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Preliminary Study of Ethno-Medicinal Plants Used to Cure Different Diseases in Coastal District of Orissa, India

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Abstract: This study documents phytotherapeutic practices in Kendrapara district of Orissa, India. It is primarily based on field surveys carried out in villages, where dwellers provided information on plant species used as medicine, parts used to prepare the remedies, and the illnesses to which the remedies were prescribed. The plant parts, viz. leaf, bark, seed, root, tuber, fruit and whole plant were used in raw or cooked forms for the treatment of piles, asthma, skin disease, fever, rheumatism etc. The species used as medicinal drug comprise 28 families. The most important families were Euphorbiaceae, Combretaceae, Liliaceae, Melliaceae and Zingiberaceae.These phytotherapeutical resources were used for the cure of 26 illnesses.

Key words: Ethnomedicine, Kendrapara, Orissa, phytotherapy, traditional knowledge

INTRODUCTION

For centuries plants have been an important source of drugs. Many plant extracts are well established in clinical practice and are likely to remain so for some time until better, cheaper, less toxic or more efficacious alternatives become available. Of the pharmacologically active principles found in plant kingdom, higher plants are arguably the most important group. Many plants are used with medicinal properties and they cover a broad spectrum of pharmacological effects. It is especially meaningful in tropical countries due to the great variety of plants belonging to their eco-system. In India medicinal plants have long been used to treat different kinds of diseases. Today there is an increasing desire to unravel the role of ethnobotanical studies in trapping the centuries old traditional folk knowledge as well as in searching new plant resources of food, drug etc. (Jain, 1987, 1991). People living in the developing countries rely quite effectively on traditional medicine for primary health care (Sullivan and Shealy 1997; Singh, 2002). Indian traditional medicine is based on different systems such as *Ayurveda*, *Siddha* and *Unani* used by various communities (Gadgil, 1996). The Kendrapara district of Orissa, eastern India, harbors a rich diversity of ethnobotanical species, which generate considerable benefits from social and economic perspectives. Until now, people are preparing medicines from their available species of plants, which are used to treat common diseases. Ethnomedicinal uses of plants in different parts of Orissa are well studied (Yoganarasimhan and Dutta 1972; Saxena and Dutta, 1975; Mudgal and Pal, 1980; Saxena *et al.*, 1988; Subudhi *et al.*, 1992; Choudhury *et al.*, 1993; Pandey and Rout, 2006; Rout and Pandey, 2007; Pattanaik *et al.*, 2008; Rout *et al.*, 2009). But Kendrapara district is often ignored. In spite of the luxuriant growth of ethnomedicinal plants in and around different blocks of the said district, they have not been studied taxonomically or ethnobotanically. The present study has been designed to report the ethnobotanical uses of plants to treat common diseases on the basis of field surveys and taxonomic identification of plants. The objective of this study is to motivate the agriculturist/farmers to come forward for the utilization, cultivation and preservation of traditional herbs.

MATERIALS AND METHODS

Study area: The study site was Rajkanika block of Kendrapara district situated in the central part of the Orissa (20º17′-22º34′N and 85º40′-87º10′E). The climate of the region is monsoonal with coastal characteristics. Three distinct seasons are felt during the year. Rainy season (mid June till October), winter (mid October to February) and summer (March to mid June). The air temperatures range from 37ºC in summer to 13ºC in winter with an average annual rainfall of about 130cm. The region is subject to cyclones during the wet seasons and coastal areas are affected by the resulting strong winds and intense rainfall. Agriculture is well developed. The intimate association and dependence of the communities on the local natural resources have enriched them with invaluable knowledge on bio-resource utilization and consequently they have developed extensive knowledge on various plants.

In Rajkanika block of Kendrapara district phytotherapy (treatment with medicines from plant and their derived products) form an integral part of the local culture, and information about plants and their uses are passed from generation to generation through oral folk

lore, primarily amongst the elderly; they are natural retainers of traditional knowledge in their respective communities. The field study was carried out from July 2007 to December 2009, 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, in other words, people who consider themselves, and are considered by the community as having exceptional knowledge about the use of plants. Fifty-two (29 men and 23 women) 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 Rajkanika block. Collections are valuable because they serve as voucher specimens, records of the plants that are known by community and function as specimens for systematic identification (Martin, 1995). A voucher specimen facilitates the identification of the species encountered during the research and permits colleagues to review the results of the study (Jain and Rao, 1977; Jain, 1987). Knowledgeable persons or 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 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 is important to crosscheck information with different people and compare the results from different methods (Cunningham, 2001). Interviews with people out of the village, pastures or forests were conducted on a systematic basis to know more details about species, their management and distribution. The consulted literatures during field time for identification of species were Haines (1921-25), Mooney (1950), Ambasta (1986), Saxena and Brahmam (1989, 1994-1996) and Kirtikar and Basu (1991). Specimens were identified and deposited in the herbarium of the Botany Department, S.N. College, Rajkanika, Orissa, India.

RESULTS AND DISCUSSION

Traditional healers use their five senses to diagnose the diseases, which are remarkable because they live in interior areas and lack the use of modern scientific equipments for treatment; however, they treat diseases using medicinal plants and animals (Santhya *et al*., 2006). Documentation of such plants and animals from the perspective of ethno biological angle is important for the understanding of indigenous knowledge systems. These resources are genetically important for future research.

The results reveal that 41 plant species were used for medicine purposes in the surveyed area. The inventoried species comprise 28 families. The most important medicinal species were: *Aegle marmelos*, *Datura metel*, *Lawsonia inermis*, *Mangifera indica*, *Mimosa pudica*, *Saraca indica*, *Zyzyphus mauritiana*. The medicinal plant parts, leaf, bark, seed, root, tuber, fruit and whole plant were used in raw or cooked forms (Table 1). These species were used to treat 26 different diseases. The most cited diseases were: piles, asthma, skin diseases, fever and rheumatism. Although this is first hand knowledge about ethno-medicine in Kendrapara, thorough pharmacological investigations are recommended since the informants claim the uses with confidence and strong belief. Phytotherapeutics are usually applied in simple ways, mostly through ingestion or direct application to the affected area and usually not in association with other animal derived ingredients. In some cases, however, an association with medicinal plants or other resources is observed as, for example, for the treatment of asthma using the "Gayala" (*Bos gaurus gaurus)* bile juice in association with sun-dried rice (Oryza sativa), or the elephant (elephas maximus) tusk with coconut oil (*Cocos nucifera*) for the cure of skin diseases (Mishra *et al*., 2010). It is known that the use of medicinal plants is frequent in several countries (Swanton *et al*., 1990; Gadgil *et al*., 1993; Cox, 1994; Milat and Hall, 2000; Kunwal and Duwadee, 2003; Jeyachandran and Mahesh, 2007; Kayang, 2007) and that often there are overlaps in the medicinal use of plants and animals in traditional medicine for humans (Alves and Rosa 2005; Alves *et al*., 2007, 2009). Consequently it is assumed that there is a close association between phytotherapeutic and zootherapeutic practices in traditional medicine for human usage. The catalogued plants in the present study are common in the surveyed area, this way it is evidenced that the flora composition of Kendrapara influences the choice of medicinal plants' usage. 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 results of my study demonstrated the persistence of folk medicine practices in Kendrapara district, that the people are still dependent on indigenous knowledge for health care that are being influenced by culture and socio-economic aspects, providing a cheaper and accessible alternative to the high cost pharmaceutical remedies. In spite of the overwhelming influence and our dependence

Table 1: Ethnobotanical inventory of Kendrapara district

Botanical name, family & local name	Parts used (Disease and condition)	Mode of application
Croton sparsiflorus Morung (Euphorbiaceae)'Nandababulii'	leaf (Blood clotting)	7-8 leaves are crushed in palm and its juice is applied.
Adhatoda vasica Nees.(Acanthaceae)'Basanga'	leaf(Cough)	Five leaves are taken with honey for three days.
Aegle marmelos Correa ex Roxb. (Rutaceae) 'Bela'	Bark, leaf, fruit (labour pain,indigestion,dysentry)	The bark powder is mixed with the juice of *Oroxylum indicum* and *Mangifera indica* (leaf) and fed to the labour pain patient. 7leaves with 5 *Piper nigrum* for seven days will be effective for worms and dysentery. Ripe fruit pulp is given twice a day for 2-3 days to improve digestive disorders.
*Allium garlic*L. (liliaceae) 'Rashuna'	Seed(rheumatism)	8-10 seeds are boiled in mustard oil, the oil is applied on the affected area.
Aloe vera L. (liliaceae) 'Ghekuanri'	Leaf(Headache and spot on face)	One teaspoonful of leaf juice is given twice a day for three days.
Andrographis paniculata Nees.(Acanthaceae) 'Chireita'	Whole plant(Fever, Piles, skin diseases , diabetes)	A dense paste of young shoot or leaves is prepared with little amount of water and applied externally in anus in the form of thick round cake in case of simple piles. Fresh leaf (5-7) is taken orally is effective for skin diseases, diabetes.5gm. Plant powder mixed with one spoonful of honey made into pills and given orally to cure warts. One teaspoonful decoction is given twice a day for two days in case of fever.
Anona squamosa L. (Annonaceae) 'Atta'	Leaf (Maturation of boils)	Fresh leaf paste is slightly warmed and applied externally for early maturation of boils.
Areca catechu L .(Arechaceae) 'Gua'	Seed (leaeucorrhea)	Raw seed is put in water and in the morning that water is taken.
Asparagus recemosus Willd (Liliaceae) 'Satabari'	Leaf ,root(Spermatorrhoea)	Decoction added with Aswagandha, used thrice a day. Root paste is applied externally on abdomen for quick delivery.
Azadirachta indica A.Juss. (Meliaceae) 'Neem'	Leaves, Bark (Skin)	About 20g of bark is boiled in 1 liter of water. Bath with the boiled water will cure skin diseases.
Bryophyllum calycinum Salis. (Crassulaceae) 'Amarpoi'	Leaf (dysentery)	Three leaves added with *Piper nigrum* is taken for three days.
Centella asiatica (Apiaceae) 'Thalkudi'	Leaf(Indigestion)	3-4 fresh leaf is taken everyday before breakfast
Coriandum sativum L.(Apiaceae) 'Dhania'	Leaf(diabetes)	Leaf juice is taken for 21 days.
Curcuma longe L. (Zingiberaceae) 'Haldi'	Tuber(worms)	Raw tuber paste is taken orally for 7 days.
Cynodon dactylon Pers.(Poaceae) 'Duba'	Whole plant(Nose bleeding)	Whole plant is crushed and its juice is extected.3-4 drops of juice applied externally on nose.
*Datura metel(*Solanaceae)'Kaladudura'	Leaf(rheumatism)	Juice is extracted from leaf, slightly warmed; bind the boiled juice in the affected part.
Erythrinia indica Lamk. (Caesalpiniaceae) 'Paladhua'	Leaf(worms)	Leaf juice Whole plant+ *Piper nigrum* +honey is taken orally for 7 days
Jatropha gossypifolia L. (Euphorbiaceae) 'Amarjada'	Stem(Dental diseases)	The sticks are used as tooth brushes, and are said to strengthen the gums and to cure spongy gums/gum boils.
Lantana camara L. Verbenaceae'Nagaaira'	Leaf	Fresh juice of leaves is applied on fresh wounds immediately to effective stop bleeding
Lawsonia inermis L. (Lythraceae) 'Manjuati'	Root (Jaundice)	Roots are crushed and its juice with rice water is given for 7 days.
Limnophila heterophylla Benth.(Seropholariaceae)'Hidimichi'	Leaf(Ophthalmic disease)	Leaf juice is taken orally incase of eye diseases.
Manilkara achras L. (Sapotaceae) 'Sapeta'	Fruit(dysentery)	Fruit is crushed; juice is extracted and taken with sugar thrice daily for 3 days.
Mangifera indica L. (Anacardiaceae) 'Amba'	Leaf (diabetes)	Leaf juice is taken in empty stomach for 21 days.
Mentha viridis L. (Lamiaceae)'Podina'	Leaf(Gastritis)	6-7 leaves is to taken in empty stomach.
Mimosa pudica L. (Mimosaceae) 'Lajakuli'	Whole plant(Piles, cough)	Decoction of whole plant is given in bleeding piles. Leaf juice with honey is effective for cough.
Minusops elengi L.(Sapotaceae) 'Baula'	Bark(Dental diseases)	Bark is dipped into the water whole night and its water used as gargle to cure the diseases of the gums and teeth.

Table 1: continued

Momordica charantia L. (Meliaceae) 'Kalara'	Leaf and fruit(Worms, diabetes)	Leaf juice is taken in empty stomach for diabetes daily and fruit in meal for one month.
Musa paradisica L. (Musaceae) 'Kadali'	Whole plant(dysentery)	Ginger (5gm) shade dried one piece and raw (5gm) one piece is to be set on the *Musa paradisica* plant whole night taken it in the morning and eat once daily for 3 days.
Nyctanthes arbortristis (Oleaceae) 'Gangasiuli'	Leaf (Fever, malaria)	Seven leaves added with five *Piper nigrum* and some honey is taken for seven days
Ocimum sanctum L. (Lamiaceae) 'Tulasi'	Leaf (Cold, cough, diabetes)	Leaf juice with honey is given for 3-7 days for cough and cold.1:1 ratio of Tulasi leaf and Neem leaf paste is very effective for diabetes.
Piper betel L. (Piperaceae) 'Pana'	Leaf, tender stalk (constipation ,indigestion)	Tender stalk of the leaf dipped in castor oil is introduced in the rectum to cure constipation. The juice of the leave is dropped into the ear to relieve earache.1-2 leaf is taken orally for indigestion.
Piper nigrum L. (Piperaceae) 'Golmaricha'	Gastro-intestinal problems	5-6 seeds with common salt is taken for 5 days.
Punica granatum L. (Punicaceae) 'Dalimba'	Leaf (dysentery)	Leaf juice is given for 3 days.
Psidium guayava L. (Myrtaceae) 'Pijuli'	Leaf (dysentery)	Leaf juice is given for 3 days.
Saraca indica L. (Cesalpiniaceae) 'Ashoka'	Bark (Menstruation trouble)	About 20g of bark is boiled in 1 liter of water till it becomes one fourth of its volume.5 ml of this decoction along with milk is taken orally in empty stomach twice a day for one month
Syzygium cumuni L. Skeels (Myrtaceae) 'Jamu'	Bark seed (Asthma, dysentery, diabetes)	Seed powder is mixed with juice of *Asparagus* and *Achyranthus* and taken with sugar candy twice a day.
Tamarindus indica L. (Caesalpiniaceae) 'Tentuli'	Seed (Scorpion bite)	Paste is prepared from seeds and applied over the bitten area
Terminalia arjuna (Roxb. Ex. DC) W.& A. (Combretaceae) 'Arjuna'	Bark (Asthma)	Bark powder of this plant is mixed with juice of *Adhatoda vasica* and *Helicteres isora* and given to the patient twice a day for seven days.
Terminalia chebula (Gaertn.) Retz. (Combretaceae) 'Harida'	Fruit (Indigestion, chest pain)	Infusion of dried fruits is given as a drink in early morning for three days. One teaspoonful of fruit powder is given internally with warm water once daily before going to bed to cure chest pain.
Trigonella foenum-graecum L. (Fabaceae)) 'Methi'	Seed (diabetes)	One teaspoonful of seed powder is given twice a day for one month.
Zyzyphus mauritiana Lamk.	Leaf(Measles)	Fresh tender leaf 5-7, black pepper seeds 2-3 (*Amonum aromaticum*), flower i.e. tip portion of (*Syzygium aromaticum)* and honey are mixed and taken orally in empty stomach twice a day for one week.

on modern medicine and tremendous advances in synthetic drugs, many people still rely on herbal drugs the reason is that, if the herbal medicines are used properly they don't have any side effects. Other studies are also necessary to preserve the popular medicinal knowledge which is important to enhance our understanding of the relationship among men, society and nature, and also to elaborate more effective strategies for conserving natural resources especially to the Kendrapara district, where the studies concerning this subject are scarce. The possible benefit of plant-derived medications constitutes a rewarding area of research, particularly in countries such as India which have a rich biodiversity of plant resources coupled with a high prevalence and variety of infectious diseases where sustainable utilization of the biodiversity can be carried out. This wildlife is a valuable renewable resource, which can continue to produce benefits only if adequate habitats and protection is provided. It is suggested that the government should integrate this health care system into the existing one to ensure proper development and harnessing ethno- medicine in India.

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