

Traditional Knowledge of Zootherapeutics Use by Sumi Tribe of Nagaland, India

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KEYWORDS Aliment. Animal-derived. Ethnomedicine. Indigenous. Therapeutics. Treatments

ABSTRACT The present study is the first report on the traditional knowledge of zootherapeutics practices by Sumi tribe under Zunheboto district of Nagaland, India. Data were collected through semi-structured questionnaire and open interview with informants selected based on their knowledge about the traditional medicine and practices. A total of 10 invertebrates and 30 vertebrates species was listed, where different parts and products of various animals were used for the treatment of different ailments practiced by forefathers and elders till date. The majority of tribal communities with limited access to medical care system are dependent on traditional therapeutic resources since older folks are typically the guardians of such vanishing traditional knowledge and resources. In order to ensure sustainable usages, there is a need to systematically document the efficient use and create conservation strategies in the generation to come.

INTRODUCTION

Different parts and products of various species of both wild and domestic animals are used for the preparation of curative, protective, and preventive remedies for the management of various ailments. Wildlife not only contributes to traditional medicine but also modern medicine, with natural extracts being used by pharmaceutical companies as raw materials for the manufacture of drugs (Yirga et al. 2011). In the developing art of bio-prospecting for pharmaceutical compounds, the exploration of traditional medicine has proven a valuable tool. The traditional knowledge and resources need holistic strategies for safeguarding and managements (Costa-Neto 2005; Betlu 2013; Borah and Prasad 2017; Singh et al. 2023).

Different tribes and ethnic communities inhabiting in India have a rich knowledge about animals and their medicinal value for primary health care needs (Mahawar and Jaroli 2007) clothes and other related services (Hussain and Tynsong 2021). The Naga ancestors lived close to nature and revering nature as God. They relied on the resources directly available in nature (plants and animals) for various purposes such as food, medicine, clothes etc. Throughout human history, people cured their illnesses and improved their health by utilizing various natural materials (Alves and Rosa 2007; Alves et al. 2010). The phenomenon of treating human illness or ailments using animals and their products cannot be denied, whether because of

presumed medicinal value or traditional beliefs. Around the world, 70 to 80 percent rural population depends on traditional medicine for its primary health care (WHO 1993). Practical usage of animal and its products are communicated and popular among the ethnic group (Daolagupu et al. 2021). There is a rich pool of traditional knowledge of zootherapeutics practices among different Naga communities. Still, not much has been explored and there are only a handful of reports by Kakati and Doulo (2002), Jamir and Lal (2005), Kakati et al. (2006), Longkumer et al. (2018), Doulo et al. (2019), Mozhui et al. (2021) and Kezo et al. (2022).

Objectives

To document the fast-eroding traditional knowledge related to the usage and preparation of animals or their parts for medicinal security among the Sumi tribe in Zunheboto District, Nagaland, India.

METHODOLOGY

The study was conducted from April 2021 to April 2022 in various villages of Zunheboto district, Nagaland, India. Zunheboto district lies in between the coordinates of 25°45'32.40" N to 26°15'45.70" N latitude and 94°14'13.18" E to 94°42'21.40" E longitude. It is inhabited by the Sumi tribe with population of 114,014, as per 2011 census. The main dialect spoken is Sümi. The infor-

mants were aged within 40-100 age groups. The data were collected through semi-structured questionnaire and open interview with informants selected based on their knowledge concerning traditional medicine and practices. The local name of the animal used as remedy, treated ailments or diseases, parts of the animal used, methods of preparation and prescription were catalogued. Species were examined through photographs and vernacular names were recorded as cited during interviews.

RESULTS AND DISCUSSION

In the present study, 40 animals species and its parts used for therapeutic purposes were identified. Of the species recorded, the vertebrates constitute the highest medicinal use with 30 species (75%), while invertebrates with 10 species (25%). The mammals have the highest count (52.5%), followed by arthropoda (17.5%), aves (15%), annelid (5%), mollusca (2.5%), pisces (2.5%), amphibians (2.5%) and reptiles (2.5%). Table 1 (invertebrate) and Table 2 (vertebrate) summarize the scientific name of species, English/vernacular name, parts used, treated diseases/ ailments, method of preparation and prescription. The study recorded 68 medicinal uses which can broadly endow to treat 11 major ailments: namely respiratory infections, cardiovascular problems, rheumatic and other pains, gastro-intestinal problems, gynaecological problems, urinary problems, eye and ear related problems, skin related problems, burns and wound healing, general body weakness and other ailments. The respiratory infections comprise of cough, asthma, pneumonia, chest pain, tuberculosis, lung and throat problem and sinus. Cardiovascular problems include blood pressure and related heart diseases. Rheumatic and other pains are associated with bone fracture, sprain, body ache and rheumatism. Gastro-intestinal problems include dysentery, stomach ache and gallstone. Urinary problems include bed wetting, piles and hematuria. Gynaecological problems include pre- and post-partum health and facilitate child delivery. Eye and ear related problems include conjunctivitis, poor eyesight and ear ache. Skin related problems are related to ringworm, measles, boil (furuncles) and warts. General body weakness includes fatigue. There are other ailments as fever, childhood apraxia of speech, blood clot and tooth ache were also recorded. The highest animal species used per cate-

gory falls under respiratory infections (17) while the least category is in gynaecological problems and general body weakness (2 each).

In other Naga tribes, the use of mammals was also recorded as highest by workers like Kakati and Doulo (2002) and Kakati et al. (2006). The other Naga tribes also use to treat the same ailments with same fauna such as *Apis indica*, *Apis florea*, *Myrmeleon immaculatus*, *Eisenia fetida*, *Pila globosa*, *Monopterus cuchia*, *Monopterus albus*, *Limnonectes limnocharis*, *Python reticulatus*, *Aquila* sp., *Gallus* sp., *Upupa epops*, *Gazelle benettii*, *Selenarctos* spp., *Funambulus* spp., *Myotis* sp., *Hystrix* spp., *Capra sibirica*, *Macaca assamensis*, *Cervulus* spp. and *Homo sapiens* (Kakati and Doulo 2002; Jamir and Lal 2005; Kakati et al. 2006; Longkumer et al. 2018; Doulo et al. 2019; Mozhui et al. 2021).

It is found that the same fauna is also used to treat different ailments by other tribal communities of Nagaland such as *Hirudo medicinalis*, *Cancer pararus*, *Pediculus* sp., *Gallus* spp., *Corrus splenden*, *Cervulus* spp., *Rattus* sp., *Herpestes* sp., *Selenarctos* spp., *Myotis* sp., *Felis catus*, *Canis familiaris*, *Hystrix* spp., *Pteromys* sp., *Panthera tigris* and *Funambulus* spp. (Kakati and Doulo 2002; Jamir and Pal 2005; Kakati et al. 2006; Longkumer et al. 2018; Doulo et al. 2019).

In traditional zootherapeutic values of Sumi tribe, the whole animal body or body parts or products are used which include flesh, fat, stomach, intestine, bile, gallbladder, blood, fetus, bone marrow, urine, droppings, honey, milk, scale, feathers and whiskers. The preparations involved cooking, roasting, making paste or juice which can be consumed raw, orally or topically. The products collected may succumb injury or without injury to animals. The present results revealed the use of human (*H. sapiens*) urine for treating conjunctivitis. Similar treatment was reported by Jamir and Lal (2005) and wound healing (Mahawar and Jaroli 2007). Use of honey (*A. indica* and *A. florea*) for ailments namely, cough, burns, dysentery, hematuria, wound healing, asthma, stomach pain was documented and similar result was reported by Mahawar and Jaroli (2006), Das (2015), Mary and Yamakanamardi (2019) and Singh et al. (2023). Dried droppings and dried stomach of *Hystrix* spp. used for the treatment of stomach ache, cough and dysentery showed similar findings with Kakati et al. (2006) body weakness, rheumatics, burns, wound

Table 1: List of invertebrate animals and its part used, vernacular names, diseases or ailments and ways the treatment are carried out

S. No.	Class	Scientific name	English name	Vernacular name	Part used	Treated diseases/ ailments	Method of preparation & prescription
1	Annelida	<i>Hirudo medicinalis</i>	Leech	Ayive	Live leech	Blood clot	Leeches are allowed to feed on swellings and area where the blood is clotted.
2	Annelida	<i>Eisenia fetida</i>	Red worm	Alapü	Whole body	Pneumonia	The red worm found in the stem of banana tree is eaten raw as a remedy for pneumonia.
3	Arthropoda	<i>Apis indica</i>	Bee	Akhi	Honey	Cough wound, burns	Honey procured from bees cures cough. A spoonful of honey added to warm water. Honey is also applied locally over the wounds or burns.
4	Arthropoda	<i>Apis florea</i>	Little bee	Atiyi	Honey	Cough, dysentery, hematuria	A spoonful of honey added to warm water is taken to treat cough, dysentery and hematuria.
5	Arthropoda	<i>Cancer pararus</i>	Crab	Achuwo	Whole body	Measles	Crab is believed to be a good curative for measles. Soup is made from grinded crab and administered orally, the skin rash due to measles become red and prominent, after few days the measles start disappearing.
6	Arthropoda	<i>Myrmelcon immaculatus</i>	Ant lion	Kashekapü	Whole body	Boil, warts	Body is crushed and applied on the surface of infected area.
7	Arthropoda	<i>Pediculus</i> sp.	woodlouse	Lotilala	Whole body	Skin diseases, ringworm	It is eaten raw or roasted to treat skin diseases and ringworm.
8	Arthropoda	<i>Solenopsis</i> sp.	Red ant	Satughupu	Whole body	Fever	Red ant is believed to be a good curative for fever. It is boiled and taken orally or the water procured from boiling is used for bathing for quick recovery.
9	Arthropoda	<i>Platypus cylindrus</i>	Oak pinhole borer	Aphisikhulo	Larvae	Dysentery	The larvae are roasted and eaten as a curative for dysentery.
10	Mollusca	<i>Pila globosa</i>	Snail	Chokibo/anhaqu	Whole body	Whole body	Poor eyesight The snail is coo- ked and the soup is consumed to achieve clear eyesight/treat poor eyes.

Table 2: List of vertebrate animals and its part used, vernacular names, diseases or ailments and ways the treatment are carried out

S. No.	Class	Scientific name	English name	Vernacular name	Part used	Treated diseases/ ailments	Method of preparation & prescription
1	Pisces	<i>Monopterus albus</i> , <i>Monopterus albus</i> , <i>Limnonectes limnorcharis</i>	Eel	Apighikha/ Ajokha	Blood	Low blood pressure	Fresh blood is extracted and orally administered to treat low blood pressure.
2	Amphibian		Frog	Achuyi	whole body	Wound, injury	Flesh of the frog is cooked and consumed along with soup for quick healing of the wound after operation and relieve at times of injury.
3	Reptiles	<i>Python reticulatus</i>	Python	Ayithu	Fats, Gallbladder	Rheumatism, nerve dislocation, body ache, stomachache, piles	Fats are used to massage the body to relieve rheumatism and body ache. It is applied while fixing nerve dislocation and topically applied for piles associated pain. Gall bladder is consumed fresh or dried to ease stomachache.
4	Aves	<i>Upupa epops</i>	Hoopoe	Melitugha	Feather	Gallstone	The feather is roasted and powdered then mixed with water and taken orally to remove gall stone.
5	Aves	<i>Anas platyrhynchos domesticus</i>	Duck	Hasi	Flesh	Body ache, general weakness	Flesh of duck is cooked; both the meat and soup is consumed to get rid of body ache and fatigue.
6	Aves	<i>Gallus spp.</i>	Hen	Avü	Fats	Burns	Fats procured from hens are used as ointment and gently applied onto the burns.
7	Aves	<i>Corvus culminatus</i>	Crow	Agha	Flesh	Chestpain and asthma	The flesh is believed to be a great remedy to relieve chest pain and asthma. The flesh is cooked and the meat along with the soup is consumed.
8	Aves	<i>Aquila sp.</i>	Eagle	Aluqhu	Flesh, feathers	Eye problem and wound healing	The soup of eagle meat treats better eyesight. The cotton-like part of the feather is pasted over an injury for quick healing.
9	Aves	<i>Liocichla phoenicea</i>	Red-faced liocichla	Tichilipu/ meghau/tsutopu	Flesh	Childhood apraxia of speech	The flesh is cooked and the meat with soup is administered to children suffering from apraxia of speech or delayed onset of first words.

Table 2: Contd...

S. No.	Class	Scientific name	English name	Vernacular name	Part used	Treated diseases/ ailments	Method of preparation & prescription
10	Mammal	<i>Felis catus</i>	Cat	Akhosa	Flesh	Tuberculosis	Flesh is cooked, the soup and meat is taken to treat tuberculosis.
11	Mammal	<i>Canis familiaris</i>	Dog	Atsü	Flesh	Blood pressure, general weakness	The soup is taken by pregnant women to maintain blood pressure, improve pre- and post- partum health.
12	Mammal	<i>Gazelle bennettii</i>	Antelope	Achuyi	Bone marrow, horn	Bone fracture, sprain, nerve problem, blood purification	Bone marrow is extracted and massaged over the fractured bones, applied locally for sprain and nerve problems. The horn is retrieved and kept for sucking out bad blood
13	Mammal	<i>Cervulus</i> spp.	Deer	Ashe	Urine, fetus	Ear ache, labor	Urine is used as eardrops. Fetus is dried, then cooked and administered to women in aid for healthy child delivery
14	Mammal	<i>Hystrix</i> spp.	Porcupine	Achequ	Dried droppings, stomach along with its content	Stomach ache, cough, Dysentery	The dried droppings are collected, either roasted or boiled and taken orally to treat cough and stomach ache. The stomach along with its content is dried, a slice is boiled and taken orally to cure dysentery
15	Mammal	<i>Funambulus</i> spp.	Squirrel	Akili	Flesh	Sinus and cough	Flesh of squirrel is believed to be great cure for cough and sinus. The flesh is cooked, both soup and meat are consumed
16	Mammal	<i>Pteromys</i> sp.	Flying squirrel	Asughi	Flesh	Tuberculosis	The flesh of flying squirrel is believed to be a good remedy for tuberculosis. It is cooked and consumed along with its soup

Table 2: Contd.,

S. No.	Class	Scientific name	English name	Vernacular name	Part used	Treated diseases/ ailments	Method of preparation & prescription
17	Mammal	<i>Petauristapetaurista</i>	Red giant flying squirrel	Atulo	Flesh, intestine along with its content	Cough, hematuria, piles	The flesh is cooked and consumed with soup to treat cough. The intestine along with its content is consumed as remedy for hematuria and piles.
18	Mammal	<i>Varanus</i> sp.	Water monitor lizard		Achighe	Claw	Throat injury- The leg along with its claw is used to remove fishbone stuck in a throat. The leg is gently rubbed over the throat to dislodge the bone.
19	Mammal	<i>Selenarctos</i> spp.	Bear	Ava	Gallbladder	Heart disease, asthma	The gallbladder is dried for long term use, apiece is boiled and taken orally for heart disease and asthma.
20	Mammal	<i>Talpa</i> sp.	Molerat	Ajiphu	Flesh	Cough, asthma	The flesh is cooked, both the soup and meat are consumed to treat cough and asthma which is believed to work wonders.
21	Mammal	<i>Canomysbadius</i>	Bamboo rat	Ajuye	Flesh	Cough, dysentery	The flesh is cooked, the soup and meat is used to treat cough and dysentery.
22	Mammal	<i>Rattus</i> sp.	Rat	Aji	Flesh	Cough, asthma	The flesh is cooked and consumed to treat cough and asthma.
23	Mammal	<i>Myotis</i> sp.	Bat	Ashuqha	Flesh	Bedwetting / nocturnal enuresis	The flesh is roasted and administered to a child or an adult with nocturnal enuresis / bedwetting.
24	Mammal	<i>Nycticeus bengalensis</i>		Slow loris	Akhiyo	Flesh	Cough The flesh is cooked, both meat and soup is consumed to cure cough.
25	Mammal	<i>Macaca assamensis</i>	Monkey	Ashuki	Flesh	Tuberculosis, cough	The flesh is cooked and consumed with soup to treat tuberculosis and cough.

Table 2: Contd.,

S. No.	Class	Scientific name	English name	Vernacular name	Part used	Treated diseases/ ailments	Method of preparation & prescription
26	Mammal	<i>Viverricula indica</i>	Small Indian civet		Akufu	Flesh	Fever The flesh is cooked and consumed with soup to treat fever.
27	Mammal	<i>Capra sibirica</i>	Goat	Ane	Milk	Fatigue, general weakness	Fresh milk is taken as energy drink.
28	Mammal	<i>Herpestes</i> sp.	Mongoose	Akhetsu	Flesh	Lung and heart complication	The flesh is cooked and consumed by drunkards with lung and heart complication from unhealthy drinking habits.
29	Mammal	<i>Panthera tigris</i>	Tiger	Angushuu	Whiskers	Toothache	The whiskers when used as toothpick is said to cure toothache.
30	Mammal	<i>Homo sapiens</i>	Human being	Timi	Urine	conjunctivitis	The urine is used as an eye drops for conjunctivitis / eye infection.

healing, bone fracture, cholera (Jamir and Lal 2005) malaria (Jugli et al. 2020). *Selenarctos* spp. gall bladder was used for asthma and heart diseases exhibited similar findings with Kakati and Doulo (2002), Kakati et al. (2006) and Jugli et al. (2020). *Cervulus* spp. urine was used to treat earache (Das 2015) and facilitating labor. *C. sibirica* milk used to get rid of fatigue and general weakness having comparable findings with Dixit et al. (2010), Jamir and Lal (2005), Mahawar and Jaroli (2007) and Mary and Yamakanamardi (2019). *M. assamensis* used for tuberculosis and cough with comparable result was reported by Kakati et al. (2006), Betlu (2013) and Das (2015). *Myotis* sp. treat bed wetting or sleep enuresis (Ngaomei and Singh 2016). *P. reticulatus* fats was utilized for treating rheumatism, nerve dislocation and body ache with similar result reported by Chakravorty et al. (2011) and Betlu (2013). *L. limnorcharis* is used for wound healing and injury with similarly result by Jamir and Lal (2005), Chakravorty et al. (2011) and Das (2015). *Pteromys* sp. treat tuberculosis however the urine is also used for treating urethritis (Jugli et al. 2020), constipation and flesh for cough (Kakati and Doulo 2002) and act as antidote (Jamir and Lal 2005). *C. culminatus* is utilized for the treatment of asthma and chest pain however it was also used to treat cough (Dixit et al. 2010), upset stomach (Chakravorty et al. 2011) and as health tonic (Betlu 2013). *U. epops* flesh used as a tool for removal of gall stone with alike result reported in Assam (Betlu 2013). *C. parvus* treat measles yet employed to treat urethritis, malaria, cough and earache (Kakati and Doulo 2002), jaundice (Betlu 2013) and asthma (Das 2015). *P. globosa* was used for treating poor eyesight with similar treatment reported by Borah and Prasad (2017). The blood of *M. cuchia* and *M. albus* revealed in treating low blood pressure which also used in treating asthma and general weakness (Kakati et al. 2006) and anemia (Borah and Prasad 2017). The usage of faunal in the form as traditional medicine has closely knitted with the early generation and today gradually had led to pondering on conservation biology, public health policies, sustainable management of natural resources, biological prospection, and patents (Alves and Rosa 2005). Verma et al. (2014) proposed the significance use of fauna resources in traditional medicines needs scientific approaches for its conservation and mitigation.

CONCLUSION

The present study highlights a vast store of medicinal knowledge use by Sumi tribe of Zunheboto district, Nagaland, India. The majority of tribal communities have limited access to modern medical health care facilities and is solely dependent on traditional therapeutic resources. Since older folks are typically the guardians of such traditional knowledge and resources, due to modernization, the indigenous knowledge that has passed on from generation to generation is fast fading and with the younger generation paying little heed to explore, if not intervened with solution, it will be completely lost. Apart from documentation and transferring the knowledge, there is also a need for better conservation planning to control the hunting of threatened animals that is used in practice and how the resources can be used efficiently assuring that the animal continues to thrive within the biodiversity of the region.

RECOMMENDATIONS

There is a need to explore and document the therapeutic knowledge of flora and fauna which are practices by tribal communities. Also, scientific research approach should supplement to check the abundance and availability of the flora and fauna utilization for future aspects as well as the need to educate the upcoming generation about the knowledge which can be passed on and assuring its sustainable usage.

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Paper received for publication in Septembwe, 2023
Paper accepted for publication in March, 2025