

## Zootherapeutical Uses of Animal Diversity in Coastal District of Orissa, India

<sup>1</sup>N. Mishra and <sup>2</sup>T. Panda

<sup>1</sup>Department of Zoology, Chandbali College, Chandbali, Bhadrak -756133, Orissa, India

<sup>2</sup>Department of Botany, S.N. College, Rajkanika, Kendrapara - 754220, Orissa, India

**Abstract:** The present study documents zootherapeutic practices in Kendrapara 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 animal parts, viz. blood, excreta, feather and horn were used in raw or cooked forms for the treatment of piles, asthma, skin diseases, dysentery and rheumatism. These zootherapeutical resources were used for the cure of 11 illnesses. This research will hopefully help in monitoring and management of ethnomedicinal animals and highlights their importance in maintaining ecosystem services which could be a valuable tool for better understanding the long-term effects of traditional knowledge in Kendrapara district of Orissa, India.

**Key words:** Ethnomedicine, ethnozology, Orissa, 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. Many plant and animal 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. Plants and animals have been used as medicinal sources since ancient times (Alves and Rosa, 2005; Alves and Rosa, 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; Alves and Rosa, 2006; Philipson

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 much less studied than medicinal plants in the country (Mahata, 2002; Negi and Payal, 2007; Prabhakar and Roy, 2009; Roy and Singh, 2007). In this context, some of the uses of wild animals by people of Kendrapara district of Orissa are not known outside their restricted communities. Kendrapara, one of the coastal district of Orissa, eastern India, harbors a rich diversity of ethnozological species, which generate considerable benefits from social and economic perspectives. Until now, people are preparing medicines from their available species of animals which are used to treat common diseases. Although ethnomedicinal uses of plants in Kendrapara district has been studied by some workers (Panda, 2010; Pattanaik *et al.*, 2008), but in spite of the availability of ethnomedicinal animals in and around different blocks of the said district, they have not been studied ethnozologically. The neglect of traditional food and medicines may seriously deteriorate the health and well being of traditional peoples (Begossi, 1998; Pieroni *et al.*, 2002). Furthermore, nature-based traditional food and medicine are generally viewed as interchangeable, 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 has been designed to report the ethnozoological uses of animals to treat common diseases on the basis of field surveys and taxonomic identification of animals. The objective of this study is to motivate the people to come forward for the utilization, cultivation and preservation of traditional animals. 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.

### MATERIALS AND METHODS

Study area: Bhitarkanika National Park (20°17' - 20° 47' N and 86°45' - 87°17' E) in Orissa is one of the major reserve forests and fall in a total area of 145 km<sup>2</sup> along the maritime boundaries of the district Kendrapara and Bhadrak. It is surrounded by six Gram Panchayats having 410 villages with a population of about two lakhs. 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 37°C in summer to 13°C in winter with an average annual rainfall of about 130 cm. 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 animals.

In villages in and around Bhitarkanika National Park Zotherapy (treatment with medicines from animal 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 2008 to June 2010 in different villages around the National Park 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. Forty three (34 men and 09 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. 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, 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 animal 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 animals, which were further authenticated by crosschecking. In addition to crosschecking and recording folk names of animals 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. 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 and their ethno zoological 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 eighteen animal species were used for medicine purposes in the surveyed area. The inventoried species comprise six taxonomic categories: mammals (5), reptiles (2), aves (4), Arthropod (2), Annelida (1), Amphibian (1), Pisces (2) and Molluscs (1). The medicinal animal parts, feathers, horns, bile, oil, blood and flesh were used in raw or cooked forms (Table 1). These species were used to treat 11 different

Table 1: Ethnozoological inventory in and around Bhitarkanika National Park

Zoological name, authors, family/order and local name	Parts used	Diseases	Mode of application
<i>Axis axis axis</i> Simpson (Cervidae) 'Harina'	Horn	Dysentery	The horns were properly grinded and taken orally in small amount.
<i>Buceros bicornis</i> Linn (Bucerotidae) 'Kuchilakhai'	Oil	Rheumatism	Oil is heated and applied locally.
<i>Capra aegagrus hircus</i> Passang (Bovidae) 'Chheli'	Leg	Gout	Curry of goat leg was taken orally for three days.
<i>Cervus unicolor</i> Kerr. (Mammalia) 'Sambar'	Blood	Chronic dysentery	Dry blood is mixed with sugar and administered for 3 days.
<i>Cimex lactularicas</i> Linn (Cimicidae) 'Chharpoka'	Whole body	Piles	The whole body of the animal was inserted in to the ripen banana and taken orally.
<i>Cheloni mydas</i> Linn (Cheloniidae) 'Kainchha'	Meat	Asthma	The meat was extracted from the animal and curry was prepared and taken orally.
<i>Crocodylus palustris</i> Lesson (Crocodylidae) 'Kumbhira'	Excreta	Skin diseases	Little quantity excreta mixed with coconut oil and applied locally.
<i>Pheretima posthuma</i> Kinberg (Haplotaxida) 'Jia'	Whole body	Rheumatism	The whole body of the animal (1-2) was grinded properly and taken orally in small amount.
<i>Gagata cenia</i> Hamilton (Sisoridae) 'Kantia Machha'	Oil	Treatment of burns	The oil is extracted from the animal and applied over the burns.
<i>Gallus domesticus</i> Linn (Phasianidae) 'Kukuda'	Egg	Cardiovascular	Burnt egg was given orally for heart patients.
<i>Gallus gallus murghi</i> Linn (Phasianidae) 'Bana Kukuda'	Flesh	Dysentery	Fresh flesh curry was taken orally.
<i>Herpestes fuscus</i> Waterhouse (Herpestidae) 'Neula'	Whole body	Asthma	The animal was killed and the whole body was dipped in 300 ml curd and allowed to decompose and taken 10 ml orally once a day for 10-15 days.
<i>Manis crassica</i> Gray (Manidae) 'Bajrakapta'	Feather	Piles	The ring is made up from the feather and tied on finger.
<i>Labeo rohita</i> Ham (Cyprinidae) 'Rohi Machha'	Bile	Piles	Bile juice was taken orally in very small amount (0.1 to 0.3 mg).
<i>Pila globosa</i> Swainson (Piliidae) 'Genda'	Flesh	Anemia	Flesh was extracted from the creature and the curry was taken.
<i>Periplanata americana</i> Linn (Blattellidae) 'Asarapa'	Excreta	Bronchitis	Excreta of cockroach with sugar was taken for 3 days.
<i>Pterocarpus giganteus</i> Jacq (Chiroptera) 'Badudi'	Meat	Asthma and bronchitis	Prepared meat is given to the patient.
<i>Bufo merimus</i> Linn (Ranidae) 'Luni Benga'	Blood	Fever	Frog blood was taken (2-5 times) and given in dips (5-7 dips) to the children aged 12 years.

diseases. The most cited diseases were: piles, asthma, dysentery, skin 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. 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 (Mishra *et al.*, 2011). It is known that the use of medicinal animals is frequent in several countries (Alves *et al.*, 2007; Alves and Rosa, 2008; Alves *et al.*, 2009) and that often there are overlaps in the medicinal use of plants and animals in traditional medicine for humans (Alves *et al.*, 2007; Alves *et al.*, 2009). Consequently it is assumed that there is a close association between

phytotherapeutic 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 Kendrapara district influences the choice of medicinal animals' usage. 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.

## CONCLUSION

Our results demonstrated the persistence of folk medicine practices in Kendrapara area, that the local 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 Kendrapara region, where the studies concerning this subject are scarce. 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. This research will hopefully help in improving monitoring and management of ethnomedicinal animals and highlights their importance in maintaining ecosystem services which could be a valuable tool for better understanding the long-term effects of traditional knowledge in Kendrapara district of Orissa, India.

#### ACKNOWLEDGMENT

The co-operation rendered by various ethnic groups in providing first hand information regarding the uses of animals is highly acknowledged. Author also thankful to the management of Maxwell Scientific Organization for financing the manuscript publication.

#### REFERENCES

- Adeola, M.O., 1992. Importance of wild animals and their parts in the culture, religious festivals and traditional medicine, of Nigeria. *Environ. Conserve.*, 19(2): 125-134.
- Alves, R.R.N. and I.L. Rosa, 2005. Why study the use of animal products in traditional medicine? *J. Ethnobiol. Ethnomed.*, 1:1-5.
- Alves, R.R.N. and I.L. Rosa, 2006. From cnidarians to mammals: The use of animals as remedies in fishing communities in NE Brazil. *J. Ethnopharmacol.*, 107: 259-276.
- Alves, R.R.N. and I.L. Rosa, 2007. Biodiversity, traditional medicine and public health: Where do they meet? *J. Ethnobiol. Ethnomed.*, 3: 1-9.
- Alves, R.R.N., I.L. Rosa and G.G. Santana, 2007. The role of animals as complementary medicine in Brazil. *J. Biosci.*, 57: 949-955.
- Alves, R.R.N. and I.L. Rosa, 2008. Use of tucuxi dolphin *Sotalia fluviatilis* for medicinal and magic religious purposes in North of Brazil. *Hum. Ecol.*, 37:443-447.
- Alves, R.R.N., C.C. Silva, R.R.D. Barboza and M.S.W. Souto, 2009. Zootherapy as an alternative therapeutic in South America. *J. Alter. Med. Res.*, 1: 21-47.
- Anyinam, C., 1995. Ecology and Ethnomedicine: Exploring links between current environmental crisis and indigenous medical practices. *Soc. Sci. Med.*, 40(3): 321-329.
- Cunningham, A.B., 2001. Applied ethnobotany, people wild plant use and conservation. Earthscan Publishing Ltd., London and Sterling, VA.
- Begossi, A., 1998. Food Taboos: A Scientific Reason? In: Pendergast, H.D.V., N.D.R. Etkin, P. Harris and Z. Houghton (Eds.), *Plants for Food and Medicine*. Royal Botanic Garden, Kew, UK, pp: 41-461.
- Chivian, E., 1997. Global Environmental Degradation and Biodiversity Loss: Implication for Human Health. In: F. Grifo and J. Rosenthal (Eds.), *Biodiversity and Human Health*. Island Press, Washington DC, pp: 7-38.
- Huntington, H.P., 2000. Using Traditional ecological knowledge in science: Methods and applications. *Ecol. Appl.*, 10(5): 1270-1274.
- Jain, S.K., 1987. *Glimpses of Indian Ethnobotany*. New Delhi: Oxford and IBH Publishing Co.
- Jain, S.K., 1991. *Dictionary of Indian Folk Medicine and Ethnobotany*. Deep Publishers, New Delhi.
- Jain, S.K. and R. R. Rao, 1977. *A handbook of field and Herbarium Methods*. Today and Tomorrows Publishers, New-Delhi.
- Lev, E., 2003. Traditional healing with animals (zootherapy): Medieval to present day Levantine practice. *J. Ethnopharmacol.*, 85: 107-118.
- Mahata, M.C., 2002. Edible shell fish (Molluscs) of Chotanagpur plateau Jharkhand (India). *Biopublications*, pp: 1-133.
- Martin, G.J., 1995. *Ethnobotany*. Chapman and Hall, London.
- Mishra, N., S.D. Rout and T. Panda, 2010. Ethnobotany and medicinal values of simlipal biosphere reserve, Orissa, India. *Afr. J. Phar. Pharmacol.*, 5(1): 6-11.
- Negi, C.S. and V.S. Payal, 2007. Traditional uses of animal and animal products in medicines and rituals by the Shoka tribes of district Pithoragarh, Uttaranchal, India. *Ethnomed.*, 1(1): 47-54.
- Panda, T., 2010. Preliminary study of ethno-medicinal plants used to cure different diseases in coastal district of Orissa, India. *Br. J. Pharm. Toxicol.*, 1(2): 67-71.
- Pattanaik, C., C.S. Reddy and N.K. Dhal, 2008. Phytomedicinal study of coastal sand dune species of Orissa. *Ind. J. Trad. Know.*, 7(2): 263-268.
- Philipson, J.D. and L.A. Anderson, 1989. Ethnopharmacology and western medicine. *J. Ethnopharmacol.*, 25 (1): 61-72.
- Pieroni, A., M.E. Giusti and A. Grazzini, 2002. Animal Remedies in the folk Medicinal Practices of the Lucca and Pistoia Provinces, Central Italy. In: Fleurentin, J., J.M. Pel and G. Mazars (Eds.), *Des Sources Du Savoir Aux Medicaments Du Future/ from the Sources of Knowledge to the Medicines of the Future*. Proceedings of the fourth European Colloquium of Ethnopharmacology, Paris, France, IRD Edn., pp: 371-375.

- Prabhakar, A.K. and S.P. Roy, 2009. Ethnomedicinal uses of some shell fishes by people of Kosi river basin of north Bihar, India. *Ethnomed.*, 3(1): 1-4.
- Prater, S.H., 1981. *The Book of Indian Animals*. Bombay Natural History Society, Bombay.
- Roy, S.P. and B.K. Singh, 2007. Ethnomedicinal uses of Animal Diversity by Tribal People of Santhal Pragana on Jharkhand, India. In: Das, A.P. and A.K. Pandey (Eds.), *Advances in Ethnobotany*. DeheraDun, pp: 211-217.
- Santhya, B., S. Thomas, W. Isabel and R. Shenbagarathi, 2006. Ethnomedicinal plants used by the Valaiyan community of Piranmalai hills (Reserved forest), Tamilnadu, India-Apilot study. *Afr. J. Trad. Cam.*, 3(1): 101-114.
- Sharma, B.D., 2002. *Man and Wildlife Resources Exploitation. Indian Wildlife Threats and Preservation*. Anmol Publications Pvt. Ltd., New Delhi, pp: 208-229.
- Singh, J.S., 2002. The biodiversity crisis. A multifaceted review. *Curr. Sci.*, 82(6): 638.
- Singh, L.A.K., 1998. *Wildlife wealth of Similpal: A glimpse. Similpal. A natural habitat of unique biodiversity*. Orissa Environmental Society, Bhubaneswar, pp: 38-41.
- Sullivan, K. and C.N. Shealy, 1997. *Complete Natural Home Remedies*. Element Books Ltd., Shaftsbury, UK.
- Yineger, H., E. Kelbessa, T. Bekele and E. Lukekal, 2007. Ethnoveterinary medicinal plants at Bale Mountains National Park, Ethiopia. *J. Ethnopharmacol.*, 112: 55-70.