

Full Length Research Paper

Ethno-zoological studies and medicinal values of Simlipal Biosphere Reserve, Orissa, India

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This paper documents zootherapeutic practices in Simlipal Biosphere Reserve of Mayurbhanj district, Orissa, India. It is primarily based on field surveys carried out in villages, where dwellers provided information on animal species used as medicine, body parts used to prepare the remedies, and the illnesses to which the remedies were prescribed. The dominant tribes involved in using animal parts as medicines in the district are Santhal, Kol, Bhumija, Bhuyan, Mahalis, Sounti and Saharas. The animal parts, namely, blood, excreta, feather and hair were used in raw or cooked forms for the treatment of piles, asthma, skin diseases, fever and rheumatism. The species used as medicinal drug and their respective families were: *Bos gaurus gaurus*(Mammalia), *Buceros bicornis* (Bucerotidae), *Crocodylus palustris* (Crocodilidae), *Pavo cristatus*(Phasianidae), *Hystrix indica* (Rodentia), *Pterocarpus giganteus* (Chiroptera) and *Sus scrofa cristatus* (Mammalia).These zootherapeutical resources were used for the cure of 12 illnesses.

Key words: Ethnomedicine, ethnozoology, Orissa, Simlipal, traditional knowledge, zootherapy

INTRODUCTION

Humans depend on biodiversity and the capacity of ecosystems to provide a multitude of bioresources and services that underpin a healthy human and natural environment. Plants and animals have been used as medicinal sources since ancient times (Alves and Rosa, 2005; 2007; Anyinam, 1995; Chivian, 1997; Lev, 2003) and even today animal and plant-based pharmacopeias continue to play an essential role in world health care (Alves and Rosa, 2007; Chivian, 1997). More than half of the world's modern drugs are derived from biological resources, which support the traditional and modern pharmaceutical sectors (Singh, 2002; Sullivan and Shealy, 1997) . All systems of traditional medicine have their roots in folk medicine and household remedies. Whereas some of those earliest remedies were subjected to certain refinements, revisions and improvements through practices by trained medicine men. The people were using various recipes traditionally from generation to generation. Some of them have been

in recorded form and some of them are not. Today, there is an increasing desire to unravel the role of ethno biological studies in trapping the centuries old traditional folk knowledge as well as in searching new resources of food, drugs etc. (Jain, 1987, 1991) .Indeed, medicinal plants and animals have been used in virtually all cultures as a source of medicine (Alves and Rosa, 2005; Phillipson and Anderson 1989; Yineger et al. 2007). India is an outstanding country both because of its great wealth of genetic resources and complex cultural diversity. The adaptation of the various human groups to the rich biological resources has generated invaluable local knowledge systems that include extensive information on plant and animal uses in general and medicinally useful species in particular. Nevertheless, the use of animal species as remedies, although representing an important component of traditional medicine (sometimes in association with plant species), has been less studied than medicinal plants in the country (Mahata, 2002; Negi and Payal, 2007; Roy and Singh, 2007; Prabhakar and Roy, 2009) . In this context, some of the uses of wild animals by tribals of Simlipal Biosphere Reserve (SBR) of Orissa are not known outside their restricted

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communities. The tribal people of SBR fully depend on plants and animals for food, fodder, fibre, medicine and fuel. Until now, in the core and buffer areas people prepare medicines from their available species of animals which are used extensively to cure common diseases. Although a number of ethnobotanical inventories concerning the use of medicinal plants in human health of this forest has been published (Bal, 1942; Yoganarsimhan and Dutta, 1972; Saxena and Dutta, 1975; Mudgal and Pal, 1980; Saxena et al., 1988; Pandey and Rout, 2006), the use of animal parts as medicine has been neglected and there appears to be no study in SBR which is considered as one of the mega diversity zone of the country.

The neglect of traditional food and medicines may seriously deteriorate the health and well being of traditional peoples (Pieroni et al., 2002; Begossi, 1998). Furthermore, nature-based traditional food and medicine are generally viewed as inter-changeable, diet being highly regarded as the primary basis for sustaining and/or restoring health and well-being. Therefore, there is an urgent necessity to document traditional knowledge, focusing on the maintenance of this important cultural practice. The present study documents zootherapeutic practices in rural areas of the SBR located in the Mayurbhanj district of Orissa in the eastern India. Documentation on zootherapeutical practices can assist in protecting traditional knowledge, and in ensuring that future users recognize the contributions made by traditional communities, the current custodians of traditional knowledge.

STUDY AREA

The SBR (Figure 1) is in the central part of the Mayurbhanj district of Orissa, eastern India ($20^{\circ}17'$ to $22^{\circ}34'N$ and $85^{\circ}40'$ to $87^{\circ}10'E$) covering an area of 5569 km² which forms one of the mega biodiversity zones of the country with a rich population of flora and fauna. The landscape of Similipal comprises numerous rolling hills covered with tropical semi-evergreen forest, tropical moist deciduous forest, dry deciduous hill forest, high level Sal forest, grass land and savannah. There are 4 villages inside the core area, 61 villages in the buffer zone and 1200 villages in the transitional zone of SBR with a population of about 4.5 lakhs. Here tribes occupy a big chunk of the population constituting 73% of it; 53 communities both aboriginal and migrated are found in the district (Naik, 1998). The dominant tribes in the district are Kharia, Mankdias, Santhal, Kol, Bhumija, Bhuyan, Mahalis, Sounti and Saharas. Some of the tribes namely Kharia, Mankdias and Saharas are still in the primitive state of living.

Agriculture is semi-developed and therefore most of them depend solely on forests for their daily and perpetual need ranging from food to medicine (Saxena et al., 1988). The intimate association and dependence of

the tribal communities on the local natural resources have enriched them with invaluable knowledge on bio-resource utilization and consequently they have developed extensive knowledge of it. Kharias and Saharas mostly collect non-timber forest products like honey, resin, lac and arrowroot etc. Mankdias collect mostly Siali fiber and use it for rope making. Some of the tribes like Gond and Bathudi spend their time in collecting sabai grass from the forestland. They hardly come out of the forests to the plains only to collect salt, potato, onion etc. in exchange of honey and resin collected by them. Normally the tribal women along with their children collect the non timber forest products in different pockets of the district. Therefore literacy rate in tribal areas is very low.

The total number of species comprising the flora of hills is 990, representing 145 families of vascular plants (Haines, 1921 to 1925; Mooney, 1950). Saxena and Brahmam (1989) estimated a total of 1076 species of plants in Similipal representing 168 families of vascular plants. The identified species of fauna in Similipal includes 12 species of amphibians, 29 species of reptiles, 264 species of birds and 42 species of mammals. According wild life report of Orissa (2003), the estimated number of wild animals in the Similipal Biosphere Reserve is as follows; Tiger 102, Leopard 126, Elephant 388, Bison about 950, Wild boar 10,000, Sambar 7000, Spotted deer 2500 and Barking deer 4000. Similipal contributes more than 50% to the total number of tigers and 25% of total elephant population in Orissa (Anonymous, 2003).

The climate of the Similipal is tropical. Three distinct seasons are felt during the year. They include the rainy season (mid June till mid October), winter (mid October to February) and summer (March to mid June). The annual rainfall ranges from 1200 mm to 2000 mm. The temperature ranges from 9.8°C to 33.5°C. The southern and western aspects are cooler and north-eastern aspects are warmer. Periodic earth tremors, thunder storms during the rains and dust storms in late May and early June are other characteristic features of Similipal.

MATERIALS AND METHODS

In SBR, Zootherapy (treatment of ailments with medicines from animals and their derived products) form an integral part of the local culture, and information about animals 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 2000 to December 2003, and information on the use of medicinal animals 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 animals. Fifty one (28 men and 23 women) were interviewed. Among these interviewees, 10% were aged 21 to 40 years, 40% were 61 years old or more and half of the sample (50%) were in the 41 to 60 age

SIMILIPAL BIOSPHERE RESERVE

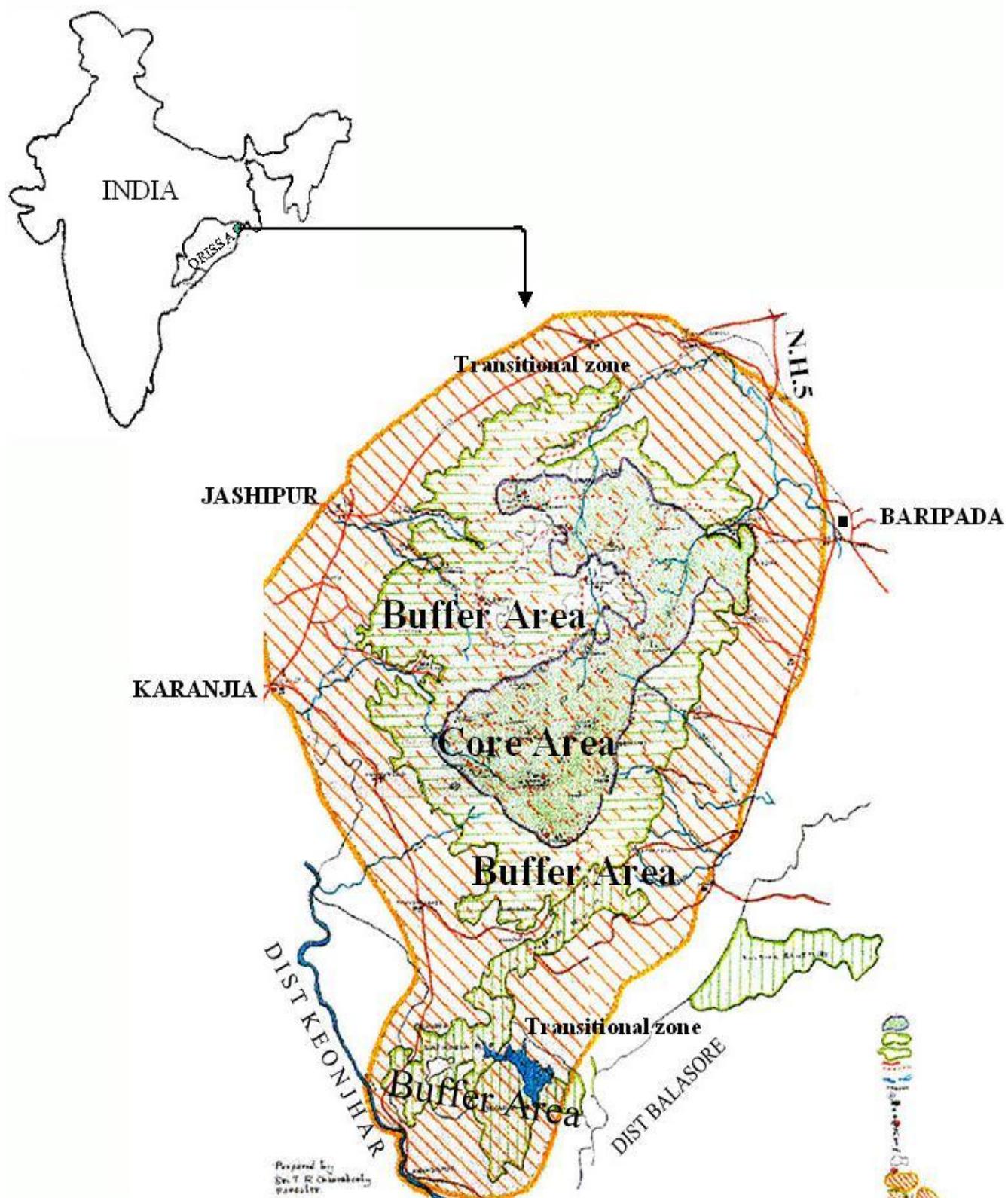


Figure1. Map of Simlipal Biosphere Reserve.

range. Eight villages in the buffer zone and four villages in the core zone were selected on the basis of broad socio-economic-cultural diversity. Collections are valuable because they serve as voucher specimens, records of the animals 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, 1976; Jain, 1987; 1991).

Knowledgeable persons or medicine men, popularly known as "Kaviraj's" experienced and aged persons, local healers of the villages were consulted in recording local name ,animal parts used, drug preparation methods and recommended doses. Personal interviews and group discussions with local inhabitants revealed some very valuable and specific information about the animals, which were further authenticated by crosschecking. In addition to crosschecking and recording folk names of animals through collecting voucher specimens, it was important to crosscheck information with different people and compare the results from different methods as reported in 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. In the enumeration, all animals have been arranged alphabetically. The correct zoological name is followed by family/order name within parenthesis, local name in Oriya, ethno zoological uses and their medicinal uses were represented. The novelty of claims has been confirmed from the earlier workers (Prater, 1981; Sharma, 2002; Singh, 1998).

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 thirteen animal species were used for medicine purposes in the surveyed area. Their uses were not reported by earlier investigators (Pandey and Rout, 2007; Rout et al., 2009; Saxena and Brahman, 1989).The inventoried species comprise 3 taxonomic categories: mammals (07), reptiles (02) and aves (04). The most important medicinal species were: *Bos gaurus gaurus*, *Buceros bicornis*, *Crocodylus palustris* , *Pavo cristatus* ,*Hystrix indica*, *Pterocarpus giganteus*, *Sus scrofa cristatus*.The medicinal animal parts, fat, feathers, hairs, bile, oil, blood, tusk, milk and liver were used in raw or cooked forms (Table 1). These species were used to treat 12 different diseases. The most cited diseases were: piles, asthma, skin diseases, fever and rheumatism. Although this is first hand knowledge about ethno-medicine in SBR, thorough pharmacological investigations are recommended since the informants claim the uses with confidence and strong belief. Zootherapeutics 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. It is known that the use of medicinal animals is frequent in several countries (Alves et al., 2007; 2009; Alves and Rosa, 2008;) and that often there are overlaps in the medicinal use of plants and animals in traditional medicine for humans (Alves et al., 2007; 2009). Consequently, it is assumed that there is a close association between phyto-therapeutic and zootherapeutic practices in traditional medicine for human usage.

The catalogued animals in the present study are common in the surveyed area, this way it is evidenced that the fauna composition of SBR influences the choice of medicinal animals' usage. For example peacocks are frequently encountered in the local SBR fauna. A similar tendency was reported by Adeola (1992) who observed that the animals 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. It is said that only a few years ago, the tribals of Similipal have developed a tradition of conducting "Akhand shikar" by setting the forest ablaze, from April to June every year. As a result, the tribals consume the herbivorous animal and use some of their parts to cure their diseases (Nanda, 1998). But in reality, the jungle pirates are very active round the year in looting the forest and poaching, which cause irreparable damage to the biosphere.

Conclusion

Our results demonstrated the persistence of folk medicine practices in Similipal area, that the tribal communities 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. 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 SBR biome, where the studies concerning this subject are scarce. The possible benefit of animal-derived medications constitutes a rewarding area of research, particularly in countries such as India which have a rich biodiversity of animals 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

Table 1. Ethno zoological inventory of Simlipal Biosphere Reserve.

S/N	Zoological name, family and local name	Parts used	Diseases	Mode of application
1	<i>Bos gaurus gaurus</i> (Mammalia) 'Gayala'	Bile	Asthma	Bile juice mixed with Arua rice powder and is given twice a day for 7 days.
2	<i>Buceros bicornis</i> (Bucerotidae) 'Kuchilakhai'	Oil	Rheumatism	Oil is heated and applied locally.
3	<i>Cervus unicolor</i> Kerr. (Mammalia) 'Sambar'	Blood	Chronic dysentery	Dry blood is mixed with sugar and administered for 3 days.
4	<i>Crocodylus palustris</i> (Crocodylidae) 'Gumohan kumbhira'	Excreta	Skin diseases	Little quantity excreta mixed with cocoanut oil and applied locally.
5	<i>Elephas maximus</i> L. (Proboscidea) 'Hati'	Tusk	Skin diseases and Eczema	Elephant tusk paste made with cocoanut oil and is used for 15 days.
6	<i>Hystrix indica</i> Kerr. (Rodentia) 'Jhinka'	Rectum	Colic	The rectum is boiled in water and is given twice a day for 7 days.
7	<i>Lissemys punctata punctata</i> (Chelonidae) 'Panka kaincha'	Fresh blood	Asthma	Fresh blood is mixed with few quantity of sugar and given to patient for drinking.
8	<i>Manis crassicaudata</i> (Manidae) 'Bajrakapta'	Feather	Piles	The ring is made up from the feather and tied on finger.
9.	<i>Melursus ursinus</i> (Ursidae) 'Bhalu'	Hair, Fat	Fever, rheumatism	Hair burnt mixed with honey and is given to patient twice a day for 3 days.
10	<i>Panthera tigris</i> (Felidae) 'Mahabala bagha'	Liver, gallstone, milk	Courage, Abscesses, sooth ailments of the eye	The gall stone mixed with the ailments and is taken as a tonic. The liver is eaten to impart courage, milk is given to patient to cure eye.
11	<i>Pavo cristatus</i> L. (Phasianidae) 'Mayur,	Leg	Ear infection	Legs are burned and the powder is applied locally.
12	<i>Pterocarpus giganteus</i> (Chiroptera) 'Badudi'	Meat	Asthma and bronchitis	Prepared meat is given to the patient.
13	<i>Sus scorofacristatus</i> Wagner (Mammalia) 'Barha'	Teeth	Inflammatory pain	Teeth's are washed in water and is drunk twice a day for seven days.

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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