



Ethno-medicinal uses of some threatened medicinal plant species of Mahanadi Wildlife Division, Boudh-Nayagarh district, Odisha, India

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ABSTRACT

Mahanadi Wildlife Division in Odisha harbours diversified vegetation mostly belonging to tropical moist deciduous forests and rich flora including a number of important and threatened medicinal plants. Due to habitat destruction and overexploitation, the wild populations of several medicinal plant species have declined considerably in recent years. In the present communication, first-hand information collected from local inhabitants on ethno-medicinal uses of 18 prioritized threatened medicinal plants of Odisha like *Rauvolfia serpentina*, *Mesua ferrea*, *Oroxylum indicum*, *Gardenia gummifera*, *Gloriosa superba* etc. have been provided. Needs for periodic threat assessment and strategy for conservation of these important species including reintroduction in natural habitats have been emphasized.

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1. Introduction

Plants are universally recognized as a vital part of the world's biological diversity and an essential resource for the planet. Many thousands of wild plants have great economic and cultural importance, providing food, medicine, fuel, clothing and shelter for humans around the world. Plants also play a key role in maintaining the Earth's environmental balance and ecosystem stability. They also provide habitats for the world's animal and insect life. Many plant species are threatened by habitat transformation, over-exploitation, invasive alien species, pollution and climate change and are now in danger of extinction. The disappearance of such vital and large amounts of biodiversity presents one of the greatest challenges for the world community: to halt the destruction of plant diversity that is essential to meet the present and future needs of humankind (Anonymous, 2009).

According to estimates by IUCN, 10% of all plant taxa are under some sort of threat globally. The over exploitation of resources and deforestation in the tropical forests has resulted in depletion of biodiversity. The main threat to tropical biodiversity is habitat loss (Bowels *et al*, 1998). The Red Data Book of Indian Plants (Nayar & Sastry, 1987, 1988, 1990) listed only 814 species of threatened plants (4.7%) under different categories out of the known 17000-18000 species of flowering plants in the country. It is essential to develop species-specific conservation strategies for the RET species with emphasis on both *in situ* and *ex situ* conservation approaches. The conservation, domestication and sustainable utilization of threatened medicinal plants assume great importance in view of their utility as a healthcare need for the vast majority of tribal and rural population in a country like India.

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The use of a large variety of plants in Odisha to cure diseases is an age-old practice for people living in forest and rural areas, where they lack access to modern medical facilities, and do not have the capacity to afford for modern allopathic drugs. The forest has been the source of medicinal plants since man became aware of the preventive and curative properties of plants and started using them for human health care. Medicinal plants have traditionally occupied an important position in the socio-cultural, spiritual, and health care of rural and tribal people in the state.

The Conservation Assessment and Management Prioritization (CAMP) workshop for medicinal plants of Odisha was held in October 2007 at Bhubaneswar came out with a prioritized list of 41 species of medicinal plants those require conservation intervention (Ved *et al.*, 2008). The objective of the workshop was to assess the threat on medicinal plants of Odisha, based on the criteria developed by the International Union for Conservation of Nature and Natural Resources (IUCN). During a CAMP process, the wild and captive status for each taxon under consideration was reviewed with emphasis on distribution and habitat, population characteristics, level of present and perceptible threat, biology of the species etc. and based on these criteria each species was assigned a IUCN Red list category.

In the present study, the ethno-medicinal uses of 18 of the 41 prioritized medicinal plant species used by the tribal and local people in and around Mahanadi Wildlife Division, Boudh and Nayagarh districts of Odisha have been collected and presented in this paper.

2. Study area

The Mahanadi Wildlife Division was created by inclusion of a part of Satkosia (WL) sanctuary situated south of the river Mahanadi in Boudh and Nayagarh district and Baisipalli (WL) sanctuary in Nayagarh district in the year 1999. The Division is located between 20° 23.8' to 20° 36.8' N Latitude and 84° 35.4' to 84° 58.5' E Longitude (Fig.1). The total geographical area of Mahanadi Wildlife Division is 437.29 Sq. Kms which includes the whole area of Baisipalli Wildlife Sanctuary (168.35 Sq. Km.) and part of Satakosia Gorge Sanctuary (268.94 Sq. Km.). It consists of four Reserve Forests viz. Padmatola RF and Arakhpadar RF in Boudh District, Mahanadi RF and Baisipalli RF in Nayagarh District. The Division consists of three Ranges, viz Chamundia, Kusanga and Banigochha.

As per Champion and Seth (1968) classification and Forest Survey of India (FSI, 2011), the forests found in this division broadly fall under four forest type groups: 1. 2B/C3- Orissa semi evergreen Forest, 2. C3/C2- Moist Peninsular sal Forest, 3. 3C/C3- Moist mixed deciduous

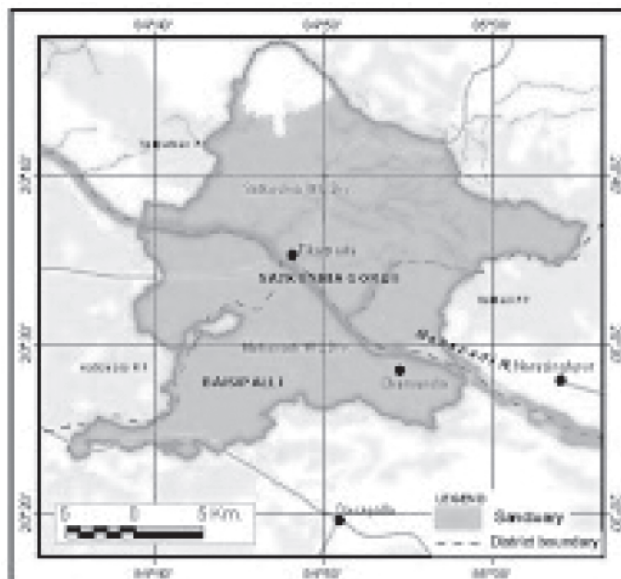


Fig.1. Location map of Mahanadi Wildlife Division

forests and 4. 4RS1- Riparian Fringing Forest. Within these main types intermediate edaphic and seral sub types like bamboo brakes are also found. Flora of these two sanctuaries is dominated by sal (*Shorea robusta*) and its common associates.

This region is dominated by tribes such as Kondhs, Gonds, Mundas and Saoras. The tribals occupy a putative role in the Jagannath cult of Orissa, the Saoras are the early worshipers of Lord Jagannath and till today they have been performing major role in the religious rights of Jagannath temple.

3. Methodology

The field study was carried out during 2014-15 in different tribal villages and forest area at regular intervals in all the seasons and the information on the use of medicinal plants listed in the proceedings of the CAMP workshop for Odisha state (Ved *et al.*, 2008) was obtained through structured questionnaires, complemented by free interviews and informal conversations (Huntington, 2000). The interviews were individually carried out during the first contacts with the local population, local specialists considered by the community as having exceptional knowledge about the use of plants were identified. More than 100 knowledgeable persons or medicine men, Vaidyas, experienced and aged persons and local healers of the villages were consulted for recording local name; parts of plants used methods of drug preparation and recommended doses. Personal interviews and group discussions with local inhabitants revealed some very valuable and specific information about the plants, which were further authenticated by crosschecking with published literature. In

addition, voucher specimens were collected and preserved as herbarium specimens to ascertain correct botanical identity of each species. The species were identified in consultation with Haines (1921-1925) and Saxena and Brahmam (1994-1996) and by matching with authentic specimens available in different Herbaria. The medicinal plants collected are listed here with their botanical names followed by family name, their local names and the parts used for medicinal purpose. The threat category to which a species is assigned as per CAMP workshop (Ved *et al.*, 2007) has also been indicated.

4. Results and discussion

It was observed that the local people and tribals use more than 350 different wild and cultivated plant species to

cure various ailments and diseases. Out of these, the ethno-medicinal/ ethno-botanical uses of only 18 threatened medicinal plants prioritized during the CAMP workshop for medicinal plants of Odisha (Ved *et al.*, 2008) have been enumerated here (Table-1). The species are arranged alphabetically with their botanical names, family, local names, threat assessment category and local uses. Among these species, 2 species were under “Critically Endangered (CR)” category, 7 species under “Endangered (E)” and 9 species under “Vulnerable (VU)” category. Of these, *Gardenia gummifera*, *Gloriosa superba*, *Hedychium coronarium*, *Mesua ferrea*, *Oroxylum indicum*, *Pterocarpus marsupium*, *Rauvolfia serpentina*, *Saraca asoca*, *Symplocos racemosa* etc. were the species frequently used by the locals for various ailments and therefore, need conservation actions.

Table 1

Ethno-medicinal uses of the Endemic and RET plants of Mahanadi Wildlife Division of Boudh-Nayagarh district, Odisha

Plant name	Family	Local name	Habit	IUCN status (Ved <i>et al.</i> , 2008)	Uses
<i>Celastrus paniculata</i> Willd.	Celastraceae	Laibeheda	Climber	VU	The seed oil is massaged against rheumatic joints and paralysis.(K,S) The seed oil is applied externally on the affected part for 15 days to cure all kinds of skin diseases.(K,M)
<i>Gardenia gummifera</i> L.f.	Rubiaceae	Gurudu	Shrub	VU	10 gm of root along with 2 black pepper made into paste & taken twice daily in empty stomach for 15 days with cold water cures metrorrhagia (S, M, K) The gum of the plant is applied on rheumatic swelling to get relief.(K)
<i>Gloriosa superba</i> L.	Liliaceae	Agnisikha	Climber	EN	The paste of rhizome is applied externally for 21 days to check bleeding from piles.(S) Tuber extract 1tsp taken twice a day for 5 days is administered upto 3 months pregnancy for abortion.(M)
<i>Hedychium coronarium</i> Koenig.	Zingiberaceae	Dulala Champa	Herb	VU	Decoction of the rhizome (10 ml) is taken once daily for 1 month against rheumatism.(K,M)
<i>Litsea glutinosa</i> (Lour.) Robins.	Lauraceae	Ledhachali	Tree	VU	Paste of bark is applied externally to relieve pain due to internal injury and in sprain. (K,S) Crushed stem bark is applied on boils.(K)
<i>Mesua ferrea</i> L.	Clusiaceae	Nageswar	Tree	VU	Leaf paste is massaged on head against hemicrania. (K) The flower paste is applied locally twice daily for 7 days against piles.(S,K)
<i>Operculina turpethum</i> (L.) Silva-Manso	Convolvulaceae	Dudhalomo	Climber	VU	Powdered roots (10gm) mixed with fruits juice (20gm) of <i>Phyllanthus emblica</i> is given twice a day for 10 days to check by diabetes.(K,G)

<i>Oroxylum indicum</i> (L.) Vent.	Bignoniaceae	Phemphana	Tree	EN	Bark paste is massaged on joints to relieve of pains and swellings and the juice of bark is given in empty stomach in backache. (K,S)
<i>Paederia foetida</i> L.	Rubiaceae	Prasaruni	Climber	VU	The leaf juice along with black pepper taken once daily for 7 days against swelling and pain of body.(K,S) 50 gm of leaves along with 100 gm of raw rice made into paste & is taken daily for 7 days cure lower back pain.(K) Crushed root mixed with cattle feed, is given for stomach disorder of cow.(K)
<i>Piper longum</i> L.	Piperaceae	Pipali	Creepers	EN	Fruit powder (10 gm) mixed with dry ginger powder (10 gm) is taken every day at bed time for free bowel movement.(S)
<i>Pterocarpus marsupium</i> Roxb.	Fabaceae	Piasal	Tree	EN	The wood is used for making wooden articles & furnitures.(ALL)
<i>Pueraria tuberosa</i> (Willd.) DC.	Fabaceae	Bhuin kakharu	Climber	VU	The tuber paste is applied thrice daily for 3 days against neck swelling of the cattle. (S)
<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz	Apocynaceae	Sarpagandha	Undershrub	EN	Root paste (5gm) applied on the affected part and a piece of root given to patient to chew for 3 days against snake bite. (S,M,K) Bark juice (5ml) given twice a day for two days against stomachache.(S) Five gm. of the root paste is given at bed time for one month against high blood pressure & hypertension. (K G,S)
<i>Saraca asoca</i> (Roxb.) de Wilde	Caesalpiaceae	Ashok	Tree	CR	The decoction of bark (40 gm) taken once in the morning in empty stomach for 15 days to cure gynaecological disorders.(K,M,S) The bark paste applied externally and bandaged on the affected part for 5-7 times cure bone fracture. (S,K)
<i>Scindapsus officinalis</i> (Roxb.) Schott.	Araceae	Gaja pipali	Climber	VU	Water extract of the leaves is given in the morning and the fruit is cooked and eaten for 6 months to cure rheumatism .(K)
<i>Stereospermum chelonoides</i> (L. f.) DC.	Bignoniaceae	Patuli	Tree	EN	Seeds are made into a necklace to wear around the neck to prevent malaria fever. (K)
<i>Symplocos racemosa</i> Roxb.	Symplocaceae	Lodha	Tree	CR	Stem bark decoction with honey (3:2) is given to children below 10 years against liver complaints (K) 20ml of bark decoction taken twice daily in empty stomach for 7 days cure leucorrhoea. (K,S)
<i>Uraria picta</i> (Jacq.) Desv.	Fabaceae	Iswarjata	Undershrub	E	The root is prescribed for coughs & fever (M,G)

(VU- Vulnerable, CR-Critically endangered, EN- Endangered, K- Kondhs, G- Gonds, S- Saoras, M- Mundas)

The tribal folk have a wide range of herbal remedies which are most popular and effective according to their faith and understanding. Plants are real benefactors, whereas the aboriginals are real researchers, who in their struggle to have healthy living, confront with nature and explore new medicinal herbs for self help which in turn are exploited or over exploited. In the present investigation, 18 RET medicinal plant species used by different tribes inhabiting Mahanadi Wildlife Division for their healthcare needs have been identified. In the process wild collection and marketing of herbal drugs, several endangered species of medicinal plants are over-exploited and wild populations of them get substantially reduced. There appears a need to create awareness among tribals about the proper identification, sustainable harvesting and on-farm cultivation of rare species. During the present investigation, species like *Gardenia gummifera*, *Gloriosa superba*, *Pterocarpus marsupium*, *Mesua ferrea*, *Paederia foetida*, *Piper longum*, *Rauvolfia serpentina*, *Saraca asoca* etc. were found to be exploited heavily and need conservation interventions urgently.

Systematic approaches to conservation of medicinal plants and adoption of scientific practices of sustainable resource utilization have been emphasized by Uniyal *et al.* (2006). Conservation of the species in natural habitat may be the best option to save the species from near extinction. Alternatively, reintroduction of rare and endangered species into their natural habitat could be the last resort for recovery and maintaining viable populations of these threatened plant species (Maunder, 1992).

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