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Research Article

ETHNOMEDICINAL PLANTS USED FOR THE TREATMENT OF CUTS AND WOUNDS BY TRIBES OF KORAPUT IN ODISHA, INDIA

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ABSTRACT
Present paper reports the ethnomedicinal plants traditionally used by the tribes in Koraput district of Odisha for the treatment of cuts and wounds. The present study recorded information on 43 plant species belonging to 41 genera and 25 families used by tribes of Koraput district of Odisha for the treatment of cuts and wounds. Among them family Asteraceae is represented by maximum number of plants (11 species) followed by Apocynaceae (3 species). Habit-wise analysis revealed that herbs are dominated with 20 species followed by trees. Most of the plant species reported grows wildly in different habitats and their properties are important in traditional herbal medicine. The most common forms of preparing the crude drugs from plants are juice, paste, infusion, oil, powder, and ash.

Keywords: *Ethnomedicinal Plants, Koraput, Odisha, Tribes*

INTRODUCTION
Ethnobotany is the scientific study of the traditional knowledge and customs of the people concerning plants and their medical, religious and other uses. It is an important part of plant science, which is getting a unique dimension in India, in exploration process of the ethnobotanical wealth of different regions among various ethnic groups. They use plants in different, effective and novel manner. These plants gain further importance in the regions where modern facilities are neither available nor easily accessible, particularly in tribal areas (Dam *et al.*, 1998; Amstrong and Cohen, 1999). Scientific investigations of tribal practices especially their use of herbal medicines would open new area of knowledge. Globally, about 85% of the traditional medicines used for primary health care derived from plants (Franthworth, 1988). According to the World Health Organization (WHO) (2002-2005), as many as 80% of the world's people depend on traditional medicine and in India, 65% of the population in the rural areas use Ayurveda and medicinal plants to help meet their primary health care needs.
The present investigation is carried out in Koraput district, Odisha in order to document the various medicinal uses of the plants and plant parts used by the traditional healers, which would be helpful in the discovery of new medicine in near future. The district inhabited by 62 tribal communities constituting 54.45% of its population (Mohanti *et al.*, 2006). The tribal folk have a high level of traditional knowledge on biodiversity that governs their livelihood sustainable. In the interior areas of Koraput district, plants become the only source of medicine because lack of modern facilities and inaccessibility. Since, in order to meet their day to day requirements for food, shelter etc. tribal people often face injuries like cuts and wounds during their traverse into the forests, the present investigation especially elicits knowledge ethnomedicinal knowledge of plants to cure cuts and wounds.

Study Area
Koraput district lies between 18° 14' to 19° 14' N latitude and 82° 05' to 83° 25' E longitude. It is bounded in the east by Rayagada district (a portion) of Odisha and Srikakulam district of Andhra Pradesh, Bastar district of Chhattisgarh in the west, Nabarangpur district of Odisha in the north and Malkangiri district of Odisha and Visakhapatnam district of Andhra Pradesh in the south (Figure 1). The altitude varies from 500 m near western side to 1600 m on the eastern side with mountain peaks and ridges. Deomali (1672 m) is the highest mountainous peak of Odisha found in this district. Sandy and clay type soil predominate the entire district. The average temperature ranges from 19°C to 37°C. The minimum and maximum temperature is 13 and 42°C in the month of December and May, respectively. The climate of the district

is warm and humid. Humidity is generally high especially in the monsoon and post monsoon months. The annual rainfall is varying from 1420 mm to 1450 mm. Three distinct seasons are felt during the year. Rainy season (mid June to mid October), winter (mid October to February) and summer (March to mid June). Major portion of the annual rainfall is received during southwest monsoon between July to September. Hills, serene environment of dense forest, picturesque river valleys and mountain peaks with ancient shrines are further characteristic features of the district.

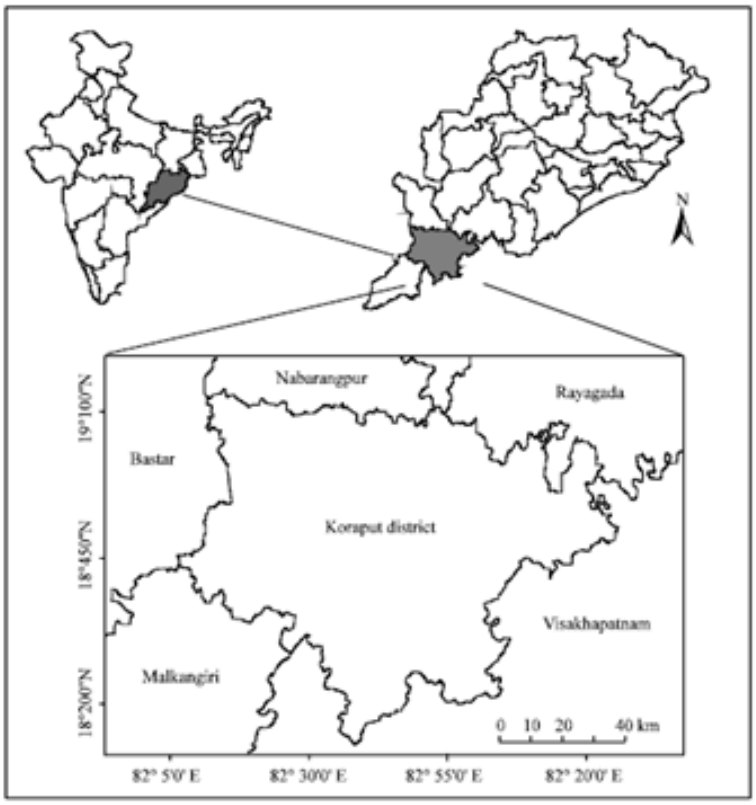

Figure 1: Study Area Showing Koraput District, Odisha

The district is predominantly a tribal populated district. More than 64% of total population is tribal. They are mostly inhabited the forest area, depend on the forest resources for their livelihood (food, fodder and medicine). It is homeland of various tribal communities with their sub-tribes, found in different level of development depending upon their assimilation with the so called mainstream or modern communities. The Kondha, Soura, Koya, Paroja, Bonda, Bhuyan and Gadaba are the predominant tribes found in the interior forest, where as other sub-tribes like Kotiakondha, Jatapu, Ho and Konda Dora are found in fringe areas of the forest.

MATERIALS AND METHODS

The field study was carried out from 2013-2015 in 10 forest ranges of Koraput district *viz*, Jeypore, Boriguma, Boipariguma, Kundra, Kotpad, Gupteshwar, Koraput, Semiliguda, Laxmipur, and Narayanpatna. Ethnobotanical surveys and transect walk were conducted with key informants in different villages of Koraput District for collecting information and plant specimens. Information on plant uses was obtained through semi-structured questionnaires, complemented by informal interviews and conversations. Key knowledge holders, experienced and aged persons, local healers of the villages were consulted for recording first hand information like local name and uses of parts of plants in treatment of cuts and wounds which were further authenticated by repeated and cross-queries. After consulting with the voucher specimens collected from Koraput with authenticated specimens deposited in CAL and K

digital archives, confirmed the identify and deposited at Ethnobotanical Herbarium, Central Botanical Laboratory, Howrah.

RESULTS AND DISCUSSION

The present study provides information on 43 plant species belonging to 41 genera and 25 families used by tribes of Koraput district of Odisha for the treatment of cuts and wounds (Table 1). Among them family Asteraceae is represented by maximum number of plants (11 species) followed by Apocynaceae (3 species). Habit-wise analysis revealed that herbs are dominated with 20 species followed by trees (Figure. 2). Most of the plant species reported grows wildly in different habitats and their properties are important in traditional herbal medicine. The most common forms of preparing the crude drugs from plants are juice, paste, infusion, oil, powder, ash and exudates or fibre. These traditional method of treatment based on medicinal plants are still an important part of their life. Among the different parts used by the tribes, leaves (23 species) constituted the major plant part used in medicine. In this study it was noted that, most cases, the formulation of medicine preparation is based on single drugs.

A good number of plants in the present investigations were reported by many earlier investigators. The application of leaf juice of *Tridax procumbens* for curing cuts and wounds is reported by many workers (Pattanaik *et al.*, 2007; Umapriya *et al.*, 2011; Rout *et al.*, 2014). Topical application of milky latex of *Calotropis gigantea* to treat wounds caused by spines is also reported by earlier workers (Umapriya *et al.*, 2011; Yesodharan and Sujana, 2006). Practice of *Ageratum conyzoides*, *Careya arborea*, *Chromolaena odorata*, *Vernonia cinerea* also stated by other workers to treat cuts and wounds, to check bleeding and as an antiseptic (Yesodharan and Sujana, 2006; Padal *et al.*, 2013; Prusti and Behera, 2007). In several cases method of administration of plant parts is not similar in various regions of the country. This study documented that leaf paste of *Ageratum conyzoides* applied as wound healing agent but other workers from Kerala (Yesodharan and Sujana, 2006) reports leaf paste mixed with calcium hydroxide used for same purpose.

Thus, the present investigation specifies that administration of wound healing plants as infusion, paste, poultice, juice, oil, ash, powder and exudates are the best practices for facilitating to stop bleeding and thereby reducing the intensity of injury. During the survey it was noticed that the study area was rich in medicinal plants useful to treat a wide spectrum of human ailments. The study also noted that the tribes of this area possess good knowledge on uses of plants especially medicinal and edible value. Such studies may produce valuable information for phytochemists and pharmacologists to develop new drugs for various human ailments. The present study observes that the younger generation takes less interest for preserving the traditional knowledge, wisdom and technology. This situation highlights the need for complete documentation of their empirical knowledge for the benefit of the future generations.

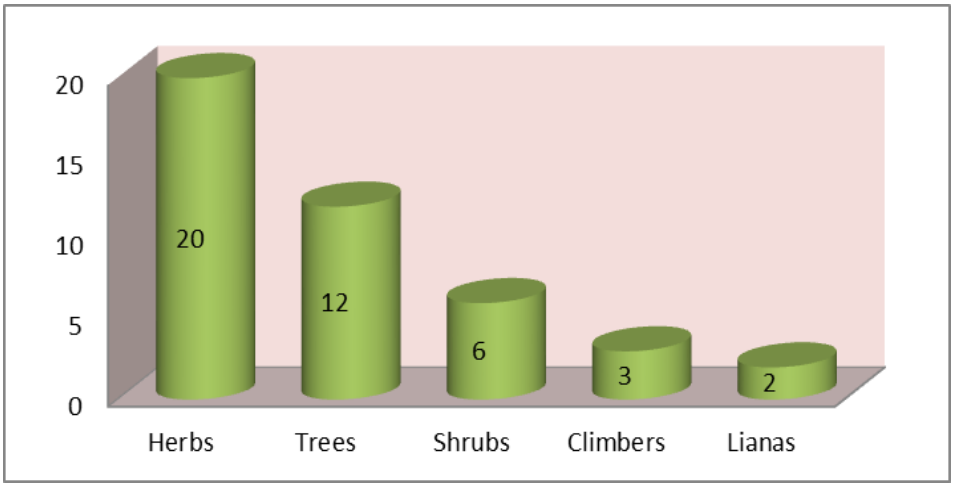

Figure 2: Life Forms (Habits) of the Reported Ethnomedicinal Plant Species

Table 1: Plants Used by the Tribes of Koraput District to Treat Cuts and Wounds

S. No.	Scientific Name	Family	Local Name	Habit	Parts Used	Preparations
1.	*Abutilon hirtum* (Lam.) Sweet	Malvaceae	Vanbhendi, Ban bhendi	Shrub	Leaves	Infusion
2.	*Abutilon indicum* var. *guineense* (Schumach.) K.M.Feng	Malvaceae	Bishkhapri	Shrub	Leaves	Paste
3.	*Acanthospermum hispidum* DC	Asteraceae	Gokhura	Herb	Leaves	Infusion
4.	*Adiantum capillaris-veneris* L.	Adiantaceae	Bhalutat	Herb	Leaves	Paste
5.	*Adiantum philippense* L	Adiantaceae	Kakda Bachhil	Herb	Leaves	Paste
6.	*Ageratum conyzoides* (L.) L.	Asteraceae	Paro, Poro	Herb	Leaves	Paste
7.	*Anodendron paniculatum* A. DC.	Apocynaceae	Bada dudheli mal	Liana	Bark	Paste
8.	*Ardisia solanacea* (Poir.) Roxb.	Primulaceae	Kath champa, Kuntigacch	Shrub	Fruits	Oil
9.	*Baccharoides anthelmintica* (L.) Moench	Asteraceae	Ain	Herb	Leaves	Juice
10.	*Bryodesma indicum* (Milde) Soják.	Selaginellaceae	Pahadi gaach	Herb	Whole plant	Paste
11.	*Buchanania cochinchinensis* (Lour.) M.R.Almeida	Anacardiaceae	Charkoli	Tree	Bark	Powder
12.	*Calotropis gigantea* (L.) Dryand.	Apocynaceae	Arakh, Arak	Shrub	Latex	Exudate
13.	*Careya arborea* Roxb.	Lecythadaceae	Daudi, Kumbhi	Tree	Bark	Thread
14.	*Cassia fistula* L.	Fabaceae	Sonari	Tree	Fruits	Powder
15.	*Cassine glauca* (Rottb.) Kuntze	Celastraceae	False kirchi, Macha gaachh	Tree	Fruits	Oil
16.	*Cayaponia laciniosa* (L.) C.Jeffrey	Cucurbitaceae	Mahakaal	Climber	Whole plant	Paste
17.	*Celastrus paniculatus* Willd.	Celastraceae	Pengu, Kukuda mondi, Pengukoli	Liana	Leaves	Paste
18.	*Chromolaena odorata* (L.) R.M.King & H.Rob.	Asteraceae	Gandhari, Soing	Shrub	Leaves	Infusion
19.	*Cissampelos pareira* L.	Menispermaceae	Akalbindu, Kidkida	Climber	Leaves	Paste

20.	*Cleome viscosa* L.	Cleomaceae	Bara, Bansarsa, Bansurs	Herb	Leaves	Paste
21.	*Crotalaria pusilla* DC.	Fabaceae	Gulgula	Herb	Leaves	Paste
22.	*Croton bonplandianus* Baill.	Euphorbiaceae	Agnikumari, Gandtulai	Herb	Latex	Exudate
23.	*Curcuma aeruginosa* Roxb.	Zingiberaceae	Ban haldi	Herb	Rhizome	Paste
24.	*Cynoglossum zeylanicum* (Vahl) Brand	Boraginaceae	Gandhari chap	Herb	Fruits	Exudate
25.	*Dalbergia volubilis* Roxb.	Leguminosae	Dhoben Mal, Dhobli	Tree	Leaves	Paste
26.	*Eupatorium triplinerve* Vahl	Asteraceae	Ayaappan	Shrub	Leaves	Juice
27.	*Grangea maderaspatana* (L.) Desf.	Asteraceae	Chakri, Jungli dahana	Herb	Leaves	Paste
28.	*Holarrhena pubescens* Wall.	Apocynaceae	Pitkurai, Kurai, Korai	Tree	Latex	Exudate
29.	*Ipomoea carnea* Jack.	Convolvulaceae	Umri, Amraigaachh	Climber	Latex	Exudate
30.	*Isodon nilgherricus* (Benth.) H.Hara	Lamiaceae	Ban Muli	Herb	Fruits	Ash
31.	*Magnolia nilagirica* (Zenker) Figlar	Magnoliaceae	Tangachina	Tree	Bark	Paste
32.	*Persicaria glabra* (Willd.) M.Gómez	Polygonaceae	Mangar, Gaaddona	Herb	Whole plant	Paste
33.	*Pluchea indica* (L.) Less.	Asteraceae	Puchia	Herb	Leaves	Paste
34.	*Scoparia dulcis* L.	Plantaginaceae	Bansarso	Herb	Leaves	Paste
35.	*Sphaeranthus indicus* L.	Asteraceae	Batiphool	Herb	Leaves	Paste
36.	*Streblus asper* Lour.	Moraceae	Sahada, Sada	Tree	Fruits	Powder
37.	*Synedrella nodiflora* (L.) Gaertn.	Asteraceae	Cassandra, Kesandra	Herb	Leaves	Paste
38.	*Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.	Combretaceae	Poanisahaj, Arjun, Panisag, Kha.	Tree	Leaves	Poultice
39.	*Terminalia bellirica* (Gaertn.) Roxb.	Combretaceae	Asan, Saaj, Baheda	Tree	Leaves	Poultice
40.	*Tridax procumbens* L.	Asteraceae	Vishalyakarani	Herb	Leaves	Infusion
41.	*Vernonia cinerea* (L.) Less.	Asteraceae	Kodilitha	Herb	Whole plant	Paste
42.	*Vitex peduncularis* Wall. ex Schauer	Lamiaceae	Chadaiguda	Tree	Leaves	Powder
43.	*Xylia xylocarpa* (Roxb.) Taub.	Leguminosae	Tangani, Siari, Siali	Tree	Bark	Ash

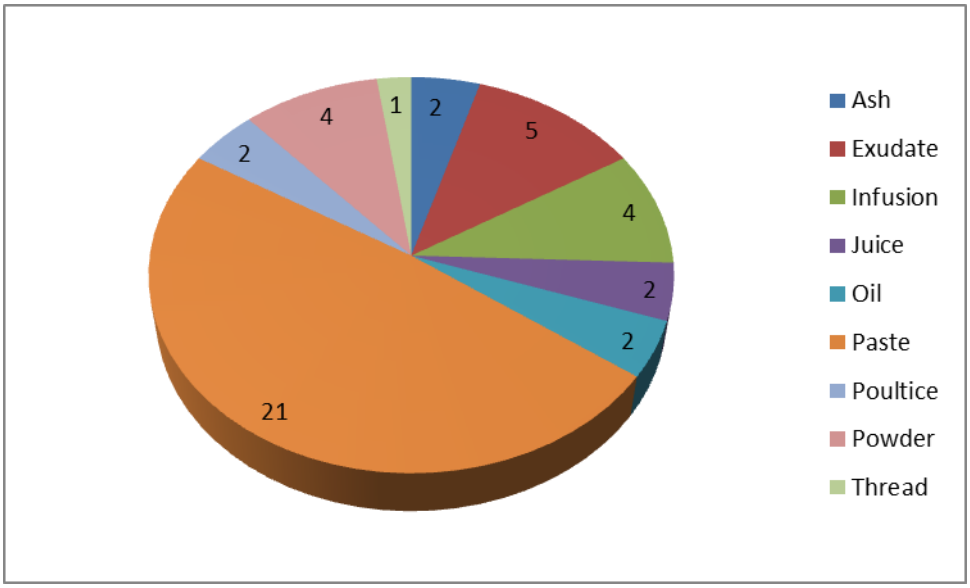

Figure 3: Number and Form of Utilization of Plants to Treat Cuts and Wounds

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