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Chapter- 7

Ethno-medicinal properties of some selected holy plants of West Bengal, India

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Abstract:

Worship of nature has been an integral part of human culture. The different religious communities of India have worshipped many plants since time immemorial. Our ancient scriptures have also enlisted the names of many plants which hold religious importance. These plants are considered very precious gifts to mankind. Some of these sacred plants include neem, mango, babool, turmeric, night flowering jasmine, lotus, tulsi, doob grass, etc. Many of these plants or their parts are used for their medicinal properties. Different parts of these plants, like flowers, fruits, seeds, leaves, barks and roots, are used to treat several types of health-related issues like cough and cold, anxiety, oral problems, digestive disorders, cardiovascular problems, skin ailments and various other health issues. These plants contain various bioactive compounds, which generally play vital roles in reducing the physical manifestations of those diseases and may help to control them. Still, we lack detailed information and knowledge about the medicinal benefits of those holy plants in order to pave the way to establish them as commercial medicine, so that one can obtain the advantages from them. It can be revealed only through proper studies and experimental research.

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Introduction:

India is the second largest country in the world in terms of population and seventh largest in terms of area. India is known for its rich diversity in geographical landscapes, climatic conditions, culture and traditions of people, languages, food and religious beliefs. Different religious communities have different ways of worship. India is also rich in floral and faunal diversity. The Botanical Survey of India has described over 46,000 species of plants and over 1.03 lakh species of fauna have been described by the Zoological Survey of India. Many of the plant species are considered sacred among different religious sects and are worshipped as a part of their tradition. Common plants considered sacred include tulsi, turmeric, mango, banyan, peepal, bael, kadambh, neem, lotus, etc. These plants are often believed to be incarnations of God and Goddess. Many sacred rituals are considered to be incomplete without the use of these sacred plants (Pandey and Pandey, 2016). A wide range of these plants also has other benefits. Some of them have ornamental flowers used for decoration during different festivals while many are used in the preparation of essential oil. Some plants like neem, turmeric and tulsi act as insecticides (Sarkar, 2017). Many of these plants have been used as ethno-medicine for years (Sarkar et al., 2016; Bhattacharjee, 2021). The Unnani, Ayurveda and Tibbia have enlisted around 2000 different species of plants which are considered beneficial to humans (Gadgil and Varkala, 1976). For a long time, indigenous people have used different parts of these plants like their flowers, seeds, stems, leaves, roots etc., for their medicinal advantages (Maiti et al., 2010; Maiti et a., 2013; Acharya, 2016; Sarkar, 2016; Sanyal et al., 2017). These properties generally include analgesic, anti-diabetic, antimicrobial, antiseptic, anti-inflammatory and many other activities that greatly benefit human health (Erfani, 2021; Kar et al., 2022). Proper studies on the medicinal advantages of these plants can reveal more unknown beneficial properties and help us learn their mode of action better (Banerjee et al., 2014; Sanyal et al., 2016). Some common holy plants of the Indian subcontinent and their medicinal values are discussed here.

Practices of medicinal plants in tribal communities:

India consists of half of the tribal population of the total of the world (Prakash, 2015). They are enriched in the knowledge of different medicinal plants and their benefits in regular life to survive in the remote and challenging environment of the different geographic location of India. Their traditional knowledge about the application of medicinal properties of various local plants is the base of various scientific researches in the healthcare system. The greater biodiversity of India also supports this practice. The Indigenous people of India have strong faith on the medicinal plants as a part of their many religious practices. Few medicinal plants like *Ocimum sanctum, Aeglemarmelos, Cedrusdeodara, Musa paradissica, Azadiractha indica, Ficus religiosa* etc are used for common treatments and worship (Prakash, 2015), but different anthropogenic disturbance negatively effects on those communities which lead to diminishing their precious knowledge of medicinal plants. It is important to conserve those biological resources for the greater benefit of mankind.

Azadirachta indica (Neem):

Azadirachta indica is commonly known as Neem in India. It is a large tree of the Lamiaceae family which can grow upto almost 30 meters. This medicinal plant is generally found in the tropical and subtropical regions. It has widespread branches and pinnate leaves which range from medium to dark green in color. The flowers are white and fragrant.

Neem as a holy plant:

This tree is considered sacred and is worshiped in some parts of Odisha and Southern Asia. According to the Hindu mythology, it is believed that neem tree is the reincarnation of Goddess Durga (Sikarwar, 2016).

Bioactive components of Neem:

The neem plant has two main bioactive chemicals. They are Limonoids and Terpene (Ogbewu, 2008). Other bioactive compounds include Nimbin, which has spermicidal activity and Gedunin- which is antimicrobial in action. It also contains certain polysaccharides which show anti-inflammatory activities (Kudoma et al., 2011; Chopra et al., 1958).

Medicinal properties of Neem:

As an immunostimulant:

When the leaves of Neem plant were administered orally for three weeks, it was seen that there was an increase in the amount of IgM and IgG antibodies. The amount of anti-ovalbumin had also increased with the intake of Neem leaves (Kraus, 1995).

Reduction of ulcer:

Neem contains a bioactive compound called glycoside which has antiulcer and antacid properties (Sharma and Saksena, 1959).

Antimicrobial properties:

Neem can prevent the occurrence of fowlpox, chickenpox and smallpox (Bhowmik et al., 2010). It also halts the replication process of Dengue type 2 viruses (Rao et al., 1969). Ethanolic extraction of Neem leaves is effective against *Aspergillus* and *Rhizopus* (Mondali et al., 2009).

As an analgesic:

Oil produced from the seeds of neem plants has been shown to have analgesic properties.

Antimalarial activity:

Spraying purified neem extracts on stagnant water bodies reduces the growth of Plasmodium falciparum larva, the causative agent of the deadliest falciparum malaria (Rojanapo et al., 1985).

Anthelminthic property:

The anthelmintic properties of Neem have been reported repeatedly. It inhibits the larval hatching of *Haemonchus contortus*. Neem extract also possesses anti-filarial activity against bovine filarial parasites *Setaria cervi* (Mukherjee et al., 2018).

Uses of neem as a medicinal plant:

In traditional medicine, almost all parts of the neem plant, including its leaves, flowers, seeds, bark, and stem, have been used (Locke, 1990). Several ways of using different parts of neem plant and their benefits are:

- Oral ingestion of the neem leaves is helpful in purifying blood and in regulating blood glucose levels.
- Chewing neem sticks are considered extremely beneficial for oral hygiene.
- Neem seed oil is helpful in curing several skin infections.
- Neem leaves have also been shown to cure intestinal worm infections and cause other digestive tract infections.
- The application of neem tree bark can prevent the spread of microbial infections on the skin. It has also been shown to have wound-healing properties.
- Neem tree bark is also beneficial for conditions like excessive thirst and nausea.

Ocimum sanctum (Tulsi):

Ocimum sanctum is the scientific name given to Tulsi. The Tulsi plant is also called holy basil. Tulsi plant grows up to 2 meters in length. It has many erect branches and sub-branches. The stems are hairy and the leaves are petiolar and oval-shaped (Warrier 1995). It is distinguished into two types- Rama Tulsi; which has bright green stems and Krishna Tulsi; which has dark reddish purple stems (Staples and Kristianerran, 1999). Tulsi plants grow both in the home (GramyaTulsi) as well as in the forest (VanyaTulsi ; Kumar, 2012).

Tulsi as a holy plant:

The Tulsi plant is considered sacred among the Hindu community and leaves of this plant are used to worship many gods and goddesses (Robinson and Cush, 1997). Some communities also wear the tulsi beads around their neck. In several cultures, tulsi is grown at home in the centre of the lawn and water is offered to the plant regularly.

Bioactive components of Tulsi:

Tulsi leaves contain a volatile oil which has methyl eugenol (20%) and eugenol (71%). The stem of Tulsi plant has phenolic compounds and antioxidants like rosameric acid, apigenin, cirsimaritin, cirsilineol and isothymusin (Yanpallewar et al., 2004).

Medicinal properties of Tulsi plant:

Antimicrobial properties:

The oil from tulsi plants is effective against bacteria like *Pseudomonas* sp. and *Bacillus* sp. Extracts of Tulsi plant can inhibit the growth of *Staphylococcus* sp. and *Proteus* sp. *(*Kumar et al., 2012).

Anti-inflammatory activity:

Extract of methanol prepared from tulsi leaves has anti-inflammatory activity on acute and chronic inflammation (Singh and Majumdar, 1997). It has also shown a reduction in inflammatory symptoms in rats (Singh and Agarwal, 1991).

Anti-diabetic property:

An experiment was carried out in the hyperglycemic rats in which extraction of tulsi plant was administered orally to them. It was found that their glucose levels got restored to normal after continuous administration for several days.

Anthelmintic activity:

Antihelminic efficacy of Tulsi against earthworms has been reported previously by Buchineni et al. (2015). Aqueous extract of leaves of Tulsi causes paralysis and consequent death of earthworms (Buchineni et al., 2015).

Use of Tulsi as medicinal plant:

Tulsi plant is considered of great medicinal value. It is used in the treatment of cough and cold, influenza, bronchitis, asthma and a number of other therapeutic conditions like vomiting, catarrhal fever, diarrhea, dysentery, skin rash, eczema and allergies (Prakash and Gupta, 2005).

- Tulsi plants can give several health benefits. Some of them include treatment for sore throat, kidney stones, coughs and colds, eye problems, oral infections and skin ailments.
- In order to cure sore throat, tulsi leaves are boiled and gargled.
- If tulsi leaf juice is consumed with honey regularly for several months, it can help expel kidney stones through the urinary tract.
- Tulsi leaves are chewed raw in order to provide relief for cough and cold.
- Pouring a few drops of Tulsi oil into the eyes can cure eye problems.
- Chewing a few basil leaves regularly is known to cure oral infections.
- The application of basil leaf paste helps to cure a skin infection.

Circumin sp. (Turmeric):

Turmeric plant is known as *Circumin* sp. in Latin. It belongs to the family Zingiberaceae. It is mainly found in India and some parts of South East Asia (Gupta et al., 2013). It is 3 to 5 feet tall and has yellow-coloured flowers. The rhizome stem is underground. It is thick and fleshy.

Turmeric as a holy plant:

Turmeric plant is worshiped in several parts of India, especially in the states of Bihar and Jharkhand. Young saplings of turmeric plants are immersed in the river water during the festival of Chhath as a part of worship.

Bioactive components of turmeric:

Phytochemicals present in turmeric include Circumin (70-75%), demethoxycircumin (5-10%) and bisdemetoxicicumin (5-10%) (Kocaadam and Sanlier, 2017; Soleimani et al., 2018).

Medicinal properties of turmeric:

Prevention of heart disease:

Adding turmeric to food has decreased bad cholesterol levels, which helps prevent heart disease (Patil et al., 1971).

Effect of turmeric on arthritis:

Using turmeric can provide benefits to patients who have arthritis since it is known to have antioxidant and anti-inflammatory properties.

Anti-carcinogenic properties:

Circumin, the main bioactive turmeric compound, plays an important role in the induction of apoptosis and promotes proper regulation of the cell cycle (Gautam et al., 1998).

Antimicrobial properties:

Aqueous solutions made from the extracts of turmeric have shown to kill bacteria. But these tests are performed only in animals (Kumar et al., 2001).

Anthelmintic property:

Ethanolic extract of *Curcuma longa* was reported for their anthelmintic activity towards third-stage Haemonchus larvae (L3) (Nasai et al., 2016). Rhizome extracts of Curcuma longa act as a biological nematicide against the Indian earthworm *Pheretima posthuma* (Singh et al., 2011).

Use of turmeric as a medicinal plant:

- Uses of turmeric in food as a spice aid in digestion. It also burns low-density lipoproteins and is effective for cardiovascular health.
- Milk mixed with turmeric powder is effective against cough and cold.
- Leaves of turmeric plants are believed to have antiseptic properties. It can also reduce symptoms of jaundice common cold and can also prevent intestinal worm infections.
- The application of turmeric paste to the joint can cause a reduction in joint pain. In addition, turmeric is very effective against microbial infections.

Nyctanthes arbor tristis (Night jasmine):

It is commonly called Parijat or night jasmine. Night jasmine belongs to the family Oleaceae. It grows in deciduous forests and semi-arid regions (Chopra et al., 1956).

Night jasmine as a holy plant:

The flowers of night jasmine are offered to Goddess Durga during Navratri. Hindu scriptures state that Lord Krishna had brought this plant for his wife Satyabhama. This plant is considered the combined form of the five wish-fulfilling plants of Devlok (Mesharan et al., 2012).

Phytochemicals of Night jasmine plant:

Some important phytoconstituents of Night jasmine include voatie oil, carotene, lupeol, fructose, benzoic acid, carotenoid, glycosides, alpha-carotene, oleic acid, lignoceric acid, palmitic acid, myristic acid, alkaloids etc.

Medicinal properties of night jasmine:

Antimalarial activity:

A test was carried out on one hundred and twenty patients who were infected by the malarial parasite, *Plasmodium vivax*. In this experiment, the paste made from five medium sized leaves was administered three times daily for seven to ten days. It was seen that ninety patients got cured within seven days, while the rest of the patients recovered within ten days (Shah and Verma, 2012).

Anti-anemic property:

The extracts obtained from different parts (flowers, leaves, barks etc.) of the plant have been shown to increase the haemoglobin count and the number of red blood cells in rats (Jain and Mittal, 2011).

Anti-filarial property:

The flowers of the night jasmine plant can be used to extract a type of chloroform which is capable of killing the mosquito larvae which act as vectors of filaria-causing parasites (Khatune et al., 2001).

Anti-inflammatory properties:

Extracts of night jasmine are rich in flavonoids that cause a reduction in the inflammatory response (Omkar et al., 2006).

Conclusion:

The medicinal values of sacred plants have been known to human knowledge since ancient times. Many indigenous communities of India utilize different parts of these plants regularly to treat certain ailments like cough and cold, skin problems, oral disorders, etc. Plants contain bioactive compounds which play crucial roles in reducing the symptoms of certain diseases and infections. These phytochemicals have lesser side effects compared to the medicines

manufactured by the use of strong synthetic chemicals. So, proper study on the benefits of those medicinal plants can help to establish phytochemical based therapeutics for the treatment of various acute and chronic diseases with lesser side effects in low cost sustainable manner. Some of these plants like neem, babool, turmeric etc. have excellent insecticidal properties. Planting tulsi on the house can prevent mosquitoes from entering the house. Neem also prevents the entry of many harmful and poisonous insects. So extracts from these plants can be used to make plant-based insecticides and mosquito repellents less harmful than synthetic ones. Proper studies and detailed research can reveal much more about the medicinal advantages of holy plants.

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