



Medicinal use of amphibians and reptiles by tribal communities in India: A Review

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Abstract

In India from ancestral time animals are used as medicine to cure different human ailments by ethnic communities. However, the present generation attitude toward traditional medicine as being unscientific and acculturation are the main causes of decline of such practices in tribal societies. The present review article describes the traditional knowledge of zootherapy, especially the use of amphibians and reptiles as medicine to cure different human diseases by tribal communities of India. India possesses a total of 427 tribal communities which depends on natural resources for their survival. The present medico-ethnozoological work has been studied from different published research paper of various authors on ethnozoology/zootherapeutic studies in India that provide an idea that many types of diseases are cured by the use of various amphibians and reptiles.

Keywords: zootherapy, ethnomedicine, disease, amphibian, reptiles, tribal community

Introduction

Ethnozoology is a branch of Anthropology which describes the relationship between tribal people of a particular culture and region with animals, their interaction and evolution. It also deals with studies among the tribes and rural people for recording their unique knowledge about animal's wealth and search of new drug of animal origin and conservation of useful and economically important animals. (Prakash and Verma, 2021) [26]. Zootherapy is the use of animals and animal byproducts to heal different human diseases (Costa-Neto, 1999) [10]. Many wild and domestic animals and their byproducts (e. g., skin, bones, blood, meat, hooves, feathers, tusks) used to obtain the essential ingredients for the preparation of protective, preventive and curative medicine. The most important aspect in this context ramifies as traditional mode of treatments of various kinds of ailments using animals and their products in a tribal community (Prakash and Yadav, 2020) [27]. Ethnozoology is divided into number of branches such as ethnoentomology (deals the therapeutic use of insect in human health care), ethnoichthyology (deals the therapeutic use of fishes in human health care), ethnoherpetology (deals the therapeutic use of amphibian and reptiles in human health care) and ethnoornithology (deals the therapeutic use of birds in human health care) (Prakash and Prakash, 2021) [26].

Tribal communities are mainly the forest dwellers who have accumulated a rich knowledge of bioresources over centuries. Bioresources and humans have intimate relationship since past and depending upon each other for existence. Now days, greater emphasis is being laid on the traditional knowledge regarding application of bioresources in the indigenous healing practices by tribal / ethnic people science ancient time (Prakash, 2017) [24].

As the importance of drugs of animal origin is being realized throughout the globe including the developed countries, the medico-ethnozoological studies are getting enhanced attention of the researchers. The medico-ethnozoological system makes extensive uses of large

number of drugs of animal origin. These remedies are beneficial or claimed to be so, in a variety of human ailments. The contemporary society may benefit much from the tribal experience in its fight against disease and sufferings (Azmi, 1989) [1]. India is gifted immense faunal and floral biodiversity, because of the extreme variation in geographical and climatic condition prevailing in the country (Bagde and Jain, 2013) [2]. India has a great faunal diversity accounting about 10% of the reported biological species on the planet and ranks first place in terms of insects (54,600), followed by fishes (2546), aves (1232), reptiles (456), mammals (390) and amphibians (209) (Barah and Prasad, 2017). In India, different tribal and ethnic communities are lived throughout the country. People of these communities have great medicinal knowledge about amphibian and reptiles and their medicinal value, and they also provide considerable information about the use of freshwater fishes and their by-products as medicine. Most of the rural areas, tribal and ethnic people are totally dependent on local traditional medicinal system for their health care because they are living in remote areas where hospital and other modern medicinal facilities are not available, so they use their traditional knowledge for medicinal purpose and this knowledge is passed through oral communication from generation to generation (Jaroli *et al.*, 2010) [15].

In India, a total of 427 tribal and ethnic communities are lived throughout the country (Chandra Prakash Kala, 2005) [7]. People of these communities have great knowledge about indigenous fauna and their medicinal value, and they also provide considerable information about the use of amphibians and reptiles as medicine. Most of the rural areas, tribal and ethnic people are totally dependent on local traditional medicinal system for their health care because they are living in remote areas where hospital and other modern medicinal facilities are not available, so they use their traditional knowledge for medicinal purpose and this knowledge is passed through oral communication from generation to generation (Jaroli *et al.*, 2010) [15].

Ethnomedicinal use of some Amphibians by Tribal communities of India

Traditional medicine is an indispensable part of primary health-care among the tribal communities in India. Traditional health-care practices of these tribal communities are generally based on religious beliefs and therefore, are an important driver for continuation of their culture (Teronpi *et al.*, 2012).

Wild animals are the cheapest way for cure of various health

disorders. Approximately 15 amphibian species are reported to use in the treatment of various disease as traditional medicine by different tribal communities of India. Traditional health care practices among the tribal population in India include oral therapy, contact therapy, by preparing solutions or powders. The scientific name, common name and method of application of amphibians to cure diseases by tribal communities in India is given in the table.

Table 1: List of amphibians used as medicine by tribal communities in different part of India.

Scientific /Common Name	Parts Used	Disease condition	Method of Application/ Consumptions	Reference No.
Frog, <i>Rana tigrina</i>	Flesh	Asthma, Whooping cough, Improve vigour	Cooked fleshed is consumed once daily, for 6 weeks.	[6], [27],
		Wound	Flesh is crushed into a paste and applied over wound for easy healing. Frog boiled in oil is used to heal wounds caused due to burns.	[3], [4]
	Fat	Piles, Eczema	Warmed and applied externally twice daily, for 2 weeks.	[27]
		Paralysis, Rheumatism	Warmed with mixed mustard oil and massaged over joints once daily, till the disease is cured.	[27]
	Bile	Hyperpyrexia (Very High fever)	Applied on forehead twice daily, for 3-4 days.	[27]
	Skin	Burn wound	Fresh skin, skinned and wrapped over affected area, Skin oil is applied on wound	[21], [27]
	Gall Bladder	Asthma	-	[17]
Frog, <i>Rana clamitans</i>	Dried Whole Body	Rheumatism	Raw dried whole body including skin & foot	[31]
Frog, <i>Duttaphrynus melanostictus</i>	Body Part	Tonsil	Flesh is cooked and consumed	[13]
Toad, <i>Buffo</i> sp	Flesh	Eczema	Warty skin is removed and the flesh is boiled with rice-husk and the water is applied on body	[18]
	Bile	Jaundice	4-5 drops of bile diluted in a glass of water and drink in the empty stomach once daily, for 2 weeks.	[27]
	Heart & Blood	Pneumonia	Heart and fresh blood mixed with clove, cardamom, black pepper and make a pest and take orally twice daily, for 2 weeks.	[6], [27]
	Hind legs	Urinary retention, Acne (Pimples)	Thigh muscles is cooked and consumed	[21]
Flying Frog, <i>Rhacophorus</i> sp.	Flesh	Pneumonia, Asthma, Ribs pain	Cooked with light spices like clove, cardamom, black pepper and consumed once daily, for once week.	[27]
	Whole body	Snake-bite	Chopped and wrapped around affected site 3-4 times for one day only.	[27]
	Bile	Hyperpyrexia (High fever)	Applied on forehead twice daily, for 3-4 days.	[27]
Tree frog, <i>Hyla</i> sp.	Whole body	Scorpion-bite	Chopped and wrapped around affected site 3-4 times for one day only.	[27]
Common Tree Frog, <i>Polypedates leucomystas</i>	Flesh	Asthma	Cooked fleshed is consumed once daily, for 6 weeks.	[6]
Liebig's frog/ Sikkim frog, <i>Paa liebigii</i>	Skin	Wound, Burn	A small piece of dried skin is soaked in water and rubbed on stone to obtain a paste, which is then applied to wounds and burn parts	[19]
Liebig's frog, <i>Nanorana liebigii</i>	Whole body	Infertility,	Cooked meat is given orally during infertility.	[29]
		Fever, Measles,	Small piece of dried meat is boiled for 10-15 minutes; the soup obtained is given orally for curing fever and measles.	[29]
		Diarrhea	Dried frog is ground and makes a paste which is given orally for treating diarrhea.	[29]
		Piles,	A small piece of dried meat is put in a glass bottle; fresh calf urine is added and kept for 15-20 days. 3 spoons of the mixture are taken orally twice a day in empty stomach for treating Piles.	[29]

Paha, <i>Paa polunini</i>	Whole Body	Diarrhea & Dysentery	Dried frog is ground to a smooth paste and is given to children	[19]
	Whole Body	Wound, Burn	Dried frog is ground to a smooth paste is used to reduce scare in the skin caused by wounds and burns.	[19]
Frog, <i>Euphlyctis Hexadactylus</i>	Flesh	Sexual stimulant for male	Boiled the flesh and make a decoction and take orally	[31]
Choki/ Frog, <i>Hoplobatrachus tigerinus</i>	Flesh	Impotency	Flesh is taken as food after cooking and it helps to gain strength and overcome impotency	[8]
Frog, <i>Limnonectes limnocharis</i>	Skin, Flesh	Skin Burn, Gastrictis, Tongue Blister, Rheumatism		[11]
Frog, <i>Paludomus conica Parreysia sikkimensis</i>	Whole body	Given to weak person, diabetic patient and fertility enhancement		[11]
Frog, <i>Fejervarya limnocharis</i>	Used as medicine by Tribal people of India.			[20]

The information collected from various literature it is clear that tribal people of different geographical regions in India were used whole body, flesh, skin, heart, blood, bile and fat of more than 15 species of amphibians as drugs for the treatment of asthma, Whooping cough, pneumonia, hyperpyrexia, jaundice, rheumatic-joint pain, piles, skin diseases and infertility etc. (Jamir and Lal, 2005; Dixit *et al*, 2010; Borah and Prasad, 2017; Prakash and Yadav, 2020) [14, 12, 20].

Ethnomedicinal use of some Reptiles by Tribal communities of India

The numbers of species of reptiles used by the ethnic groups are 22. Reptiles are used by the various tribal communities of different geographical region of India. They mostly use the reptiles to treat various human diseases like asthma, Bronchitis, Tuberculosis, pneumonia, arthritis, malaria, piles and skin diseases etc. Mostly used parts are the whole body, flesh, liver and fat etc. (Jamir and Lal, 2005; Dixit *et al*, 2010; Borah and Prasad, 2017; Prakash and Yadav, 2020) [14, 12, 16, 27].

Table 2: List of Reptiles used as medicine by tribal communities in different part of India.

Scientific /Common Name	Parts Used	Disease condition	Method of Application/ Consumptions	Reference No.
Indian Cobra, <i>Naja naja</i> King Cobra, <i>Ophiophagus hannah</i>	Flesh	Asthma, Bronchitis, Tuberculosis burn,	Boiled or cooked with light spices and consumed once daily, for 3 weeks.	[27]
	Fat	Paralysis, Rheumatism, healing of fracture bones Loss of erectile power	Warmed and massaged twice daily on affected area/ joints/ phallus, for about 8 weeks.	[11], [14], [27],
	Gall Bladder	Tonsil, Snake bite, Diabetes	Raw gall bladder/ Bile taken orally once daily, for 3 days.	[5], [27]
	Ash of slough	Cancer	Ash of slough is used orally	[3]
		Leprosy	Ash of slough mixed with coconut oil and applied on leprosy wound for rapid healing.	[3]
Skin (with egg shell)	Harpies		[17]	
Viper, <i>Echis coloratus / Vipera susselli</i>	Flesh	Golactoschesia,	Cooked with light spices and given to the lactating women once daily, for 2 weeks	[27]
		Eyesight	The meat believed to promote eyesight and facilitates to elimination of wine, stool and flatus.	[22]
	Fat	Paralysis, Joint Pain, Impotency, Inguinal hernia,	Warmed and massaged twice daily on affected area/ phallus, for about 8 weeks.	[21], [27] [30]
	Bile	Warts; Malaria fever	Fatty oil Body oil	[11]
Rat snake, <i>Ptyas mucosus</i> (Linnaeus)	Flesh	Pain or Body ache	Cooked with light spices and eaten once daily	[27]
	Scale	Loss of sexual vigour, Menstrual irregularity	Incinerated powder with honey once daily, for 4 weeks.	[27]
	Fat	Paralysis, Sciatica, Impotency	Warmed and massaged twice daily on affected area/ phallus, for about 8 weeks.	[27]
	Vertebrae	Goiter	Making charm and tide around neck.	[2]

Python, <i>Python malurius</i> (Linnaeus)	Flesh	Rheumatism, Asthma	Boiled with salt and soup taken once a week, till the disease is cured.	[27]
		Galactoschesia	Cooked with light spices and given to the lactating women once daily, for 2 weeks.	[14], [27],
	Liver	Night blindness, Conjunctivities	Dried powder with water taken orally once daily, till the disease is cured.	[27]
	Bile	Gastric Problem	Fresh or dried bile taken orally	[9], [11]
	Fat	Vitiligo, Wound, Abscess, Leprosy Joint Pain, Piles	Warmed fat applied externally once daily, till the disease is cured.	[11], [27], [28]
Rattle snake, <i>Crotalus durissus</i>	Fat	Arthritis, Alleviate tremor	Raw fat is used	[21], [30]
Snake, <i>Hydrophis</i> sp.	Liver	Diarrhoea, Dysentery, Malaria, Typhoid		[11]
Indian Mabuya, <i>Eutropis carinata</i> (Schneider)	Flesh	Snake bite and pain	Boiled with salt and soup taken orally	[27]
	Whole body	Loss of erectile power Tachycardia	Cooked and consumed once a week, for 4 weeks.	[27]
Indian wall lizard, <i>Hemidactylus</i> sp. (Ruppell)	Flesh	Act as Pain killer	Flesh is inserted in banana and eats orally twice daily.	[27]
	Whole body	Alopecia, wound	Fried in mustard oil, extract is applied over affected sites twice daily, till the disease is cured.	[27]
Indian spiny-tailed lizards, <i>Uromastix</i> sp.,	Fat	Dandruff, Baldness, Eczema, Ringworm,	Warmed and applied on head once daily, for 1-4 weeks.	[27]
		Pneumonia	Warmed and massaged on chest twice daily, for one week.	[27]
		Impotency	Rubbed the oil extract on lumbo-sacral region once daily, for 5 weeks.	[27]
Monitor lizard, <i>Varanus</i> sp. (Merrem)	Flesh	Skin diseases (Ring worm), Jaundice	Boiled the flesh with salt and take orally once daily, for one week.	[11], [27]
		Joint & Back Pain		[17]
		Cough & Fever		[11]
	Skin oil	Arthritis ‘	Massaged with Skin oil at joints	[11], [21]
		Piles	Applied on anus	[11]
	Penis & Testis	Male Sex Stimulant	Penis and Testis are eaten raw	[21]
Tongue, Meat, bile, Skeleton	Asthma, Malaria, Arthritis, Stammering	-	[11]	
Lizard, <i>Tropidurus torquatus</i>	Whole body	Chicken pox, Rheumatism	Fried Skin Oil is used on wound	[21]
Garden Lizard <i>Calotes</i> sp.	Flesh	Pneumonia, Asthma, Cough	Dried Roasted meat	[11]
Lizard, <i>Tropidurus torquatus</i>	Whole body	Chicken pox	-	[30]
Chameleon, <i>Chameleon zeylanicus</i>	Tail	Elephantiasis	Bound around leg to cure this problem.	[3]
Tortoise & Turtles <i>Testudo</i> sp.	Flesh	Rickets, Asthma, Tuberculosis.	Cooked without spices and consumed once daily, for 2 weeks.	[27]
	Fat	Piles/ Paralysis, Rheumatism, Skin disease, Piles	Warmed and applied / massaged daily, till the disease is cured.	[16] [27]
	Shell	Piles	Powdered shell mixed with water and the paste is applied on piles.	[3]
	Blood	Erysipelas, Piles	Raw blood is consumed	[21], [30]
Star Tortoise, <i>Geochelone</i>	Fluid	Piles	Fluid commonly out from neck	[11]

<i>Elongate</i>				
Turtle, <i>Chilonia</i> sp.	Flesh	Piles	Ash of the flesh applied in affected area	[23]
		Skin Disease	Cooked and eaten	[23]
Turtle, <i>Kachuga tentoria</i>	Hard shell	Skin Burn	Ash of carapace mixed with coconut oil and applied on infected part.	[22]
Turtle, <i>Tehanochelys trijuga</i>	Flesh, Bile	Malaria	Fried meat with light spices and fresh bile	[11]
Indian pond terrapin, <i>Melanochelys trijuga</i>	Flesh	Allergy	-	[5], [11]
<i>Chrysenys formasanus</i>	Shell	Skin diseases	Ash of carapace applied on infected area	[28]
Tokay gecko, <i>Gekko gekko</i>	Flesh	Impotency	Flesh with light spices	[5]

Conclusion

It has been seen that the practice of zoo therapy between tribal communities of India is very common like other countries of world and they believes in sustainable use of natural resources but with the interference of modern man in consumption of animal origin drugs has led to large scale killing of some rare and endangered wild life species threatening their extension. From the observations on the zoo therapy practiced by the ethnic groups of India, it can be concluded that the most commonly treated diseases are- Tuberculosis, Diabetes, Asthma, Cancer, Gallbladder stone, Kidney problem, Arthritis, Impotency, skin diseases and Malaria etc. However with the advancement in modern medical science, and the attitude of young generation toward traditional medicine becomes decreases but many tribal people around the world still prefer to go for traditional medicine to treat different human diseases, which primarily is based on their knowledge and experience. This knowledge of traditional medicine has been the basis for the development of many potential drugs that are being used in modern medical field (Das *et al*, 2014). Thus, the scientific study of wild and domestic species of animal used as traditional medicine by different tribal communities of India can lead to the development of new potential drugs for many serious diseases of the present time.

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