



## Review on the therapeutic uses of zoological sources found in the state Arunachal Pradesh

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### Abstract

Arunachal Pradesh, a state in India is a rich in biodiversity, home to diverse indigeneous community who have preserve their ancient healing practice, among which animal or animal derived are used in folk medicine by locals. This traditional knowledge is crucial for cultural preservation, future drug development, scientific validation, and conservative strategies.

**Keywords:** Zootherapy, ethnomedicine, traditional medicine, tribal healing practices

### Introduction

Scientific research done in past years had revealed an ever-increasing number of links of biodiversity on human health, not only in terms of food resources, but they also have the ability to cure and treat various types of illness. From centuries plants and animals, or their parts, have been used therapeutically and even today, natural remedies sourced from animals and plants still hold significant values in medical systems worldwide<sup>[1]</sup>. The healing of human ailments by using therapeutics based on medicines obtained from animals or made from animals is known as zootherapy<sup>[2]</sup>.

Animals have been playing a significant role in healing processes, folk rituals, and religious ritual across all five continents. In traditional Chinese Medicine more than 1500 animal species have been recorded to be of some medicinal use. A list of 60 insect species have been used in treatment of various types of disabilities and illnesses in Japan and similarly 24 animal species were identified, whose by-products were used therapeutically by the Tamang people of Nepal. In India, ancient texts of the Ayurveda and Charaka Samhita record the use of animal and animal-derived product in traditional medicine and healing methods, including zootherapy. India is blessed with diverse flora and fauna, different tribal and ethnic communities, a multitude of cultural complexities, because of its variety in geographic and climatic conditions<sup>[1]</sup>.

### Brief about Medicinal practices by using zoological sources

Arunachal Pradesh is a state in the north-eastern part of India. Arunachal Pradesh being a part of eastern Himalaya is one of the highest biodiversity hotspots, lies between 26°28' and 29°30'N latitude and 90°30' and 97°30'E longitude covered by 60% of its area by forest with different kinds of vegetation from tropical to alpine. In some parts of Arunachal Pradesh where literacy rate is low and have limited access to proper medical care and transportation their livelihood totally become dependent on the forest sources, therefore most people holds a traditional knowledge for illness<sup>[1]</sup>.

In addition to that Arunachal Pradesh is not only abundant with flora and fauna but it is also a land of cultural diversity with 26 major tribes and 110 sub-tribes. Many of the people in these tribal communities depend on forest and their

resources for livelihood. Plants and animal from forest are their main means of living and also for their cultural purpose which is ancient tradition<sup>[3]</sup> About 20 types of human health issues including foot and mouth disease of cattle were said to be curable by using animal materials. The diseases said to be treated by animal and animal-derived resources are fevers, body pains and pains of the joints, diarrhoea, tuberculosis, stomach disorders, constipation, malaria, burns, coughs, wounds, typhoid, smallpox, dysentery, jaundice, stomach ache<sup>[1]</sup>. According to the local people, their knowledge of ethno-medicine has been passed on from their elders, i.e. generation to generation by vocal communication, therefore many information about their folk medicines are based on oral interaction. In contrast, religious beliefs and modernization had a major role for the downfall of folk medicine practice<sup>[3]</sup>.

Tribal communities of Arunachal Pradesh use 48% mammalian species and 28% avian species as ethno-medicine, 38% carnivores, 21% ungulates, 15% rodents and 13% primates among mammals, and 30% Passeriformes, 24% Ciconoformes in general and had constituted their ethnomedicine system. Seven body parts namely meat, bone, fat, gall bladder, alimentary canal, penis and horn of the mammals and five body parts *viz.* meat, fat, feather, bone and leg of the birds are used in traditional medicinal system. Different tribal groups have their own unique way to use the body parts of animal and these include raw meat, fat extract, ashes of bone, decoction of certain dried body organs or parts. Animal at the risk of extinction like tiger, bear, deer, hornbill are also used in folk medicine practice. The local people collect all resources from forest through various means such as capturing, hunting, killing, fishing including manual collection<sup>[4]</sup>.

### Therapeutic uses of zoological sources found in Arunachal Pradesh

In Arunachal Pradesh, a diverse range of vertebrate species are traditionally used for medicinal purposes, reflecting an extensive knowledge in ethnozoological, among fishes species such as eel (*anguilla* sp.), catfish (*amblyceps* sp.) and gangetic goonch (*bagarius bagarius*) are commonly used; and their body mucus, bones or fins have anti-inflammatory properties due to which they are used for treatment of burns, stomach ache, etc. The mucus, bone or fins are directly applied in the affected area or smoked or eaten<sup>[1]</sup>.

Amphibians such as frog (*Rana* sp.) are used for wound healing. It is found that the frog skin, mucus of gland secretion promote wound healing process<sup>[6]</sup>

Reptilian species, including the python (*Python molurus*), cobra (*Naja* sp.), are used therapeutically; i.e. the body fats are used for joint massage, fever & cough, the raw meat of cobra are crushed and used to treat foot & mouth disease in cattle, the monitor lizard (*Varanus bengalensis*) meat is used for gastritis and the tortoise (*Testudo* sp.) head is used to cure fractured bone & piles<sup>[1,3]</sup>

Aves species, like hornbills (*Aceros nipalensis*, *Buceros bicornis*, *A. undulatus*, *Anthracoceros albirostris*), i.e. the fats of these birds are used in body massages, help in muscle pain relieve; and Eagle fat & feathers (*Spiclosnis checla*) are used for treatment of burns and sprain and also some tribes use it for treatment of malaria & typhoid<sup>[1,3]</sup>.

Mammals used therapeutically are Mithun (*Bos frontalis*), i.e. the gall bladder and testicle are used for dysentery, fever, and are given to lactating mother for breast pain and for improving secretion of milk. Mole (*Talpa* sp), i.e. the flesh of mole is cooked and consumed to cure tuberculosis; Porcupine's (*Hystrix* sp.) gallbladder, stomach, intestine are used to treat gastritis, diarrhoea and tuberculosis.<sup>[5]</sup> Mongoose (*Herpestes javanicus*), whose body is used as preventive measure for any disease; Dog's (*Canis lupus familiaris*) raw blood are used in treatment of dysentery, diarrhoea. Other like tiger (*Panthera tigris*), clouded leopard (*Neofelis nebulosa*), moon bear (*Ursus thibetanus*) and deer (*Moschus chrysogaster*, *M. moschiferus*) mammals' gall bladder & bone marrow are used to treat multiple illnesses like malaria, diarrhoea, fever, upset stomach, immunity booster, tuberculosis, jaundice and body pain and Bat (*Cynopterus sphinx*) flesh are used to treat fatty liver and liver pain & improve eyesight<sup>[1,3]</sup>

The preparation method are following any fixed procedure, rather they change from boiling and smoking to ash form and decoction. It has been seen for oral consumption that the method used are drying, boiling, roasting; and for topical application it is either turned into ash form and then crushed or raw paste, i.e. these preparation methods are guided by inherited indigenous people as adopted from their ancestors.<sup>[1]</sup>

### Conservative and ethical concern

For generations, indigenous communities and traditional healers have used local plant and animal resources for therapeutic purposes in a conservative-based manner, ensuring little to no harm to the population dynamics of the species involved. This minimal impact shows a deep ecological knowledge and ethical relationship with the natural ecosystem. However, the rapid loss of traditional knowledge and modernization raises serious ethical concerns; as many essential drugs, including digitoxin, reserpine, tubocurarine, and ephedrine, were discovered by following leads from traditional medicinal practices<sup>[7]</sup>. Therefore, the documentation and protection of indigenous knowledge is important not only for biodiversity conservation but also for ensuring fair recognition and benefit fairly with the communities that have been passing down this knowledge from generation to generation<sup>[2]</sup>. A major concern is the overexploitation of animal species specially those who are listed as endangered species or vulnerable species as per IUCN red list like tiger, deer, bear, hornbill etc. The depletion of animal's species who hold

therapeutic properties call for an urgent conservative strategy like community awareness for the vulnerable and endangered species, sustainable hunting and promotion of alternatives if possible.<sup>[9]</sup>

### Conclusion

The therapeutic uses of zoological sources hold deep significance in the traditional healing practices of the indigenous communities of Arunachal Pradesh. For many tribal populations in remote areas, where access to modern allopathic medicine is limited, zotherapies are essential part of their healthcare system. These remedies are not just based on the pharmacological value, but also related with deeply rooted cultural beliefs and sentiments of indigenous<sup>[8]</sup>. These traditional healing practices are passed vocally from generation to generation by elders. These practices are going to be lost day by day and need to be documented ethically.

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