



Ethnozoological study of animal based medicines used by traditional healers from south eastern area of Golaghat district, Assam

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Abstract

Animals have played an important role in human life from ancient times. The knowledge on the use of many animals and their by-products in traditional medicines by various ethnic communities is generally passed verbally from one generation to the next. The present study was carried out on ethnozoological survey of animal based medicines used by traditional healers from south eastern area of Golaghat District, Assam. A total six communities viz., Koch, Kalita, Chutia, Ahom, Nath and Mising have been chosen based on semi-structured questionnaire through interactive personal interview and group discussion on the use of traditional animal based medicines by these local people for the treatment of various diseases. During the survey around 200 respondents were interviewed including 30 traditional practitioners. A total 40 distinct species were identified along with the formulations they utilize to cure various ailments. The study showed that the use of traditional medicines are still popular in rural areas which may depict a scenario of their strong belief on their formulations or may be due to inaccessibility of health care facilities in availing modern medicines. It is evident that the ethnozoological information regarding the therapeutic uses of different animals in traditional medicine is fading and there is an urgent need for its documentation before much of it is completely lost..

Keywords: Ethnozoology, Golaghat, traditional practitioners, zootherapy

Humans have depended on nature for their basic requirements such as food, clothing and shelter besides medicine since the beginning of time, when civilisation first began to spread and settle (Lohani *et al.*, 2008). Traditional or folk medicine is the use of plants, animals and their by-products for the treatment of various diseases by indigenous people of various ethnic communities

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from generation to generation, and it varies greatly from country to country and region to region due to influences such as regional biodiversity, lifestyles, culture, history, individual attitudes and philosophical beliefs (Hazarika and Raju, 2019; Verma *et al.*, 2014; WHO, 2013; Alves and Rosa, 2005). Traditional medicines are the major source of therapy for around 70-80 per cent of the world's rural population, and are more prominent in developing countries (60-90%) than in developed nations (23-80%). The World Health Organization has identified 252 important chemical compounds from plants and animals, accounting for 11.1 per cent and 8.7 per cent, respectively. This suggests that traditional plant-based treatments are more common than animal-based cures. However, people from many tribes across the world, have a wealth of knowledge about animals and their medicinal value (Adeola, 1992). Zootherapy is an important alternative therapeutic option among the numerous well-known therapies and is the practice of employing animals and their parts such as skin, feathers, hooves, blood, bones, tusks and meat as traditional medicines.

India is home to several ethnic and indigenous communities, as well as a diverse range of animal and plant life. Many tribal and ethnic communities have extensive knowledge of the therapeutic significance of animals. There have been accounts of animals being used to cure a range of medical ailments in many parts of India, which includes 270 formulas derived from around 109 species. Mammals constitutes the highest percentage (40%) followed by invertebrates (22%), birds (17%), reptiles (11%), fish (8%) and amphibians (2%) (Verma *et al.*, 2014). In addition to India's great historical texts such as Susruta's Ayurveda and Charaka Samhita, several scholars have reported on the use of zootherapeutic drugs in diverse Indian tribal communities. In Chattisgarh, several common disorders are treated with the excreta of ten animals (Oudhia, 2003). Similar to this, 34 animal species were listed by Gupta *et al.* (2003) in their description of the traditional knowledge of local communities in district Kachchh, Gujarat. In Tamil Nadu, sixteen animal species were reported to treat a variety of ailments from nine tribes spread over four districts (Ranjit Singh and Padmalatha, 2004).

The Maharashtrian tribes of Bhils, Gamits, Kokans, and Pawaras were also discovered to have employed fifteen different animal species byproducts as medicine (Patil, 2003).

North-East India is distinguished for its ethnic, cultural and biological diversity across eight states. Out of the 427 tribal groups reported from India, the North-East region is inhabited by a total of 130 major tribal communities (Medhi and Chakrabarti, 2009). However, the use of traditional animal-based medicines from different tribal communities of North-East India is documented in few reports. Kakati *et al.* (2006) reported zoo-therapeutic data on Ao tribe of Nagaland, and identified 25 different vertebrate species used in conventional medicine. In Arunachal Pradesh, two tribal groups, the Nyisi of East Kameng and the Galo of West Siang, have recently been reported to use about 81 species of edible and therapeutic insects and 36 vertebrate species in the treatment of ailments and diseases (Chakravorty *et al.*, 2011). Turnia and Prasad (2017) studied the zootherapeutic practices among the native Khasi tribes of Meghalaya. Betlu and Lalduhawma (2013) reported 34 different faunal species utilized by indigenous people of Biatae tribe in Dima Hasao, Assam. Assam's native people living in the adjoining the areas of Pobitora wildlife sanctuary, employ different animal species to treat a variety of health diseases (Borah and Prasad, 2016).

Golaghat is an administrative district and a biodiversity rich area in the state of Assam inhabited by many tribal communities. The current study compiles information on traditional medicinal practices by the communities from five villages in the south-eastern part of the Golaghat district, viz. Jamuguri, Kasomari, Garigaon, Nugura gaon, and Tamuli gaon, as there is no data on the ethnozoological practices of these villagers.

Materials and methods

Study area

The study was conducted from March to August 2021 and field data sampling was collected through cross sectional survey across six communities in five villages from South

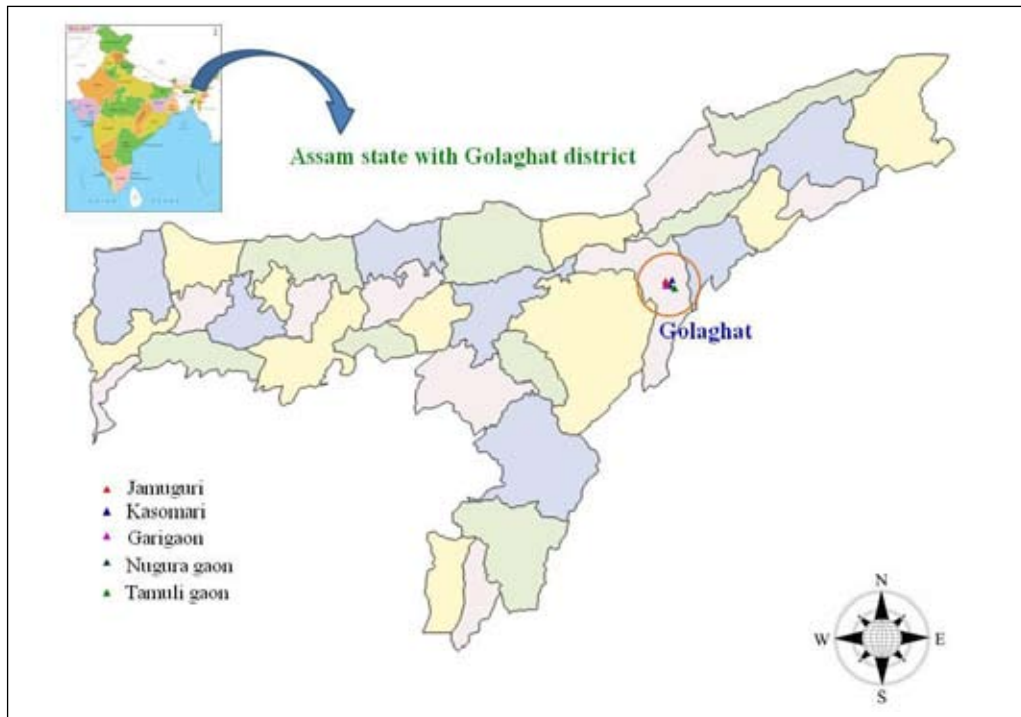


Fig 1: Map of the study area villages in Golaghat district, Assam

eastern area of Golaghat district, Assam (Fig. 1). Information was gathered from interviews held with 200 respondents including 30 traditional practitioners from the study area. The respondents and traditional practitioners were mainly selected on the basis of their experience and well recognition as a knowledgeable old aged person in their villages. The following methods were employed in the collection of data.

Personal interview

The ethnozoological data regarding the use of animals and the products were collected through semi-structured questionnaires. The questionnaire included the following questions in a number of areas that were significant to the study and was designed to cover the animal species used in medicine, preparations and techniques and usable parts. Around 200 people were interviewed personally including aged men, women and traditional practitioners and the information was gathered in their regional language to familiar with the respondents. The given information was repeatedly re-checked during the interviews for authentic data.

The questionnaire:

- For what kind/ types of disease the animal based medicines are used?
- Which parts of the animals are used?
- Preparation method and mode of administration.
- Are the doses for children, adolescents, and adults the same or different?
- How frequently the dose is taken and how long the animal formulation has been administered in the treatment?

Group discussion

A focused group of people who share similar background knowledge and experiences take part in group discussion and reflect upon the issues that affect them. Similar group discussions were conducted in all the five villages among different sections of people to have discussion about traditional animal based medicine and their affect on different health ailments. This method was proved to be an excellent in obtaining necessary information in a short period of time.

Documentation of data

All the collected data was documented on the basis of information from the villagers by the above described methods of personal interviews and group discussions. The documentation represents the demographic and ethnozoological information regarding traditional animal based medicine which includes local name of the animals and their scientific and common names, method of preparation and application, parts of the animals used and the prescription of the dosage.

Results and discussion

Demographic information

The demographic data was gathered through personal interviews and group discussions with the inhabitants of the villagers in Golaghat district. During the survey of interaction, the male respondents were higher than that of female respondents, which comprises about 67.5% and 32.5%, were female. Most of the respondents belonged to low level economic society and were illiterate but had strong beliefs on traditional medicine. Many of them were unemployed and engaged in farming and agriculture besides practicing traditional therapy as a part time to serve society. The age of the respondents ranged from 25 to 90 years and the elderly people had more knowledge on traditional medicine, practice and dosage than the younger ones. The respondents were from six ethnic communities viz Koch, Kalita, Chutia, Ahom, Nath and Mising. However the highest number of respondents who gave more information about the traditional medicine were from Koch community (24%) followed by Ahom, Kalita and others. The detailed demographic characteristic information was presented in the table 1.

Ethnozoological result

Number of species

The above study recorded 40 different types of animal species used in preparation of traditional animal based medicine to treat different ailments. Representatives of some commonly used animals and their products in

Table 1: Demographic characteristics of the respondents

Demographic characteristics	Number of respondents	% of distribution
Sex		
Male	135	67.5
Female	65	32.5
Ethnic community		
Koch	48	24
Kalita	33	16.5
Ahom	41	20.5
Chutia	29	14.5
Nath	27	13.5
Mising	22	11
Age of respondents		
25-35	6	3
35-45	17	8.5
45-55	30	15
55-65	37	18.5
65-75	52	26
75-85	48	24
Above 85	10	5

traditional practices by these village people are shown in Fig. 2. These forty different types of animal species are distributed among 8 animal groups, out of which fishes occupy the highest position containing 11 species (27.5%), insect group comprised of 8 species (20%), 6 species were mammals (15%), birds were 5 species (12.5%), annelids, amphibians and reptiles contained 3 species each (7.5%) and gastropod contained 1 species (2.5%) (Fig. 3).

Method of traditional medicine preparation and Route of administration

The result from above group and personal discussion with the village people and traditional practitioners depicted that there were total four modes of preparation in traditional animal based medicine. The most commonly found method of preparation was consuming raw material (37.5%), followed by cooked (25%), boiled (27.5%) and as a fried and paste (10%) (Fig. 4). The study also found that, traditional medicines were administered orally (84%), topically (14%) and nasally (2%), to the patients. Here, the patients have traditionally preferred oral consumption over other forms of consumption (Fig. 5).



Fig 2: Representative photographs during field survey showing some animals being used in traditional practice by the villagers of Golaghat district of Assam. **a.** Walking catfish **b.** Bengal monitor **c.** Climbing perch **d.** Tortoise skin **e.** Honey comb **f.** Interaction and data collection

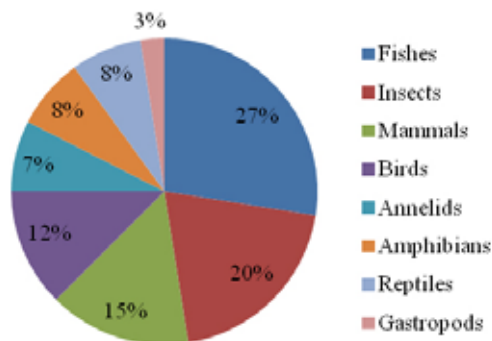


Fig 3: Percentage distribution of number of species

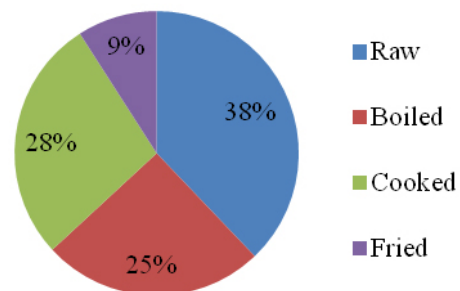


Fig 4: Percentage distribution in medicine preparation method

Parts of animals used as a medicine

From the above study, it was found that the use of raw animal as a whole for medicine preparation occupied the highest position (38%) followed by the by-products like meat (30%), milk, blood and gall bladder each

at 3%, and alimentary canal, head, fats and honey each at 2.5% and skin, larva, tongue comprises 5% respectively (Fig. 6). Table 2 provides an inventory of these animal species with local name, scientific name, common name, by-products, route of administration, treated disease and method of preparation.

From the aforementioned study, 40 different animal species were identified and employed by these people in traditional medicine to cure various diseases like asthma, body pain, pneumonia, jaundice, wound healing and menstrual difficulties, among others (Table 2). However, these animal species preparations were often used in combination with other animal or plant based species for effective treatment, though there were some situations in which a single animal species preparation is employed in treatment of diseases. This type of usage with other species of animals and plant products for better and effective treatment as passed down from one generation to another by tradition based on observation and trails for several years and is sometimes lost with the demise of the elderly knowledgeable person (Soewu, 2008). The respondents were initially hesitant to disclose the location of collecting animal species, but they eventually admitted that they gather the specimens from neighboring forests and nearby locations. It was also noticed that, these traditional medicine preparations had wide acceptance among these villagers especially elder populations (Megido *et al.*, 2014). The aforementioned animal species were

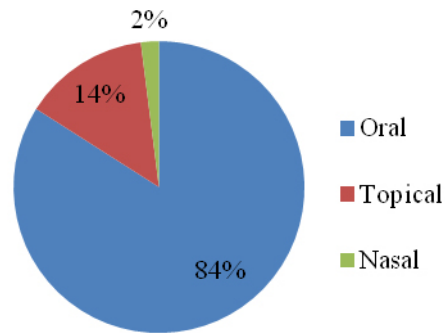


Fig 5: Percentage distribution in route of administration

distributed into 8 taxonomic groups belongs to 32 families made up of both invertebrate and vertebrate species (Table 2). Fishes held the top place among the seven taxonomic groupings (27.5%), followed by insects, mammals, birds, annelids, amphibians, reptiles and gastropods (Fig. 3). The availability of the fishes is more from the nearby Brahmaputra river tributaries like Doyang, Dhansiri and Kakodunga streams etc. Most of these villagers still rely on traditional medicines for their primary health care due to

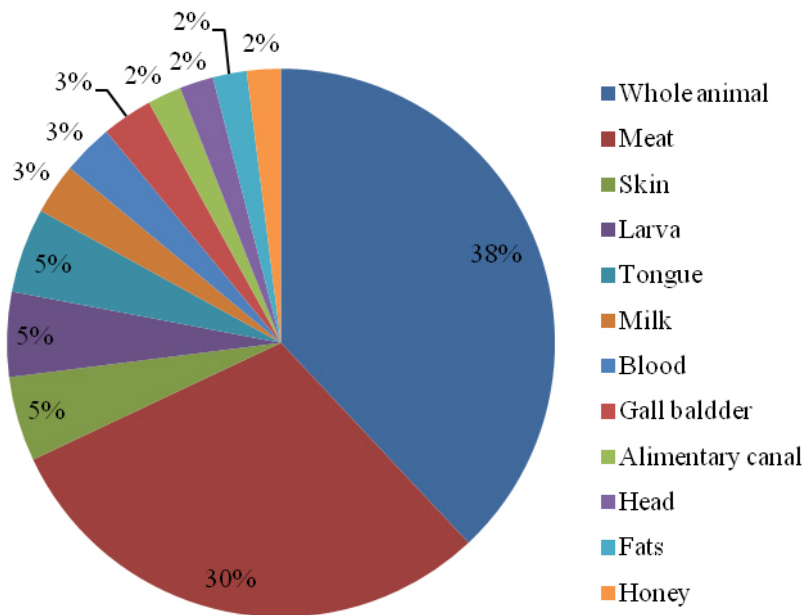


Fig 6: Percentage distribution of parts of animals used

Table 2: Medicinal uses of various taxonomic group of animals with local name, scientific name, common name, family, by-products, route of administration and prescription in traditional therapy

Taxonomic group of animal	Local name	Scientific name	Common name	Family	Animals and their by-products used for medicine	Route of administration	Medicine used for treating disease	Prescription
Insect	Moumakhi	<i>Apis indica</i>	Honey bee	Apidae	Honey	Oral	Cough	Extraction of honey from hive then mixed with Ginger and Tulsi leaves and prescribed to eat
Insect	Noni polu	<i>Bombyx mori</i>	Silkworm	Bombycidae	Larva	Oral	Malnutrition	Raw larva or boiled larva prescribed to eat
Insect	Kumoti	<i>Scapteriscus borellii</i>	Mole cricket	Gryllotalpidae	Alimentary canal	Oral	Intestinal worm especially for Ascaris	Raw alimentary canal mixed with Pineapple plant (<i>Ananascomosus</i>)and prescribed to eat
Insect	Kodu	<i>Vespa affinis</i>	Hornet	Vespidae	Larva	Oral	Cancer	Larva first boiled with black pepper then mixed with honey and prescribed to eat
Insect	Kola paruwa	<i>Myrmecaria brunnea</i>	Weaver ant	Formicidae	Whole body	Oral	Body pain	Raw weaver ant prescribed to eat with hot water at early morning
Insect	Amloriparuwa	<i>Oecphylla spp</i>	Green tea ant	Formicidae	Whole body	Nasal route	Sinusitis	Green tea ant mixed with Durun bon (<i>Leucasaspera</i>)
Insect	Uisiringa	<i>Acheta domesticus</i>	House cricket	Gryllidae	Whole body	Oral	For improvement of better eye power	Remove wings and fried then prescribed to eat
Insect	Guboruwa	<i>Scarabaeus viettei</i>	Dung beetle	Scarabaeoidae	Whole body	Oral	Menstruation problem	Dung beetle mixed with earthworm were heated in a fry pan along with Fenugreek seeds mixed properly and prescribed to eat
Annelid	Juk	<i>Hirudinaria granulose</i>	Leech	Hirudinea	Whole body	Topical	Wound healing	Living leeches are used to suck blood and pus from wound
Annelid	Kesu	<i>Perionyx excavates</i>	Earthworm	Megascolecidae	Whole body	Oral	Pneumonia	3-5 earthworms are ground with Ginger, Tulsi and Black pepper mixed with honey and prescribed to eat
Annelid	Bundakesu	<i>Metaphirehoulletti</i>	Earthworm	Megascolecidae	Whole body	Topical	Piles	Head of earthworm is burned and ground to powder, mixed with coconut oil and Akon gos (<i>Calotropis gigantean</i>) and made a paste and gently applied on area
Gastropod	Shamuk	<i>Pila globosa</i>				Oral	For better improvement of eye	Fresh water snail cooked with split black gram and prescribed to eat for 1 month

Amphibia	Pat beng	<i>Polypedates spp</i>	Common tree frog	Rhacophoridae	Meat	Oral	Asthma	Meat boiled with spices like cloves, cinnamon mixed with Huhoni bon (<i>Spilanthusacmella</i>) and prescribed to eat
Amphibia	Suk vekuli	<i>Bufo stomaticus</i>	Common toad	Bufoidea	Blood with heart	Oral	Pneumonia	Fresh blood with heart mixed with Bihlonginihipa (<i>Diplaziumesculentum</i>) roots with cloves prescribed to eat
Amphibia	Panivekuli	<i>Ranna spp</i>	Frog	Ranidae	Meat	Oral	Asthma and for weakness	Meat cooked with spices and prescribed to eat
Fish	Magur	<i>Claris bratachus</i>	Walking catfish	Clariidae	Whole body	Oral	Chicken pox	Fish boiled with bamboo shoot with black pepper and prescribed to eat
Fish	Puthimaas	<i>Puntius ticto</i>	Ticto barb	Cyprinidae	Whole body	Oral	For better eye power	Whole fish is cooked with Manimuni pat (<i>Centellaasiatica</i>) and prescribed to eat
Fish	Goroi fish	<i>Channa marulius</i>	Great snakehead	Chanidae	Whole body	Oral	Leukorrhoea	Goroi fish boiled with Jobaphol (<i>Hibiscus spp</i>) prescribed to eat
Fish	Singi maas	<i>Heteropneustes fossilis</i>	Stinging catfish	Heteropneustidae	Whole body	Oral	Weakness Wound healing	Cooked with black pepper and prescribed to eat
Fish	Dorikona maas	<i>Rsbora doniconius</i>	Slender fish	Cyprinidae	Whole body	Topical	Nail infection	Fresh fish is mixed with Ratten shoot and made a paste and gently applied to the affected area
Fish	Rou maas	<i>Labeo rohita</i>	Rohu	Cyprinidae	Gall bladder	Oral	Gastric ulcer	The gall bladder ground and mixed with water and prescribed to drink it early morning
Fish	Kawoi maas	<i>Anabas testudineus</i>	Climbing perch	Anabantidae	Head	Oral	Menstrual pain	Head portion of the fish with Ginger and Papaya boiled together and prescribed to eat
Fish	Moa maas	<i>Amblypharyngodonmola</i>	Mola carpet	Cyprinidae	Whole fish	Oral	Pox Wound healing	Mola carpet with shukloti (<i>Pogostemonbenghalensis</i>) plant mixed together and steamed in a banana leaf and then prescribed to eat
Fish	Cengeli maas	<i>Channa stewartii</i>	Assamese snake head	Synbranchidae	Whole body	Oral	High blood pressure	Boiled the fish and prescribed to eat for 2 months
Fish	Borali maas	<i>Wallago attu</i>	Helicopter catfish	Siluridae	Whole body	Oral	Pox	Fish cooked with Jati-lau (<i>Lagenariasiceraria</i>) and prescribed to eat
Fish	Cushia	<i>Amphiponuscuchia</i>	Eel	Synbranchidae	Whole body	Oral	Anemia	Raw blood is prescribed to eat Meat portion is cooked with Marseng or (<i>Spilanthusacmella</i>) and prescribed to eat

Reptile	Kaso	<i>Aldabra gigantean</i>	Tortoise	Testudinidae	Meat Skin	Oral Topical	Pox Skin disease	Meat cooked with papaya and black pepper and prescribed to eat Skin is burned and ash added with coconut oil and applied to the wound for healing and removing of wound spot
Reptile	Tezpia	<i>Eutropiscarnata</i>	Common Indian skink	Scincidae	Meat	Oral	Body pain Snake bite	Boiled in water and after boiling the boiling water prescribed to drink
Reptile	Gui	<i>Varanus bengalensis</i>	Bengal monitor	Varanidae	Skin Meat	Topical Oral	Skin disease Body pain	Skin is burned and the ash mixed with coconut oil and made a paste then gently applied to the affected area Meat boiled with spices and prescribed to eat
Bird	Pati hah	<i>Anas platyrhynchos</i>	Duck	Anatidae	Tongue	Oral	Slurred Speech	Tongue is burned and the Smoky tongue is prescribed to eat with salt
Bird	Murgisorai	<i>Gallus domestica</i>	Chicken	Phasianidae	Meat	Oral	Post labour pain Bone fracture	Meat cooked with rice flour prescribed to eat
Bird	Parosorai	<i>Columba domestica</i>	Common pigeon	Columbidae	Meat	Oral	Low blood pressure	Meat cooked with banana flower and prescribed to eat
Bird	Kopousorai	<i>Columba livia</i>	Dove	Columbidae	Meat	Oral	Anemia	Meat cooked or boiled with spices and prescribed to eat
Bird	Fesa	<i>Tyto alba</i>	Owl	Tytonidae	Meat	Oral	Asthma Night blindness	Meat boiled and prescribed to eat
Mammal	Sagoli	<i>Capra aegagrus hircus</i>	Goat	Bovidae	Tongue	Oral	Slurred speech	Tongue is burned and the ash made a paste and prescribed to eat
Mammal	Gahori	<i>Sus crofa domestica</i>	pig	Suidae	Fats (oil)	Topical	Hair fall Joint pain	Oil is mixed with Jetuka (Henna) and gently massage at the roots of hair Oil is prescribed to apply to the pain area and gently massage
Mammal	Borbaduli	<i>Pipistrellus coromandris</i>	Indian fruit bat	Vespertilionidae	Meat	Oral	Asthma	Meat is cooked and prescribed
Mammal	Neol	<i>Herpestes edwardsii</i>	Mongoose	Herpestidae	Meat	Oral	Anemia Asthma	Cooked meat is prescribed to eat
Mammal	Kerketua	<i>Sciurus carolinensis</i>	Squirrel	Sciuridae	Meat	Oral	Asthma	Boiled meat is prescribed to eat

Mammal	Goru	<i>Bos indica</i>	Cow	Bovidae	Milk	Oral	Jaundice	Cow milk is mixed with missiri and Bhimkol(<i>Musa balbisianacolla</i>) and prescribed to eat
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lack of other resources, economic condition and accessibility in obtaining other medicines (Melo *et al.*, 2014).

The results of the study showed that the aged people of the villages are more experienced in the zootherapeutical practices and are carrying the knowledge given by their elders in their family (Verma *et al.*, 2014). This vital information and method of preparation were inherited from their past generations and is still common among the people of that area. However, during the field survey it was observed that, the sanitary conditions of animal based products and its storage were very poor. Sometimes it was also observed that many of the traditional healers who give medicines to humans also treat domestic animals without proper safety and sanitation. And many of these practitioners were infected with skin diseases and this was emanated from their poor personal, household hygienic conditions and ignorance with lack of education. This shows the obvious and easy contamination risks to these animal based products. Many of these interviewers expressed concern regarding the preparation, handling and storage of animal based medicine. Another interesting observation of the study was the preparation of some therapeutic medicines and handling the patients. For example, ring well/ stream collected water was used in one preparation for boiling of medicine and treatment of the wounds was done without wearing gloves and or adopting any safety precautions. These observations do suggest the need for proper attention by the educated persons in and around the villages for greater safety, sanitary practice and effective medicine preparation.

Nowadays, Indian traditional knowledge systems with zootherapeutic practices are fast eroding due to urbanisation (Igoli *et al.*, 2005). So, it is vital to study and document this age old zootherapeutic information regarding medicinal uses of different animals and its byproducts among

the different ethnic communities from these villages. As, Borah and Prasad (2016) observed, although traditional zootherapeutic medicine plays an important role in primary health care system right from ancient days, it is remarkable to state that while studying the traditional uses and use of animals and animal by-products for medicinal purpose, one should focus on maintaining ecological balance with species biodiversity conservation measures in mind. Otherwise excessive animal exploitation causes ecosystems to become unbalanced, and eventually endangers animal existence. So educating and enlighten the traditional practitioners and the end users is more important by focusing on the species which are endangered and were included in IUCN list (IUCN, 2020). Also further research is required to validate and confirm the bioactive crude compounds present in the animal based products used by these villagers with medicinal properties.

Conclusion

The present study shows that animals and animal based by-products occupy key positions in the primary healthcare and traditional medical practices to treat different health ailments. There have been numerous reports on the use of animal-based medicine in various regions of Assam, but this study is the first to attempt to detail and document the many animal species used in medicine by the indigenous people who live in and around five villages of south-eastern region of Golaghat district. It was evident that these traditional practitioners possessed considerable knowledge about the use and by-product preparation of the animals, administration and dosage. Traditional medicine may give ample scope to modern science for the discovery of novel medicines in treating many diseases. Hence, it is important to document the indigenous knowledge and create awareness in managing and maintaining the biodiversity for the welfare of human kind.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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