

Wetland Plant Therapy: An Alternative Medicine for Traditional Health Care in Odisha, India Taranisen Panda

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Introduction

Wetlands are perhaps the most interesting landscapes in the world to have earned global importance during the last few decades. They are being considered all round the world in the issues of environmental protection, eco-restoration, pollution control, and biodiversity conservation. The values of each wetland are intimately linked with its location and the cultural status and socioeconomic needs of the people who use it. The importance of wetlands to the global carbon cycle, water balance, wildlife, biodiversity, human food and medicine production is much greater than their proportional surface area on earth.

Worldwide, ten thousands of species of higher plants and several hundred lower plants are currently used by human beings for a wide variety of purposes such as food, fuel, fiber, oil, herbs, spices, industrial crops and as forage and fodder for domesticated animals (Heywood 1992). Many Indian plants and their constituents are the chief ingredients of a number of pharmaceutical preparations used in various ailments, on account of their high antibacterial and antimicrobial activities (Kirtikar and Basu 1991). Many plant species, possessing medicinally important compounds are disappearing at an alarming rate due to the destruction of their natural habitats caused by rapid agricultural development, urbanization, indiscriminate deforestation and uncontrolled collection of plant materials.

Odisha, one of the eastern states of India, has one of the oldest and richest cultural traditions of using wetland plants for medicinal purposes. The rural people of the state still depend on the traditional ethnomedicine for their day-to-day primary health care. These medicinal plants gain further importance in the region where modern medical health facilities are either not available or not easily accessible.



Of the pharmacologically active principles found in plant kingdom, terrestrial plants are arguably the most important group. Intensive studies concerning ethnomedicinal uses of terrestrial plants of Odisha has earlier been highlighted (Mudgal and Pal 1980; Saxena et al. 1988; Girach et al. 1998; Nayak et al. 2004; Panda et al. 2005; Pandey and Rout 2006; Rout et al. 2009; Sahoo and Satpathy 2009; Panda 2010). The use of aquatic/wetland plant species as remedies, although representing an important component of traditional medicine has hardly been studied (Panda and Mishra 2011). It is especially true in case of the Kendrapara district with around 642,273 ha of wetlands which is almost 5% of the total state wetland area. Many wetlands including several small and large rivers systems, creeks, numerous natural and man made canals and ponds are distributed in the district. Traditionally the local inhabitants have been using wetland plants against the diseases they suffer from. So an attempt has been made to collect ethnomedicinal information on wetland plants to treat common diseases on the basis of field surveys and taxonomic identification of plants available in Kendrapara district of Odisha, India during 2009-10.

Materials and Methods

Study area

The Kendrapara district (20° 21' - 20° 47' - N and 86° 14' - 87° 03' - E) is located (Figure 1) in the coastal part of Odisha (=Orissa), India. The study was carried out in different villages of the districts during 2009-2010. The villages were selected basing upon the following criteria (i) rural-based having rich wetland biodiversity and (ii) the traditional health system of the people is mostly based on the plants available in the locality. The climate of the district is warm and humid. Three distinct seasons are felt during the year: rainy season (June until October), winter (November until February) and summer (March until June). The annual rainfall varies from 1500 mm to 1550 mm and temperature ranges from 17° to 48°C. Periodic earth tremors, thunder storms and dust storms in April and May are further characteristic features of the districts.

The field study was carried out from August 2009 to September 2010, and information on the use of medicinal plants was obtained through structured questionnaires, complemented by free interviews and informal conversations (Huntington 2000). The interviews were individually carried out and, during the first contacts with the local population, “native specialists” were identified. These were people who consider themselves, and are considered by the community, as having exceptional knowledge about the use of plants. Eighty-seven (68 men and 19 women) people were interviewed. Among these interviewees, 10% were aged 21-40 years, 40% were 61 years old or more and half of the sample (50%) were in the 41-60 age range. Surveys were conducted in different villages of the district.

Medicine men, Kaviraj, experienced and aged persons, local healers of the villages were consulted for recording local name; parts of plants used, methods of drug preparation and recommended doses. Personal interviews



Figure 1: Map of the study site in Odisha, India.

and group discussions with local inhabitants revealed some very valuable and specific information about the plants, which were further authenticated by crosschecking. In addition to crosschecking and recording folk names of plants through collecting voucher specimens, it was important to crosscheck information with different people and compare the results from different methods (Cunningham 2001). Interviews with people out of the village were conducted on a systematic basis to know more details about species, their management and distribution.

The collected specimens were processed, dried and herbarium specimens were prepared. Voucher specimens of the collected plant species were deposited in the herbarium of the Department of Botany, Chandbali College, Chandbali. A voucher specimen facilitated the identification of the species encountered



during the research and permitted colleagues to review the results of the study (Jain and Goel 1995). We consulted several sources for identification of species: Haines (1921-25), Saxena and Brahmam (1994-1996) and Kirtikar and Basu (1991). The medicinal plants collected are listed here with their botanical names followed by family name, their local names in Oriya if any and the parts used for medicinal purpose.

Results

The study revealed that the inhabitants of Kendrapara district have sufficient knowledge about ethnomedicinal uses of wetland plants growing in their surrounding. We found that twenty two plant species comprising eighteen families were used for medicinal purposes in the surveyed area. The most important families were: Amaranthaceae, Araceae, Asteraceae and Nympheaceae. The medicinal parts, leaf, flower, seed, stem, root, rhizome and whole plant were used in raw or processed forms (Table 1). The most cited treated diseases were: cough and cold, cardiovascular, diabetes, epilepsy, fever, gonorrhoea, rheumatism and skin. The data collected show that majority of medicines were taken orally. Some of the reported preparations were drawn from a mixture of plants. The percentage of use of aerial plant parts were higher (80%) than that of underground parts (20%).

Discussion

Nature was man's earliest source of vital medicine which has provided a continuous source of raw materials used for treating all his ailments. In contrast to modern allopathic method, the traditional knowledge which is developed through experience of mankind is potential source for the development of drugs against variety of diseases. The present report on the use of aquatic plants for medicinal purposes draws support from earlier studies in different parts of India (Biswas and Calder 1954; Jain 1965; Majid 1986; Gupta et al. 2005). The studied wetland plants are also reported in different districts of south Odisha (Panda and Mishra 2011). Moreover, these reports differ in the parts of the plant used or in preparation and mode of use (Jain 1991).

The local people inherit rich traditional knowledge about the medicinal uses of flora investigated and apply this knowledge for making crude medicines to cure infections, as well as a number of ailments from simple cold to other complicated diseases. Traditional knowledge forms the basis for origin of not only alternative medicine but also paved way to evolution of a gamut of new and novel modern medicines. This knowledge is mostly unknown to scientific world and faces a slow and natural death.

The catalogued plants in the present study are common in the surveyed area, this way it is evidenced that the flora composition of Kendrapara district influences the choice of medicinal plants use. A similar tendency was reported by Adeola (1992) who observed that the species used for preventive and healing medicine were associated with the natural area in which the users live, as well as with their relative species abundance.

Conclusion

The present study indicates that wetland medicinal plants associated with rivers, ponds and other aqueous systems are unique to the indigenous medicinal knowledge of the locality under study. Plants are still the major source of medicine for a variety of diseases like cardiovascular, bronchitis, skin allergies, and inflammatory conditions to the people in the surveyed area. Considering the importance of plant species in different wetlands, it is concluded that the conversion of natural wetlands to different land uses leads to the loss of many medicinal species. Conservation measures, a proper management and utilization of wetland can ensure maintenance of the biological stability as well as a healthy ecosystem service to the society.

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Voucher No.	Family	Botanical Name, Author and Local name	Parts Used	Disease/ Condition	Mode of Application
KT-41	Acanthaceae	<i>Hygrophila auriculata</i> Schum.Heine, 'Koelikhia'	Leaf	Abdominal pain, urinary infection	Leaf extract is taken orally for abdominal pain and urinary infection. Powdered leaves are taken twice a day for a week against bronchitis and cough
KT-107	Amaranthaceae	<i>Alternanthera philoxeroides</i> Mart. Grises, 'Ghoda madaranga'	Young shoot	Cough	4-5 young shoots are ground with black pepper and taken orally to cure acute cough.
KT-111	Amaranthaceae	<i>Alternanthera sessilis</i> R.Br., 'Madaranga'	Leaf, root	Headache, blood pressure	1-2 tea- spoonful of leaf juice is taken for headache, blood pressure and leucorrhea. Root juice is used as nasal dropper.
KT-84	Amarylladaceae	<i>Crinum latifolium</i> L., Amarylladaceae, 'Pani kenduli'	Root	Night blindness, diabetes	One teaspoonful of root juice is taken before breakfast.
KT-78	Anacardiaceae	<i>Hydrilla verticillata</i> (L.f) Royle, 'Chingudia dala'	Whole plant	Joint pain	Whole plant is slightly warmed and tied on the affected area.
KT-86	Apiaceae	<i>Centella asiatica</i> L.Urban., 'Thalkudi'	Leaf	Indigestion	3-4 fresh leaves are taken in empty stomach early in the morning before breakfast.
KT -17	Araceae	<i>Lasia spinosa</i> (L.) Thw, 'Panisaru'	Stem (modified)	Stomach disorder	The curry of modified stem with curd is useful for digestion and stomach disorder.
KT-13	Araceae	<i>Pistia stratiotes</i> L., 'Borjhanji'	Whole plant	Rheumatism, leprosy, eczema	Whole plant is warmed and tied at the inflamed area to reduce swelling. Leaf juice with coconut oil is used to treat leprosy and eczema.

Table 1: Ethno-medico profile of wetland plants of Kendrapara district

Voucher No.	Family	Botanical Name, Author and Local name	Parts Used	Disease/ Condition	Mode of Application
KT-18	Asteraceae	<i>Enhydra fluctuans</i> Lour., 'Hidmicha'	Leaf	Gonorrhea	Half cup of infusion of leaves is drunk as a remedy against gonorrhea. Leaf paste prepared with castor oil is applied on paining legs. Pure mustard oil mixed with leaves juice is given to cure headache. Leaves juice mixed with honey is given three times a day in cough.
KT-93	Asteraceae	<i>Grangea maderaspatana</i> L.Poir., 'Paijhari'	Leaf	Stomach problem	7-8 young leaves are ground and the extracted juice is taken with sugar.
KT-47	Boraginaceae	<i>Heliotropium indicum</i> L., 'Hatisundha'	Leaf	Insect bites	Fresh leaves are crushed and applied externally for insect bites.
KT-103	Commelinaceae	<i>Commelina benghalensis</i> L., 'Kansiri'	Leaf	Boils	Warm leaf is applied around boils as suppurate.
KT-117	Convolvulaceae	<i>Ipomea aquatica</i> Forssk., 'Kalama'	Leaf	Gonorrhea	Leaf juices along with cow ghee are used for gonorrhea and also act as blood purifier.
KT-129	Cyperaceae	<i>Cyperus rotundus</i> L. 'Mutha'	Rhizome, leaf	Pneumonia	The tuber paste mixed with honey is given internally to heal ulcers. Rhizomes, tender leaves and equal amount of <i>Piper nigrum</i> are made into paste with water to cure pneumonia. One tea spoon of dried rhizome powder is taken every day to cure acidity and other stomach diseases



Voucher No.	Family	Botanical Name, Author and Local name	Parts Used	Disease/ Condition	Mode of Application
KT-54	Fabaceae	<i>Aeschynomene aspera</i> L., 'Solo'	Aerial part	Cough and cold fever	1-2 teaspoonful of young shoot juice is given to cure cough and cold fever.
KT-31	Linaceae	<i>Trapa natans</i> L., 'Pani singada'	Leaf	Rheumatism	Leaf powder is taken orally for rheumatism. Leaf juice is used for stomach disorder.
KT-47	Marsileaceae	<i>Marsilea quadrifolia</i> L., 'Sunsunia'	Leaf	Headache, blood pressure	Leaf extract is taken with sugar for headache and blood pressure.
KT-51	Menyanthaceae	<i>Nymphoides indica</i> Kuntze, 'Panisimili'	Leaf	Epilepsy, rheumatism	Leaf paste is taken orally to cure epilepsy and rheumatism. Plant decoction is drunk to cure fever and dysentery.
KT-66	Molluginaceae	<i>Glinus oppositifolius</i> (L.) A.DC., 'Pitasaga'	Whole plant	Skin	Whole plant is used either in raw or cooked form to cure various types of skin disease like scabies, itches etc.
KT-29	Nympheaceae	<i>Nelumbo nucifera</i> Gaertn., 'Padma'	Flower, seed	Diarrhea	Flower petal decoction is useful for diarrhea. A sweet prepared from its seed floor is given as cardio-tonic after child birth.
KT-48	Nympheaceae	<i>Nymphaea pubescens</i> Wild., 'Dhala kain'	Rhizome	Dysentery	Paste of rhizome is taken in morning to treat dysentery. Seeds are soaked overnight and the water is drunk to cure diarrhea.
KT-16	Scrophulariaceae	<i>Bacopa monnieri</i> L., Pennel, 'Brahmi'	Whole plant	Cardiac, memory power	Leaf paste or juice is taken orally for blood pressure and to increase memory power.

Table 1 cont'd: Ethno-medico profile of wetland plants of Kendrapara district

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