

## Zootherapeutic Knowledge of Two Ethnic Populations from Central Nepal

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**ABSTRACT** Zootherapy constitutes an essential part of the traditional pharmacopoeia of the country. Some of the zootherapeutic practices are still in use in spite of the development of modern medical system. Present paper studies documents the zootherapeutic practices of two ethnic groups, *Pahari* and *Danuwar*, from the central mountainous region of the country. Data have been collected by employing tools such as participant observation, questionnaire survey, structured interview, semi-structured interview and participatory rural appraisal. Zootherapy is equally popular in both the populations but there exists some differences in actual application and preparation of animal products. There are cases where the same animal part has been used to cure entirely different ailments in the two groups. Zootherapeutic potential of some of the neglected species can lead to their economic and cultural valorization. Mass production of such animals could help in providing protein supplement along with animal-based medicines to the people. These animals could also substitute other endangered animals which are still used in zootherapy. Present study also provides base-line data for further research and gives valuable inputs to biodiversity conservationists.

### INTRODUCTION

Healing with animal parts or products is called Zootherapy. Zootherapy is popular among ancient cultures all across the world (Lohani 2010, 2010b; Quave et al. 2010; Alves and Rosa 2006; Costa-Neto 1999; Joseph 1982; Kakati et al. 2002; Lev 2003; Lohani et al. 2008; Mahawar and Jaroli 2007; Sharma et al. 1995a). Animal based medicines are usually obtained from animal body parts, metabolic products and other bodily secretions or non-animal materials such as nests and cocoons etc. (Costa-Neto 2005). Not only ancient systems, modern medical system also utilizes animal based medicines. World Health Organization has reported that out of the 252 essential chemical selected, 11.1 percent come from plants, and 8.7 percent from animals (Marques 1997).

People in Nepal have been using animals of their vicinity in a variety of ways. Of all other uses, medicinal use of animals has been found to be the most popular one. Zootherapy has been playing an important role in the traditional pharmacopoeias of ancient cultures of Nepal. The ancient Nepali encyclopedia "Chandra Nighantu" describes some of the medicines derived from animal parts and products to treat a number of ailments (Devkota 1968). Some of the zootherapeutic practices are still prevalent among many ancient populations even though there is well-developed modern medical system in the country. Need for systematic documentation of such

ethnomedicinal practices has been emphasized by Lohani et al. (2008). It can be said with confidence that a lot of people in Nepal still have faith in some of the zootherapeutic remedies. *Pahari* and *Danuwar* which comprise 0.05 percent and 0.23 percent of the total population of the country respectively (CBS 2001) are two ancient cultural groups of Nepal. Like other cultural groups these groups too have been using animals and animal products in treating a number of locally diagnosed ailments. Some of the animal parts or products that are used in healing are found to be popular amongst both the populations with high frequency of quotation.

Of late, biodiversity in Nepal is threatened by a number of factors such as habitat encroachment, pollution, illegal hunting and trading and natural and human induced disasters (Majupuria et al. 2006; NPC 1998). Similarly, ancient human cultures are also losing their cultural traits because of acculturation. Consequently, ethnozoological knowledge, the forte of indigenous people, is also on the verge of extinction.

In view of the above mentioned loss of both the components of ethnozoology, the biological resources and ancient human cultures, only a little effort has been made to study and document the ever relevant and valuable ethnozoological knowledge in the country (Lohani et al. 2008; Shah et al. 1992, 2004; Shrestha 2003). In comparison to ethnobotany, ethnozoological study has always been neglected. Less attention has been paid to study and document the traditional

knowledge regarding phenomenon of zotherapy. So this pioneer paper studies the traditional knowledge on medicinal uses of animals in two ethnic groups, *Pahari* and *Danuwar*, in the middle mountainous region of Nepal before the ever-relevant traditional knowledge disappears forever. The study provides baseline data to carry out further investigation on animal medicines which are of high quotation frequencies. Some of these medicines could even prove to be the potential sources of future pharmaceutical agents. The paper will also be helpful in giving valuable information to the concerned authorities in formulating appropriate policy for the sustainable use of the animals that are widely utilized in zotherapy.

### STUDY AREA AND STUDY GROUPS

Present ethnozoological studies have been conducted in two small villages of *Paharis* and *Danuwar*s in the Kavrepalanchok and Lalitpur districts respectively in the middle mountainous region of the country. District Kavrepalanchok lies just outside the Kathmandu valley whereas district Lalitpur (Patan) lies very much inside the valley. Members of both the communities depend upon an economy of small-scale agriculture and raise a few livestock for milk, meat and manure (cows, buffalos, goat, pigs and poultry). Both the groups cultivate staple crops like paddy, wheat and corn. *Paharis* also produce potatoes in addition to these crops. Some vegetables are also grown side by side. Most of the *Paharis* are engaged in making candies from the fruits of *Choerospondias axillaries* ([Roxb.] BL Burt and AW Hill) locally called "*Lapsi*". Like other ethnic populations of the country, these people too have symbiotic relationship with the surrounding natural resources and also show their reverence to these resources. They observe festivals such as "*Bhumi Puja*" worshipping land, "*Kul puja*"-worshipping family deity, "*Ban devata Puja*"- worshipping forest god etc. in recognition to the importance of the resources (Bista 2000). During "*puja*" process, they usually sacrifice animals such as goats, cocks, pigeons, etc. (Pandeya 2004/2005).

### MATERIALS AND METHODS

**Methods of Data Collection:** Field research was conducted in the above study area to obtain

data on zotherapeutic knowledge during the period of June 2004-June 2006. Both qualitative and quantitative techniques were employed to gather data. Prior informed consent was obtained before conducting interviews.

Quantitative data were obtained by using techniques such as questionnaire survey and structured interview. For household level survey, a representative sample of 15 percent of the total households in each of the groups was obtained by simple random sampling method. One member in each of the households, usually head of the household, was interviewed with the help of a set of predetermined questions to find out the literacy status, side occupations, types and number of livestock raised and his or her zotherapeutic knowledge. Livestock unit per household was calculated where values for cow, ox, buffalo and goat were assigned after Shekhar (1998) as 1, 1, 1.5 and 0.2 units respectively. Since each of the groups is homogenous in structure the above mentioned sample size was thought to be a representative one. Qualitative data on zotherapeutic remedies were obtained by participant observation, semi structured interview, participatory rural appraisal (PRA) and key informant's interview. Fauna were identified using different taxonomic keys (Shah et al. 2004; Grimmet et al. 2003; Shrestha 2003; Shrestha 1981).

### RESULTS

**Socio-economic Data:** Literacy rate is found to be 52.9 percent (n=34) in *Pahari* group (Fig. 1) whereas in *Danuwar* group (Fig. 2), it is 54.8 percent (n=31). Main occupation in both the groups is agriculture. Different side occupations are shown in Figures 3 and 4. Per family land holding sizes are 0.16ha and 0.20 ha in *Pahari* and *Danuwar* respectively (Figs. 5 and 6). Per family livestock units (LSU where cow=1, ox=1, buffalo=1.5 and goat=0.2) are 1.8 in *Pahari* and 1.09 in *Danuwar* (Figs. 7 and 8).

**Zotherapeutic Knowledge and Practices:** A total of 19 animal species were reported as being used in 22 traditional zotherapeutic remedies for either human or animal health purposes. A detailed description of these remedies is given in Table 1. Systematic positions (Phylum, Class and Order), scientific names, common English names and vernacular names are provided along with popular use, preparation and application of these animal products.

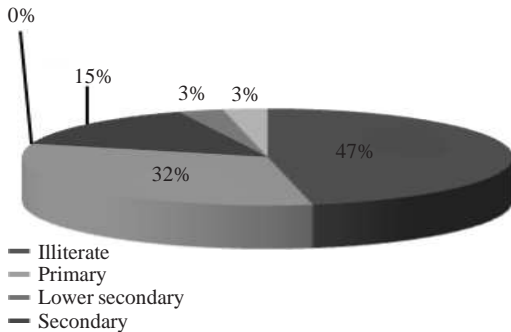


Fig. 1. Education status in Pahari group (n=34) based on questionnaire survey

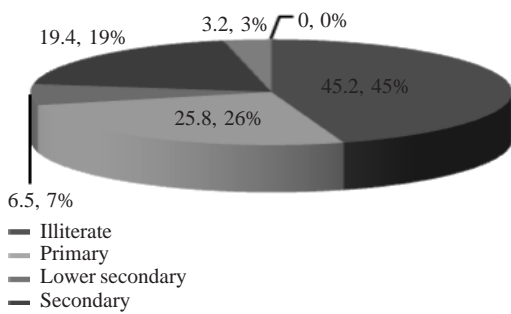


Fig. 2. Education status in Danuwar group (n=31) Source: Questionnaire Survey

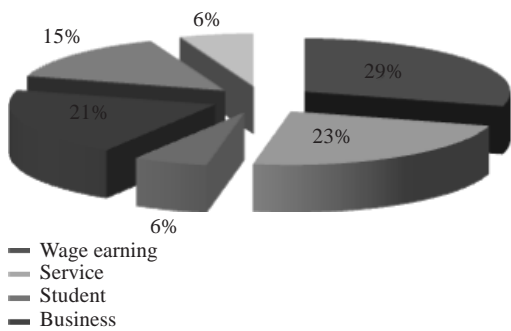


Fig. 3. Side occupations in Pahari group (n=34) based on questionnaire survey

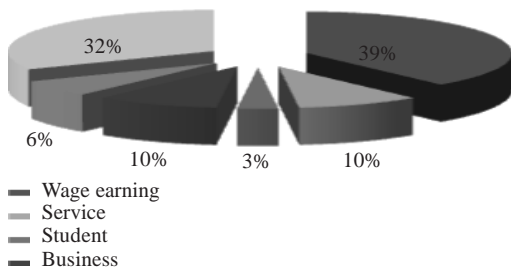


Fig. 4. Side occupations in Danuwar group (n=31) Source: Questionnaire Survey

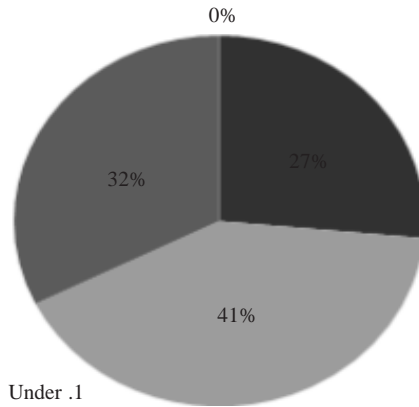


Fig. 5. Land holdings in Pahari (n=34) Source: Questionnaire Survey

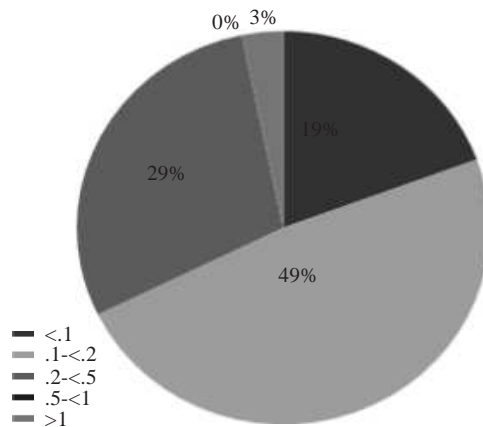


Fig. 6. Land holdings in Danuwar (n=31) Source: Questionnaire Survey

**Faunal Classification:** Only three animals are from group Invertebrata and the rest are all Vertebrates. Only one animal is from the Phylum Arthropoda and two fauna from the Phylum Mollusca from the Invertebrata group. Sixteen fauna are from the phylum Chordata which are as such - Class Teleostomii (4 fauna), Class Aves (8 fauna) and Class Mammalia (4 fauna).

**Animal Parts Used in Healing:** Animal parts/products that have become sources of remedies are varied (Fig. 9). Commonly reported source categories are—Whole animal (3 remedies 10 percent), head (2 remedies 7 percent), tail (1 remedy 3 percent), flesh (2 remedies 7 percent), gall bladder and bile (4 remedies 13 percent), liver (2 remedies 7 percent), gastro-intestinal tract (4

**Table 1: Popular uses of zootherapeutic remedies among Paharis and Danuwar with methods of preparation and applications. Fauna are provided with their common English names, local names and scientific names**

Phylum/ Class/ Order	Scientific name	Common English name	Vernacular name	Popular use		Preparation and application
				Pahari	Danuwar	
Arthropoda/ Crustacea/ Decapoda	<i>Himalaya- potamon</i> spp	Crab	<i>Gangato</i>	Control bedwetting	Reconstituent/ Neutraceuticals	Roasted crab is given orally in both <sup>P D</sup>
Mollusca/ Gastropoda/ Stylommato- phora	<i>Pila</i> spp	Snails	<i>Shankhe kira</i>	Reconstituent/ Neutraceutical	*****	Cooked and eaten <sup>P</sup>
Mollusca/ Gastropoda/ Stylommato- phora	Slug spp	Grey slugs	<i>Chiplekira</i>	Reconstituent/ Neutraceutical Plastering materials	Same as those of <i>Pahari</i>	Raw slug is swallowed whole. <sup>P D</sup> For plastering, raw slug is ground with stinging net- tle root and applied on the fracture site. <sup>P D</sup>
Chordata/ Teleostomii/ Symbranchi- formes	<i>Amphipnous cuchia</i> (Ham.)	Mud eel	<i>Bam machha</i>	*****	Anti-asthmatic Anti-rhinitic	Gall bladder of the fish is either used fresh or sun dried and stored for future use. In case of need, it is rubbed against a piece of stone with a little bit of water to obtain its paste. The paste is administered orally. <sup>D</sup>
Chordata/ Teleostomii/ Anguilli- formes	<i>Anguilla bengalensis</i> (Gray and Hardw)	Fresh water eel	<i>Rajbam</i>	Magico-religious	Anti-asthmatic Anti-rhinitic	Dried tail of the fish is soaked in water and the decanted water is given to the woman at time of her delivery. It is believed that the fish soaked water helps her to have normal and easy delivery. It is also believed that it facilitates easy ex- pulsion of placenta. <sup>P</sup> Dried gall bladder is soak- ed in water and rubbed on the stone to obtain its smooth paste. <sup>D</sup>
Chordata/ Teleostomii/ Cyprini- formes	<i>Tor putitora</i> (Ham.)	Carps or Mahaseer	<i>Sahar</i>	*****	Anti-asthmatic	Bile is administered orally to cure asthma. <sup>D</sup>
Chordata/ Teleostomii/ Cyprini- formes	<i>Schizothorax plagiostomus</i> (Heckel)	Hill- stream trout	<i>Sun asla</i>	Digestant in curing headache	*****	Gastrointestinal tract along with its contents is boiled in water and eaten to cure digestive disorder, body ache and to increase appetite. <sup>P</sup> Bile is eaten in curing head- ache. <sup>P</sup>
Chordata/ Aves/ Passeri- formes	<i>Myophonus caeruleus</i> (Scopoli)	Blue Whistling Thrush	<i>Kalchaude</i>	In curing stammering Neutraceutical	*****	It is believed that oral intake of fresh uncooked blood corrects stammering and tuberculosis. <sup>P</sup>
Chordata/ Aves/ Columbi- formes	<i>Columba</i> spp	Pigeon	<i>Parewa</i>	Anti-rhinitic	*****	Cooked meat is eaten to cure cough and cold. <sup>P</sup>
Chordata/ Aves/ Passeri- formes	<i>Sturnus contra</i> (Linn)	Asia Pied Starling	<i>Dangre Sarau</i>	Anti-dysentery	*****	Head is chopped off the body and thus oozing warm blood is sucked in to cure blood dysentery. Some peo-

**Table 1: Contd.....**

Phylum/ Class/ Order	Scientific name	Common English name	Vernacular name	Popular use		Preparation and application
				Pahari	Danuwar	
Chordata/ Aves/ Passeri- formes	<i>Passer</i> spp	House and tree sparrow	<i>Bhangera</i>	*****	Aphrodisiac (EV) Vulnerary for wounds and burns	ple eat cooked meat of the bird to cure dysentery. <sup>P</sup> Head part of the killed bird is inserted in a ball of kneaded flour and fed to he-buffalo. It is believed that it enhances the buffalo's sexual desire. <sup>D</sup> Feces of the bird are topi- cally applied to the wound to accelerate the process of pus formation for quick healing. <sup>D</sup>
Chordata/ Aves/ Strigiformes	<i>Athene brama</i> (Temminck)	Spotted Owlet	<i>Latokosero or Kochal gande</i>	*****	In curing night blindness	Head of the bird is cooked and eaten to cure night blindness. <sup>D</sup>
Chordata/ Aves/ Charadri- formes	<i>Vanellus</i> spp	Red- wattled Lapwing	<i>Huttityau</i>	*****	Digestant Anti- jaundice	Eggs of the bird are sup- posed to cure jaundice and gastritis. <sup>D</sup>
Chordata/ Aves/ Ciconii- formes	<i>Ardeola</i> spp	Indian Pond Heron	<i>Asakote bakulla</i>	*****	Haemostatic	Down feathers are topically applied to the fresh cut wound to stop bleeding. <sup>D</sup>
Chordata/ Aves/ Galliformes	<i>Gallus gallus</i> (Linn)	Domestic fowl	<i>Kukhura</i>	Vulnerary for wounds Emollient Magico-religious	Vulnerary for wounds and burns in human and ox (EV) Anti-rheumatic	Fat is topically applied to cracks and burns and to soften skin. Cocks are used in faith healing. <sup>P</sup> Fat is topically applied to cure burns and body is mass- aged with fat to cure rheu- matism. It is also applied to cure wound in the neck region of oxen caused by the friction of the yolk as a result of continuous plow- ing for longer period. <sup>D</sup> Gastrointestinal tract along with its contents is boiled with water and the soup is taken orally to cure asthma. Its flesh is also cooked and eaten to cure cough and cold. Items such as meat and gastrointestinal tract are also sun dried and preserved for future use as medicine. <sup>P</sup>
Chordata/ Mammalia/ Rodentia	<i>Hystrix indica</i> (Kerr), <i>H. brachyura</i> (Linnaeus)	Porcupine	<i>Dumsi</i>	Anti-asthmatic in cough and cold		Body parts like fat and liver are eaten to treat asthma and dysentery. These parts are even dried and preser- ved for the future use. <sup>P</sup>
Chordata/ Mammalia/ Carnivora	<i>Selenarctos thibetanus</i> (Cuvier)	Himalayan Black Bear	<i>Kalo Bhalu</i>	Anti-asthmatic Cures dysentery	*****	Scales are rubbed against the stone with a little bit of water to obtain its smooth paste. The paste is then administered orally three times a day to treat asthma of initial phase. <sup>P</sup>
Chordata/ Mammalia/ Pholidota	<i>Manis pentadactyla</i> (Hodgson)	Scaly anteater	<i>Salak</i>	Anti-asthmatic	*****	

**Table 1: Contd.....**

Phylum/ Class/ Order	Scientific name	Common English name	Vernacular name	Popular use		Preparation and application
				Pahari	Danuwar	
Chordata/ Mammalia/ Carnivora	<i>Canis aureus</i> (Linnaeus)	Golden Jackal	<i>Syal</i>	Anti-arthritis Vulnerary for wounds	Anti-arthritis Vulnerary for wounds Neutraceuticals	Alcoholic beverage obtained from the fermentation of the mixture of jackal meat and local grains, is used as medication. The body is massaged with it to cure gout and arthritis. Bone paste obtained by rubbing on stone is applied to wounds. Other body products such as fat and bile are also used differently to cure a number of ailments. <sup>PD</sup> Meat is eaten to cure above ailments among <i>Danuwar</i> s.

Abbreviations used to denote ethnic groups: P: Pahari, D: Danuwar,  
Types of application: EV: Ethnoveterinary remedy

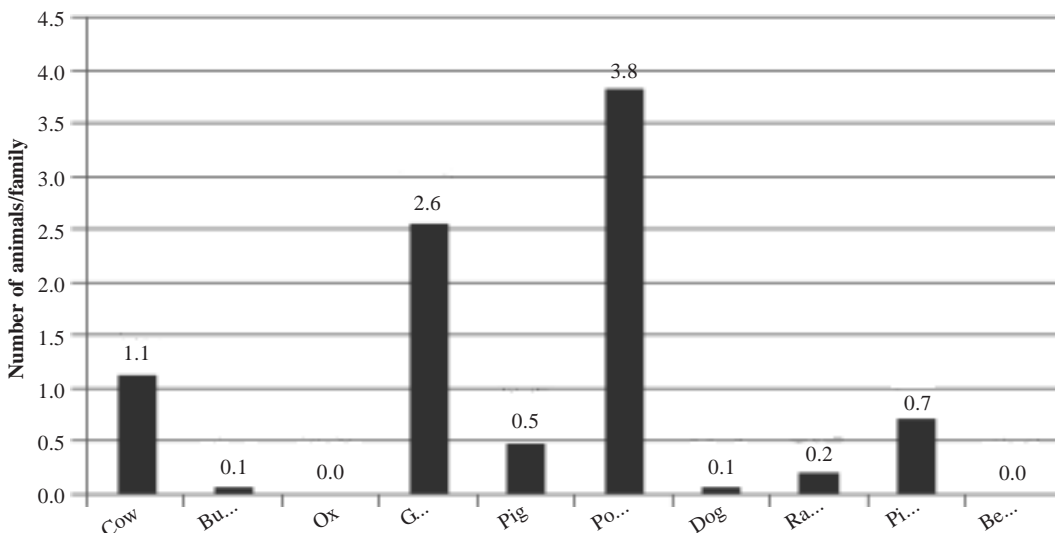
remedies 13 percent), fat (4 remedies-13 percent), blood (3 remedies 10 percent), eggs (2 remedies 7 percent), excreta (1 remedy 3 percent), feather (1 remedy 3 percent) and scales (1 remedy 3 percent).

**Different Categories of Use Reported:** All together 22 categories of use were reported (Fig. 10). These include applications for the treatment of various forms of ailments. Reported categories in both the groups were reconstituent, neutraceutical, antirhinic, antiasthmatic and cold remedies, anti-rheumatic, anti-arthritis, and night blindness, anti-gastric, emollient, haemostatic, vulnerary, bed-wet controlling, stammer correct-

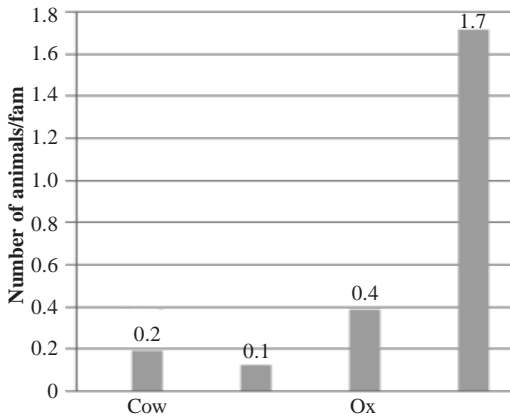
ing, aphrodisiac, digestant, anti-pyretic, dysentery control, anti-jaundice, headache curing, plastering and magico-religious applications.

## DISCUSSION

Not much difference has been found in socioeconomic status between the groups studied. All of them depend upon agriculture for their livelihood. Preferred livestock in both the groups are cow, buffalo and goat. Per family livestock unit (LSU) in *Pahari* has been found to be a little higher than that of *Danuwar*. Without exception all of them have kept local varieties of poultry.



**Fig. 7. Per family livestock in Pahari (n=34)**  
Source: Questionnaire Survey

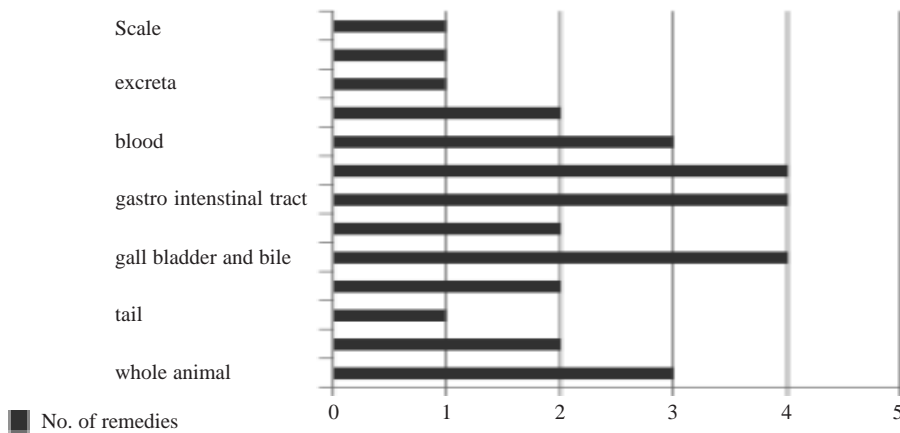


**Fig. 8. Per family livestock in Danuwar (n=31)**  
 Source: Questionnaire Survey

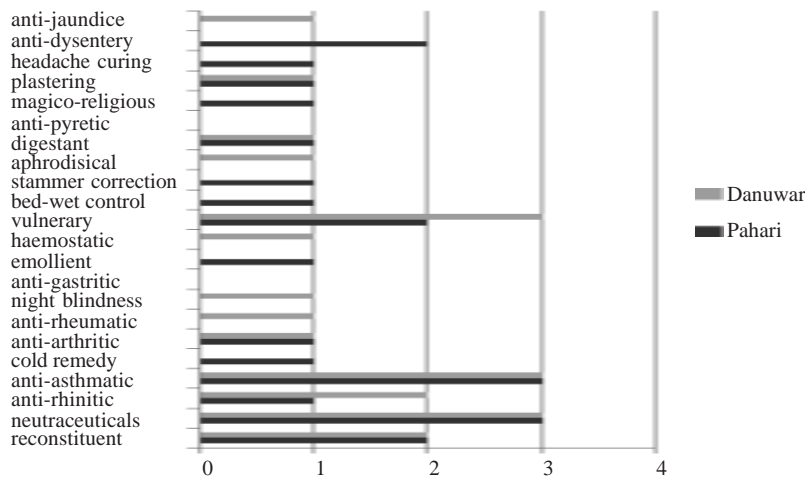
Both the groups hold knowledge on zootherapeutic potential of a number of animals both domestic as well as wild in curing locally diagnosed ailments. Both have zootherapeutic knowledge on mostly Vertebrates. However, except a few, most of the uses are no longer in practice these days. Some of the zootherapeutic remedies are specific to only one group whereas some are equally popular in both the groups.

Slugs serve as reconstituent and nutraceutical agents for both the groups. These are also used in fractures and healing of bones in both. Use of eggs of Pulmonates in sprains is reported from other researchers as well (Costa-Neto 1996).

It is interesting to note that while in some cases the same animal (or a similar species) is used in the both the groups, the actual parts of the ani-



**Fig. 9. Animal parts used in traditional zootherapeutic remedies**



**Fig. 10. Different categories of use in Paharis and Danuwar**

mal and the application often diverge. Examples of crab *Himalayapotamon* spp and *A. bengalensis* can be cited to explain the above mentioned finding. In *Pahari* group, roasted crab is used to stop bed-wetting whereas in *Danuwar* group cooked crab is used as reconstituents and neutraceuticals in case of tuberculosis and typhoid. Similarly, tail of *Anguilla bengalensis* has magico religious value to *Paharis* while gall bladder of the same animal is used as cold remedy among *Danuwar*s.

It is also found that different parts of the body of the same animal are used to cure different ailments. Alcohol obtained by the fermentation of jackal flesh and local cereal is used as anti-arthritis applications whereas bone paste of the same animal is used to cure wounds. Similarly, bile of *Histrix* sp is used to cure headache while boiled gastro-intestinal tract along with its contents of the same animal is used as digestive disorder remedy. Same case is found in *Passer* sp also where head has aphrodisiac value but its excreta is used in healing wound.

Bile of many animals has been found to be useful in curing a variety of ailments. In some cases it is taken orally while in others it is applied topically. Bile of *A. bengalensis*, *T. putitora*, and *S. plagiostomus* is used as remedies in cold, asthma and headache respectively. Use of bile and gall bladder in curing malaria, typhoid and tuberculosis has been reported by Solanki et al. (2004)

Fat of a number of animals of the Classes Aves and Mammalia has been found to be used as vulnerary, emollient and anti-rheumatic agents. Similar finding has been reported from Brazil by Begossi et al. (1999), where fat of ray fish is used to cure rheumatism.

In some of the animals exoskeletal parts such as scales (*Manis pentadactyla*) and feathers (*Adreola* spp) have been used as anti-asthmatic and haemostatic applications.

### CONCLUSION

It is found that animal-based remedies constitute an important part of traditional medicine in both the study sites. But there exists a significant difference between the two groups in actual application and preparation of animal products. There are cases where the same animal part has been used to cure entirely different ailments. It has also been found that some of the easily avail-

able but neglected animals such as crabs, slugs and eels have tremendous ethnozoological value. Mass production and proper management of such animals could help in minimizing the existing protein gap in the country and also in providing animal-based medicines to the people. Such production could also provide substitute for the highly-valued but rare and endangered animals thereby contributing to the conservation of the dwindling biodiversity of the country. Present study also provides base-line data to carry out further research in finding essential biological compounds responsible for healing in some of the cited animals. Zootherapeutic potential of some of the species can lead to the economic and cultural valorization of animals usually regarded as useless.

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