Sri Lanka, Sudan, United States of America. (Orwa et al. 2009).

5. MORPHOLOGICAL DESCRIPTION

The morphological description of pongamia pinnata with it's part i.e root, leaf, bark, pod, stem, seed contains its size, behaviour, colour along with figures.

Morphological Description		
Plant part	**Taxonomy Description**	**Figure**
Root	Advanced, thick, well developed, and lateral roots	
Bark	Bark is of gravish brown color	
Leaf	approx 3 inches hairless alternate leaves arrangement	
Flower	aprox 16 mm, 2-4 bunch, pink white color, P shaped	
Pod	approx 5 cm long and 3 cm wide, smoothy, greenish brown color, 2 seeds in a pod	
Seed	approx 13 cm , dark brown color, ovoid or kidney like structure	

Table 1. Morphological description of Pongamia pinnata

6. TRADITIONAL USE

i. Root

Pongamia pinnata is good for cleansing wounds, brushing teeth, tightening gums and gonorrhea. Root paste is used for the local system for vigorous growth.

ii. Stem

Liquid extraction of stem bark demonstrates important CNS sedative and antipyretic activity (Philip and Sharma, 1997).

iii. Leaf

Pongamia pinnata leaves are digestive, stomach, antihelmintic and are suitable for diarrhea, leprosy, dyspepsia and cough. The flowers are useful in relieving dipsia with diabetes and reducing vata and kapha.

iv. Fruits

Pongamia pinnata fruit used in traditional herbal remedies.

v. Seeds

Karanja seeds are used as a medicinal plant, especially in the Ayurvedic and sedha system of Indian medicine. Seeds are antihelmintic, bitter, acrid, haematinic and carminative. They are useful for infections, chronic fever, anemia and hemorrhoids

vi. Oil

The oil is antihelmintic, styptic and is recommended for opthalmia, leprosy, ulcers, herpes and lumbago. Its oil is a source of biodiesel.

vii. Bark

The new bark of Pongamia pinnata is sweet and has a mucilaginous taste, soon to be bitter and acrid. Antihelmintic and useful in beri-beri, ophthalmology, dermatopathy, vaginopathy, used internally for mass bleeding, diabetes and ulcers.

viii. Flower

The flowers are limited to glycosuria and as a remedy for diabetes

7. ECONOMIC USE

i. Root

used as a fish poisoning (Oommen et al., 2000).

ii. Stem

- High fuel consumption of stoves, poles and decorative engraving (Das and Alam, 2001).

-Ash of wood used for dyeing (Allen and Allen, 1981).

-Making a cabinet, cart wheels, posts (NAS, 1980).

-Agricultural resources, tool handles and cakes (GOI, 1983).

iii. The leaf

-It is used as feed for cattle. (Ambasta et al., 1992).

-Used on stored seeds to repel insects.

-Use as rice manure (Dastur, 1968) and sugarcane fields (Drury,

1978).

iv. Fruits

Fruits are edible (Singh et al., 1983).

v. Seeds

-After the extraction of oil it is used as "raw manure" as it is rich in protein and nitrogen.

- Used as a pesticide (APROSC, 1991).

vi. Oil

-Used as cooking oil and lamps, as lubricants, water-repellent, pesticide and soap making, candles and tanning industry (Burkill, 1966).

-Used as lipids commercial processes.

Used in cosmatic

vii. Bark

-The wire and cord can be made from bark fiber.

-Used for rolling paper

viii. Flower

-Good sources of bee pollen (Lakshmi et al., 1997).

-The flowers are eaten (Bhattacharjee, 2001).

8. MEDICATION USE

i. Root

- Root juice of coconut milk and lime juice used for the treatment of gonorrhea (Jos, 2006 and Manandhar, 2002).

- Used to clean gums, teeth and ulcers (Bhattacharjee, 1998).

- The roots are anti-helmintic and are used in genital and skin diseases (Gills et al., 1998).

- Root juice is used to clean dirty wounds and close fake wounds (Gon, 2007).

ii. Stem

Liquid extraction of stem bark demonstrates important CNS sedative and antipyretic activity (Philip and Sharma, 1997).

iii. The leaf

-The leaf juice is used for colds, coughs, diarrhea, dyspepsia, constipation, gonorrhea, leprosy (Ambasta et al., 1992; Oommen, et al., 2000. and Bhattacharjee, 2001).

-The leaves are antihelminthitic, digestive and laxative used for inflammation, bumps and wounds.

-As a remedy for rheumatism.

- As an ingredient in the treatment of itching and herpes.

iii. Fruits

-Fruits used for abdominal tissues (Hartwell, 1967-1971).

- It is useful for diseases of the vagina, leprosy, tumor, lice, ulcers

and upper abdominal airway (Rastogi and

Mehrotra, 1960-1969).

iv. Seeds

-It is used for body tissues.

-Using high blood pressure, skin diseases and arthritis (Ballal, 2005; Tanaka et al., 1992; Carcache et al., 2003).

Valuable powder used such as febrifuge, tonic and bronchitis and cough (CSIR, 1948-1998).

-Used in rebellion, pectoral diseases, chronic colds, hemorrhoids and anemia (Warrier et al., 1995).

v. Oil

-Oil is styptic, anthelmintic, and good in leprosy, piles, ulcers, chronic fever and liver pain (Warrier et al., 1995).

-Uffective in rheumatism arthritis scabies (Prasad and Reshmi, 2003) cough (CSIR, 1948-98).

-A combination of oils and zinc oxide used for eczema.

vii. Bark

-Lots of bleeding, of beriberi, reduce inflammation of the spleen (Kirtikar, 1984).

-It is useful for mental disorders, coughs and colds (Manandhar, 2002).

viii. Flower

It is helpful in eliminating dipsia in diabetes (Joshi, 2006,; Bhattacharjee, 2001 and Brijesh et al., 2006), in reducing vata and kapha (Manandhar, 2002) and excessive bleeding (Baral and Kurmi, 2006).

8. PONGAMIA PINNATA- AS A SOURCE OF BIODIESEL

Biodiesel is growing rapidly due to increased demand, needed policy support and access to technology. India consumes about 40 million tons of biodiesel and is ranked fifth in the world after U S, China, Russia and Japan in terms of fuel consumption. Recently, the Government of India launched the "National Mission on Bio-diesel" in a review to find cheap and renewable fuel based on vegetable oil. Biodiesel fuel can be described as medium-length chains (C16 ± C18) of fatty acids and contains mainly mono-alkyl fatty acid esters. It has the benefits of non-toxic, decaying and non-sulfur and carcinogenic ring (Yamane et al. 2001).

Pongamia pinnata is known for its various benefits and as a potential source of biodiesel (Naik et al. 2008). Considered "Biodiesel" as many parameters of diesel and Pongamia pinnata oil are compared (Gerphen et al. 2004; Shaine et al. 2004)

CONCLUSION:

Extensive literature research reveals that PongamiaPinnata L. is an important medicinal plant with a wide variety of crops. This plant shows the existence of many chemical elements that are responsible for a variety of medicinal, economical and traditional uses. In addition, it also represents a milestone in the oil industry as one of the most important bio fuel crops. However, testing needs to be done in Pongamia Pinnata L. to assess hidden areas and their effective use of clinics, which can be used for human well-being.

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