

# Amlachati Medicinal Garden, Jhargram: Ethnopharmacology in West Bengal

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**ABSTRACT:** The use of plants as medicine is as old as human civilization itself. India is home to about 15000 to 18000 of flowering plants of which about 8000 plant species are recognized as medicinal plants and are being used by various traditional systems of medicine. Ethnopharmacology is a subset of ethnobotany that covers the medicinal uses of plants. The Amlachati Medicinal Plant Garden is an ex-situ conservation site of medicinal plant species of South Bengal under Silviculture division, Jhargram Research Range. It has extensive rose, spice and dye gardens besides a large bambusetum and is an excellent initiative by the Directorate of Forests, Government of West Bengal.

**Keywords:** Ethnopharmacology, medicinal plants, biodiversity conservation, ex-situ conservation

## I. BACKGROUND

During recent years, ethno botanical research on medicinal plants is getting much importance and is now being considered as a thrust area in the field of biological research. India ranks sixth in the world's twelve mega bio-diversity zones. Out of these twelve, two exist in our country. India possesses tremendous ecological biodiversity. It contains 5 % of the world's biodiversity on 2 % of the earth's surface. It is estimated that approximately 45000 plants species i.e. 12 % of global wealth of flowering plants (Jain, 1987) exist, out of which nearly 33% are endemic (Gupta, et. al 2002). The biodiversity in our country is unique in nature and its in situ and ex situ conservation is very well needed. In recent years, the global demand of herbs has led to a quantum jump in volume of medicinal plants traded within and across the countries. The medicinal plants have been identified as the most important plant species for rural development.

In recent years, medicinal plants have also been gaining immense popularity not only in developing countries but also in developed countries due to various reasons like serious side effects of synthetic drugs. Therefore, the demand

for the basic raw material has been further increased and forest areas are hardly able to meet this increasing demand of industries. In view of the aforesaid reasons, there is an urgent need to conserve and propagate some important medicinal plants species so as to save them from extinction and also to ensure greater availability of raw material. Technically, medicinal plants come under non-timber forest products (NTFP) and there is a great potential for probable cultivation of medicinal plants for biodiversity conservation in India. However, their identification, conservation and cultivation for rural development is still in infancy (Mishra, 2002).

## Steps for Conservation and Sustainable use of Medicinal Plants

According to Planning Commission Report (2000) the primary goals of biodiversity conservation as envisaged in World Conservation Strategy are maintaining of essential ecological process and its life support system, preservation of genetic diversity and Sustainable Management (Sen, 2011, 2014a, 2015a, 2018a)

The best way to start and orchestrate such a process is for each country to prepare a national strategy for the conservation and sustainable use of its medicinal plants. The process of preparing a Strategy will help in developing a consensus on what needs to be done, assigning tasks to different institutions, motivating participants to undertake the tasks and monitoring progress.

Each country should identify and support one or more institutions to plan, coordinate and implement ethnobotanical surveys. So far, most ethnobotanical surveys have been carried out by individuals, rather than by institutions. If the useful information of traditional practices is to be documented before it is too late, ethnobotanical activities must be broadened and accelerated. To do this, the primary responsibility should move from the individual researchers to selected institutions, which can then provide the support,

encouragement, coordination and implementation that are needed.

The selected institution(s) should implement nationwide surveys on the use of plants for medicinal purposes in traditional societies. The teams carrying out the surveys should be multi-disciplinary, and should include the traditional practitioners as part of the team. To carry out this guideline, training in ethnobotany will be needed to provide the necessary personnel. It is worth noting that the guideline only covers the use of plants as medicines. Although the term 'ethnobotany' is often used in this context, the correct term is 'ethnopharmacology', which is a subset of ethnobotany that covers the medicinal uses of plants.

It is well known that a lot of emphasis is being given on conservation and cultivation of medicinal plants by Govt. of India. There is urgent need to take up intensive cultivation through people's participation in the forest areas (Sen 2014b, 2015b, 2016) as well as agricultural lands. The medicinal and aromatic crops are economically important as they provide the basic raw materials for pharmaceutical, perfumery, flavor, soaps and cosmetic industries throughout the world. Since most of the crops are new and uncommon, the farmers often lack knowledge in their scientific cultivation. The information on the cultivation of medicinal and aromatic crops is also scanty, scattered and mostly beyond the reach of even progressive farmers.

### The Indian Scenario

The use of plants as medicine is as old as human civilization itself. India is home to about 15000 to 18000 of flowering plants of which about 8000 plant species are recognized as medicinal plants and are being used by various traditional systems of medicine. The global demand for medicine and aromatic plants is growing at the rate of 7% per annum (Rao, et. al 1999).

According to the Botanical Survey of India, India is home to more than 8,000 species of medicinal plants. The country has a rich history of traditional healing systems, many of which list the use of these plants. For instance, the oldest printed book on Indian medicinal plants, Hortus Malabaricus, a 12-volume treatise on the medicinal plants of the Malabar region along India's west coast dates back to 1678.

Even in current times, research on medicinal plants and their use across India documents how local communities, especially indigenous ones, still use them in their daily lives (scroll.in 2020). In the Andaman and Nicobar

Islands, four indigenous communities, including the Jarawas, use 39 endemic medicinal plants for their health needs and 17 of these are used to cure multiple ailments, finds a 2018 study. Of the 83 plant species used by the semi-pastoral Gujjar community in Himachal Pradesh, 32 are used as medicine alone.

However, the indigenous knowledge associated with the conservation and use of medicinal plants is also disappearing at an alarming rate. The fact that medicinal plants could be used as sources of revenue for farmers prompted the Institute of Biodiversity Conservation (IBC) to initiate the development of a project on Conservation and Sustainable Use of Medicinal Plants (CSMPP).

### Initiatives by different States

The State Forest Departments (SFDs) of Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Maharashtra in collaboration with the Foundation for Revitalization of Local Health Traditions (FRLHT) and with the support of DANIDA and UNDP have established more than fifty forest gene bank sites called Medicinal Plant Conservation Areas (MPCA). The network of 54 MPCAs, each measuring 200 ha to 500 ha, has been established gradually since 1993 and represents all forest types with large bio-climatic and soil regime variation. These gene banks harbour 45% of recorded populations of flowering and medicinal plants of Peninsular India, including 70% of the red-listed. The intra-specific diversity or germplasm conserved in the MPCA network can be used to provide authenticated quality planting material for commercial cultivation to meet rising demands of the herbal industry.

MPCAs also constitute 'study sites' for threatened species recovery research. MPCAs have proved crucial in capacity building of forestry staff, local communities and researchers in the conservation of medicinal plants for sustainable use and equitable benefit sharing. This experience can help in implementing plans and programmes under the Biological Diversity Act 2002, National Biodiversity Strategy and Action Plan (NBSAP) and Medicinal Plants Board. Various states have established Medicinal Plant Boards to improve the status of existing medicinal plants in their respective areas either by in situ or ex situ conservation.

The National Medicinal Plant Board lists 72 'medicinal plants' conservation and development areas' covering 10,935 hectares that have been set up across 13 states to conserve medicinal plants in their natural habitats. Under the

Department of Biotechnology, four ‘field gene banks’ of threatened plants, including those known for their medicinal uses, are also being maintained across India.

Additional research on such in vitro methods including the production of secondary metabolites would be crucial for the ‘effective and sustainable use’ of these plants, comment scientists in a review of in vitro technology for the conservation of medicinal plants in the Western Ghats. At MSSRF’s Wayanad centre, ethnobotany – the traditional ways in which communities identify and classify plants – is a study focus. Their six-hectare medicinal plant park developed with the State government in Odisha’s Jeypore functions as a plant genetic repository and field site for nine tribal communities to cultivate and harvest the medicinal plants they have relied on for centuries.

The forest areas in the state of Uttar Pradesh are very rich in variety of medicinal plant species particularly in the Vindhyan region where various medicinal plants grow naturally. The medicinal plants are basic raw material for the

production of Ayurveda and Unani medicine medicines. The bulk of the raw material (about 80% of the demand) is derived from the forests. Hence, the forest areas have been over exploited in the past to meet the requirement of the pharmaceutical and allied industries. Consequently, many of the important plant species have been threatened and some of them are on the verge of extinction due to unscientific collection by untrained persons.

### Amlachati Medicinal Plant Garden, Jhargram, West Bengal

Jhargram is a small town in West Bengal, with a mystical aura, and surrounded by dense forests on all sides. The Amlachati Medicinal Plant Garden is an ex-situ conservation site of medicinal plant species of South Bengal under Silviculture division, Jhargram Research Range. It has extensive rose, spice and dye gardens besides a large bambusetum and is an excellent initiative by the Directorate of Forests, Government of West Bengal.



1. Amlachati Medicinal Plant Garden



2. Layout of the garden



3. Within Amlachati medicinal garden



4. Eucalyptus citriodora



5. Costus igneus



6. Cymbopogon winterianus



(All 8 photographs are taken by the author)

Eucalyptus citriodora (Pic. 4) leaves yield a lemon-scented oil rich in citronellal, and favored in perfumery. The wood is good for saw-timber, used for general construction, poles, railroad ties and tool handles. Bark may contain up to 12% tannin.

Kenyans favor the honey produced by this species. Reported to be antiseptic and fumigant, Cubans place the leaves under the sheets of fever patients, and inhale the steam from boiled leaves for cold and various pulmonary problems. Cubans also poultice the leaves onto ulcers, wounds, and

other skin ailments. Guatemalans decoct the leafy shoots for coughs (Morton, 1981). Orally administered leaf extracts in rabbits artificially diabetic, produced temporary hypoglycemia and reduced the blood sugar levels (Watt and Breyer-Brandwijk, 1962). Myrtillin, in the leaf extract, is said to induce a temporary hypoglycemia (Atal and Kapur, 1981).

An interesting and useful plant found at Amlachati is Costus igneus (Pic. 5), commonly known as insulin plant belonging to the family Costaceae. Consumption of the leaves are believed

to lower blood glucose levels, and diabetics who consumed the leaves of this plant did report a fall in their blood glucose levels (Shetty et al. 2010). Reduction in the fasting and the postprandial blood sugar levels with leaves of insulin plant was comparable with that obtained with Glibenclamide 500 µg/kg at 250 mg/kg/day and 500 mg/kg/day of powdered leaves of the insulin plant (*Costus igeus*).

*Cymbopogon winterianus* (Pic. 6), another member of the Amlachati medicinal garden is a robust, aromatic, evergreen, perennial, clump-forming grass with numerous erect culms arising from a short rhizome. The essential oil is widely used in the perfumery industry. This species yields up to twice as much essential oil as the related *Cymbopogon nardus* (which is grown mainly in Sri Lanka), and the oil is of better quality. Citronellal and trans.-geraniol were dominant in *Cymbopogon winterianus* oil (Simic et al. 2008).

*Ocimum gratissimum* (Pic.7) (Ramtuksi) is grown in the Amlachati medicinal garden for the essential oil that is extracted from its leaves and stems. Eugenol and to a lesser extent thymol extracted from the oil are substitutes for clove oil and thyme oil. The essential oil is also used in perfumery. This species is often planted as ornamental, culinary and medicinal plant. In Asia, a tea is made from the leaves. Leaves are also eaten in salads and used as a condiment for sauces, soups or meat. It is also planted for hedges and as a mosquito repellent.

In India, *O. gratissimum* is widely used in religious ceremonies and rituals. The whole plant and the essential oil have many applications in traditional medicine, especially in Africa and India. Preparations from the whole plant are used as stomachic and in treating sunstroke, headache and influenza. The seeds have laxative properties and the essential oil is used to treat fever, inflammations of the throat, ears or eyes, stomach pain, diarrhoea and skin diseases (PROSEA 2018; PROTA 2018).

Another useful plant found at Amlachati is *Hemigraphis colorata* (Pic. 8) commonly known as Red Ivy. This plant has an incredible potency of wound healing, hence the familiar name 'Murikootti' which is used to treat fresh wounds, cuts, ulcers, inflammation (Silja et al. 2008), internally to cure anaemia (Gledhill 2008), haemorrhoids, diuretic, gallstones and diabetes mellitus (Gayathri et al. 2011). The leaves contain flavonoids, polyphenols, tannins, high potassium and low sodium levels; stem contains saponins and tannins, roots contain flavonoids and polyphenols. The glycosides present in ethanolic extract of the

whole plant are responsible for the antioxidant effect. Phenolic compounds are effective hydrogen donor which makes them a good antioxidant (Akhil and Prabhu, 2013).

## II. CONCLUSION

Amlachati medicinal plant garden has an extensive collection of medicinal plants and is an excellent initiative by the Directorate of Forests, Govt. of West Bengal. A number of academic institutions have also taken up serious plans to cultivate medicinal plants. R.K. Mission, Narendrapur and Asutosh College 2<sup>nd</sup> Campus at Bhasha are a couple of such extremely praiseworthy efforts by the academia to participate in biodiversity conservation and livelihood generation for the economically backward. Such initiatives by different organizations can serve several beneficial purposes including involvement of local communities in conservation, participation and awareness to address the larger goal of ethnopharmacology (Sen 2018b, 2015c, 2014c).

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