Ethnozoological Studies of Medicinal Animals and Their Products Used by the Velip Tribal Community in Goa, India

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Abstract: Ethnozoological study emphasizes the significance of the traditional knowledge and the roles played by animals in human society. It is a hybrid discipline that integrates both the natural and social science that examines the historical, sociological, anthropological, economic and environmental aspects of the relationships between humans and animals. It can be understood broadly, from ecological, cognitive and symbolic perspectives. Zootherapy is healing of human ailments by using medicines prepared from different animals and animal derived by-products. Animals are vital to research that has direct or indirect effects on human health, in addition to being used in traditional medicine and as a source of pharmaceuticals. In India, 109 animal species are used for medicinal purposes, such as monkey’s excreta, porcupine spine, pangolin scales, cow urine, cow dung, scorpion, frog, bison milk, turtle, earthworms, honey and invertebrates. Several researchers have made an attempt to study and document the traditional knowledge of ethnozoological aspects including usage of medicinal animals by traditional healers and indigenous inhabitants. However, there is no authentic documentation on the use of medicinal animals in the treatment for various diseases in primary health care system by the tribal communities in Goa. Hence present survey was conducted to record the medicinal animals used by Velip community of Goa.

Keywords: Ethnozoology, Goa, Tribes, Medicinal animal, Zoo therapy, Velip


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Introduction

Various Ayurvedic practices, usage of medicinal animals and plants in therapeutic traditional medicines have been reported and documented in ancient texts such as Agnivesha Samhita, Charaka Samhita, Ashtanga Hridayam and Ashtanga Sangraha Bhava Prakash and Madhava Nidanam. The traditional medicinal knowledge among indigenous tribal communities all over the world has played a crucial role in discovering floral and faunal resources of commercial utilization and also to conserve them. About 15 to 20% of the Ayurvedic medicine in India is based on animal
derived substance such as milk, cheese, eggs, chicken and other animal’s parts. (Unnikrishnan, 1998). Studies of the traditional medicine have established a significant role in developing art of bio-prospecting for pharmaceutical compounds (Costa Neto, 2005).

India has a rich biodiversity of medicinal plants and animals with great cultural diversity with many indigenous communities who are dependent on the traditional medicine for their health care (Padmanabhan et al., 2008) Ethno zoological aspects and their usage by traditional healers was reported from Assam (Borah and Prasad, 2017).

Goa is India’s smallest state in terms of area and also the fourth smallest state in terms of countries population. The Western Ghats, which make up the majority of eastern Goa, have gained recognition as one of the world’s biodiversity hotspots. Goa is flourished with rich diversity of flora and fauna resources which predominates with many tribal groups that use animal body parts as traditional medicine (Chinlampianga et al., 2013) and this can lead to endanger species, used in ethno medicine due to killing of animals. Goa has four major ethnic tribal communities with advantage for evolving knowledge on ethnozoology. They have developed their own medicinal practices through their traditional knowledge system.

Goan tribes are grouped into four communities viz, Gawda, Kunbi,Velip and Dhangar. There is continuity in their lifestyle, customs, practices, traditional, religious beliefs, etc. Velip are Worshippers of Mallikarjuna an incarnation of Lord Shiva and Gaonkars are the people whose ancestors settled in a Goan villages. Velips practice the joint family system, which is not observed among the other tribes. They follow the Budhavant (Wise Elder) system (Romesh Bhandari, 1999). Velip community clan is derived based on occupation; for example Vaiz means medicine man (Bezbaruah, 2003). They mostly live in remote areas or found in forest regions like Sanguem, Quepem and Canacona.

Traditional medicine includes practices based on the theories, beliefs, skills and experiences, unique and indigenous to different cultures, which are used to diagnose and treat illnesses of both physical and mental (Verma et al., 2014; Kandari et al., 2015; Bagde and Jain, 2017) The knowledge of indigenous traditional medicine in most cases is practiced and preserved through oral folklore (Eshete, 2016). Thus, it is time-tested practice of careful observation of trial and error experiments that develop and change with time and space in the process of human interaction with their environment. It is the result of long years of experience of several generations. However, this knowledge can be lost with the death of the knowledgeable elderly persons as different ethnic groups transfer the traditional medicinal knowledge orally from elderly persons from generation to generation. Loss of traditional knowledge of indigenous communities had impact on the development of modern medicine (Martin, 1995). Important ingredients for the preparation of protective, curative, and preventive medicine are domestic and wild animals and their by-products such as skins, hooves, tusks, bones, feathers (Angeletti, 1992; Vedavathy, 2002).

Industrialization, urbanization and the so called modernization are the important unavoidable changes and have tremendous impact on our traditional ethno zoological knowledge of medicinal animal usage in the rural population, mainly in the tribal communities of Goa. It is evident if our traditional knowledge of therapeutic use of medicinal animals is not properly studied and preserved it may vanish forever. For the upgradation of this knowledge, it is very essential to document the tribal traditional therapies involving medicinal animals. Hence, present investigation was designed to document medicinal animals and their products used by the tribal communities in Goa.

Materials and Methods

The present investigation was carried out from September 2022 - January 2023. Surveys were undertaken in Velip communities of Goa, India.
The presentation is based on information gathered through interview with village or community elders having the knowledge of identifying the wild life and their traditional use in their society and are popularly known as "Voktoli".

Before starting survey we introduced ourselves, objectives of our research and asked for permission to record the data and to take photographs. The questionnaire included the local name of the medicinal species, parts used to treat diseases, process of medicine preparation and administration. The length of each interview lasted for approximately two hours.

According to them, their knowledge of traditional medicines was acquired through parental heritage and/or they have gained experience of usage of medicinal animals and their values in treatment of different ailments. In addition to medicinal animals we also come to know that each community in Goa has their unique customs and traditions, life style and their interaction with animals. At the end of the survey we took their details including name, place and age. The age of the tribal interviewed ranged between 40 to 80 years. They all had answered in Konkani and we translated it to English.

From the collected data fidelity level and used values were determined using the below mentioned formula:

$$Fidelity \text{ Level}= \left( \frac{N_p}{N} \times 100 \right) \%$$

Where $N_p$ is the number of informants that mentioned the specific animal species used to treat certain ailments and $N$ is the total number of informants who utilized the animals as medicine for treating any given ailments.

$$\Sigma iUV_i \over N$$

Use value (UV) = $N$

Where $U_i$ is the number of particular animal species use reports, cited by the informants and $N$ is the total number of informants interviewed.

The study areas are Adnem, Barcem, Morpirla, Subdolem, Maina, Sirvoi in Quepem; Colomba, Kongarem, Valkini, Potrem in Sanguem; Navar, Gulem and Cola in Canacona, villages from south Goa.

**Results**

33 medicinal animals were used to treat 42 different ailments in Velip community. Altogether, 14 informants had responded to this study. From all 33 animals' species, 25 species belongs to vertebrates group and 8 species belongs to invertebrate group.

The medicinal animals used by velip community are - 15 species of class Mammalia, 4 Aves, 3 Reptilia, 1 Amphibia, 2 from each class Fishes, Clitellata, Insecta, 1 species of each Arachnida, Malacostraca, Bivalvia and Cephalopoda (Table 1).

In Velip community, whole body of Earthworm used to relieve wound healing has the highest fidelity level of 100% .Excreta of Monkey used to relieve slender has the lowest fidelity level of 33% (Table 2).

The present study reported Honey bee (Apis mellifera) as the commonly cited medicinal animal with %UV = 100%, and Indian Pangolin (Manis crassicaudata) with %UV= 3.5% as a least common cited medicinal animal in Velip community (Table 3).

**Discussion**

India has an immense faunal, floral, as well as cultural diversity with many ethnic communities who are primarily dependent on the traditional medicinal system for their primary health care. (Alves and Rosa, 2005; Vijaykumar et al., 2015).

The tribes gain the knowledge of traditional medicine from their parents or elderly people of their village mainly through practice and experience. From the present study, it is concluded that the medicinal animal's knowledge is in direct proportion to the age of the practitioner. Similar observation was made by Das (2015). According to informants of different age group, 65-75 years' practitioners were with the
Table 1: Ethno zoological studies of medicinal animals and their usage by traditional healers in Velip Community

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Phylum/Class/Zoological name</th>
<th>Common name/local name</th>
<th>Disease treated</th>
<th>Part used</th>
<th>Medicine preparation</th>
<th>Mode of application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chordata/Mammalia/Semnopithecus entellus</td>
<td>Monkey/ Maakad</td>
<td>Chicken pox, Heavy cold, slender</td>
<td>Excreta</td>
<td>Mix with water + monitor lizard bile juice + medicinal plant. Dried and mix with water</td>
<td>Oral administration</td>
</tr>
<tr>
<td>2</td>
<td>Chordata/Mammalia/Felis catus</td>
<td>Cat/ Maanjor</td>
<td>Bitten by rat</td>
<td>Bone</td>
<td>Bone is boiled in water (soup)</td>
<td>Oral administration</td>
</tr>
<tr>
<td>3</td>
<td>Chordata/Mammalia/Rattus norvegicus</td>
<td>Rat / Undir</td>
<td>Bitten by cat, Paralysis</td>
<td>Bone</td>
<td>Bone is boiled in water (bones soup is made)</td>
<td>Oral administration</td>
</tr>
<tr>
<td>4</td>
<td>Arthropoda/Insecta/Apis mellifera</td>
<td>Honey Bee/ Mhovamoose</td>
<td>Cough, Cold, Cure eye infection, Heal burnt skin</td>
<td>Honey</td>
<td>Collect honey from the hives</td>
<td>Oral administration</td>
</tr>
<tr>
<td>5</td>
<td>Chordata/Mammalia/Homo sapiens</td>
<td>Human/Manis</td>
<td>Eye infection, Antiseptic for wound healing</td>
<td>Milk, Urine</td>
<td>Collecting products from human</td>
<td>Oral administration</td>
</tr>
<tr>
<td>6</td>
<td>Chordata/Mammalia/Bos taurus</td>
<td>Cow/Gaay</td>
<td>Weakness due to fever, Diabetes, Stomach pain, Jaundice, Diarrhoea</td>
<td>Urine, Milk, Bile</td>
<td>Mix with little amount of water. Drink directly. Tender guava leaves paste + mixed with urine. Cashew tender leaves paste + mixed with milk for human. Dry and mixed with water.</td>
<td>Oral administration</td>
</tr>
<tr>
<td>7</td>
<td>Chordata/Mammalia/Hystrix indica</td>
<td>Indian Porcupine/ Sal</td>
<td>Bitten by snake, Skin disease</td>
<td>Spine, Bile</td>
<td>Dried and rubbed on stone with water.</td>
<td>Oral administration</td>
</tr>
<tr>
<td>8</td>
<td>Chordata/Mammalia/Ursus arctos</td>
<td>Mongoose/ Mungus</td>
<td>Snake bite (Gobra)</td>
<td>Bone</td>
<td>Bones are rubbed on stone with water.</td>
<td>Oral administration</td>
</tr>
<tr>
<td>9</td>
<td>Chordata/Reptilia/Varanus bengalensis</td>
<td>Monitor Lizard/ Saanp</td>
<td>Rheumatic pain, Fever, sudden Paralysis, Headache, Stomach pain, Chicken pox</td>
<td>Meat, Bile, Brain</td>
<td>Meat is boiled Bile mixed with water Rubbed with water</td>
<td>Oral administration</td>
</tr>
<tr>
<td>10</td>
<td>Annelida/Clitellata/Pheretima posthuma</td>
<td>Earthworm/ Gayndol</td>
<td>no lactation after pregnancy, Wound healing, Snake bite</td>
<td>Whole body</td>
<td>live earthworm are mixed with water Dried body is boiled with water</td>
<td>Oral administration</td>
</tr>
<tr>
<td>11</td>
<td>Chordata/Mammalia/Bos gaurus</td>
<td>Gaur/ Gavo redo</td>
<td>Vaginal discharge, Brush the tongue of the small children, Asthma, Hair loss</td>
<td>Milk, Dung</td>
<td>Dried and rubbed on stone with water. Dried milk directly used to brush the tongue. Collect fresh dung</td>
<td>Oral administration</td>
</tr>
<tr>
<td>12</td>
<td>Chordata/Aves/Pavo cristatus</td>
<td>Peacock/ Mor</td>
<td>Paralysis, Skin problem</td>
<td>Meat</td>
<td>Make curry and eat.</td>
<td>Oral administration</td>
</tr>
</tbody>
</table>
Joint pain  

Legs and mix with coconut oil. Apply on joints.

13  
Chordata/Mammalia/Rusa unicolor  
Sambar / Meru  
Arthritis  
Horn  
Powder is made of legs and mix with coconut oil. Apply on joints.

14  
Chordata/Mammalia/Moschiola indica  
Mouse deer / Piso  
Vaginal discharge  
Continuation of period.  
Miscarriage fetus  
Drying the fetus and rubbed on stone with water. Oral administration.

15  
Chordata/Amphibia/Hoplobatrachus tigerinus  
Indian bull Frog/Bebo  
Burnt Wound  
Asthma  
Meat  
From meat oil is made. Boiled and eaten. Apply on wound. Oral administration.

16  
Chordata/Mammalia/Lepus nigricollis  
Indian hare or Rabbit / Soso  
To treat fits.  
Blood  
Fresh blood is used. Oral administration.

17  
Chordata/Mammalia/Panthera tigris  
Tiger /Vagh  
Cough  
Breathing problem  
Meat  

18  
Chordata/Reptilia/ Ahaetulla nasuta  
Common Vine snake/ Haryali  
Earache  
Body  
Take fresh blood and use as medicine. Pour directly into the ear (dropwise).

19  
Arthropoda/Arachnida/ Hottentotta tamulus  
Scorpion / Vinchu  
Cracks on foot  
Earache  
Body  
Body is boiled in coconut oil. Apply on cracks. Dropwise pouring into ear.

20  
Chordata/Mammalia/Sus scrofa  
Wild Boar/ Rannadukkor  
Burnt skin  
Fat  
Oil is extracted after drying the skin under the sunlight. Apply on skin.

21  
Chordata/Mammalia/ Monis crassicaudata  
Indian Pangolin/ Theryo  
Skin inflammation  
scales  
direct  
Apply on skin.

22  
Chordata/Aves/Columba livia  
Pigeon / Parvo  
Cough, cold  
Flesh bloods  
Direct consumption  
Oral administration.

23  
Mollusca/Bivalvia/ Meretrix meretrix  
Clams/ Tisryo  
weakness  
Outer shell  
Ash of the shell is made. Oral administration.

24  
Chordata/Reptilia/Lissyms punctata  
Indian flapshell turtle/Kasov  
Headache  
Carapace  
Shell is rubbed with water. Apply on forehead.

25  
Chordata/Actinopterygii/ Cirrhinus miragala  
Mrigal carp/ Mori  
Good for eyes  
Flesh  
Boiled and eaten  
Oral administration.

26  
Arthropoda/Insecta/ Crematogaster subnuda  
Acrobat ant/ Huran  
Fever  
Live ant  
Collect ant and stored in container. Put on hard.

27  
Chordata/Actinopterygii/ Channa striata  
Murrels/Chikalo  
Continuously dripping of saliva.  
Whole body  
Collect fish and eat directly. Oral administration.

28  
Arthropoda/Malacostraca/ Charybdis goaensis  
Crab/ Kurli  
Asthma  
Whole body  
Flesh consume for 2 months Oral administration.

29  
Annelida/Gelatella/ Hirudinaria granulosa  
Leech/ Kanti  
To remove bad blood  
Live leech  
Live leech is collected. Suck the blood.

30  
Chordata/Mammalia/ Paracheirus micropus  
Indian Hedgehog/ Thekud  
Red urine  
Intestine  
Intestine is removed and dried and rubbed it with some water. Oral administration.

31  
Chordata/Aves/Gallus gallus domesticus  
Hen or Chicks/ Kombdi  
Sty in the eye  
Retina function and vision.  
Saliva Eggs  
Saliva is removed from the chics. Collect the eggs. Apply on sty. Oral administration.

32  
Chordata/Aves/ Spilopelia chinensis  
Spotted dove/ kovda  
To become thin.  
Urine stones,  
Meat  
Curry is made and eaten. Oral administration.

33  
Mollusca/Cephalopoda/ Sepia officinalis  
Cuttle fish/ Maanki  
Cuts in mouth  
Tongue  
Tongue is removed and dried. Apply on cuts.

Table 2: Fidelity level of Medicinal animals in Velip community

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Animal Species</th>
<th>Part Used</th>
<th>Indication</th>
<th>Number of Informants for the Indication</th>
<th>Total Number of Informants using the Animal/ Products</th>
<th>Fidelity Level (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monkey</td>
<td>Excreta</td>
<td>Chicken pox</td>
<td>4</td>
<td>5</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Heavy cold</td>
<td>2</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>slender</td>
<td>1</td>
<td>3</td>
<td>33</td>
</tr>
<tr>
<td>2</td>
<td>Cat</td>
<td>Bones</td>
<td>Bitten by rat</td>
<td>3</td>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>Animal</td>
<td>Part Used</td>
<td>Effect</td>
<td>Rating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------</td>
<td>------------------------------------------------------------------------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rat</td>
<td>Bone</td>
<td>Bitten by cat</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Honey bee</td>
<td>Honey</td>
<td>Cough</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human</td>
<td>Milk</td>
<td>Eye infection</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cow</td>
<td>Urine</td>
<td>Weakness</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Porcupine</td>
<td>Spine</td>
<td>Bitten by snake</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mongoose</td>
<td>Bone</td>
<td>Snake bite</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor lizard</td>
<td>Meat</td>
<td>Rheumatic pain</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earthworm</td>
<td>Body</td>
<td>No lactation after pregnancy</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gaur</td>
<td>Milk</td>
<td>Vaginal discharge</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td>Brush the tongue of small children</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dung</td>
<td>Asthma</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peacock</td>
<td>Meat</td>
<td>Paralysis</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td>Skin problem</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leg</td>
<td>Joint pain</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sambar</td>
<td>Horn</td>
<td>Arthritis</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mouse deer</td>
<td>Miscarriage fetus</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian bull</td>
<td>Meat</td>
<td>Burnt wound</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frog</td>
<td>Blood</td>
<td>To treat fits</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peacock</td>
<td>Leg</td>
<td>Neck bone</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mouse deer</td>
<td>Body</td>
<td>Earache</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boar</td>
<td>Fat</td>
<td>Burnt skin</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pangolin</td>
<td>Scales</td>
<td>Skin inflammation</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pigeon</td>
<td>Flesh blood</td>
<td>Cough, cold</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clams</td>
<td>Outer shell</td>
<td>Weakness</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian flap shell turtle</td>
<td>Carapace</td>
<td>Headache</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrigal carp</td>
<td>Flesh</td>
<td>Good for eyes</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Murrels</td>
<td>Body</td>
<td>To stop Continuously dropping of saliva</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crab</td>
<td>Whole Body</td>
<td>Asthma</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leech</td>
<td>Live leech</td>
<td>To remove bad blood</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acrobat ant</td>
<td>Live ant</td>
<td>To treat fever</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hedgehog</td>
<td>Intestine</td>
<td>Red urine</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hen</td>
<td>Saliva</td>
<td>Sty in the eye</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ratification:**
- **Rating:** The rating is from 1 to 10, where 10 is the highest effectiveness.
- **Bitten by cat:** The condition caused by biting a rat.
- **Meat paralysis:** The condition caused by eating meat.
- **Cure eye infection:** The condition caused by eye infection.
- **Heal burnt skin:** The condition caused by burning skin.
- **Eye infection:** The condition caused by eye infection.
- **Antiseptic for wound healing:** The condition caused by antiseptic for wound healing.
- **Weakness:** The condition caused by weakness.
- **Stomach pain:** The condition caused by stomach pain.
- **Jaundice:** The condition caused by jaundice.
- **Diarrhoea:** The condition caused by diarrhoea.
- **Bitten by snake:** The condition caused by biting a snake.
- **Snake bite:** The condition caused by biting a snake.
- **Rheumatic pain:** The condition caused by rheumatic pain.
- **No lactation after pregnancy:** The condition caused by no lactation after pregnancy.
- **Vaginal discharge:** The condition caused by vaginal discharge.
- **Vaginal continuation of period:** The condition caused by vaginal continuation of period.
- **Burnt wound:** The condition caused by burnt wound.
- **To treat fits:** The condition caused by treating fits.
- **Breathing problem:** The condition caused by breathing problem.
- **Earache:** The condition caused by earache.
- **Burnt skin:** The condition caused by burnt skin.
- **Skin inflammation:** The condition caused by skin inflammation.
- **Cough, cold:** The condition caused by cough and cold.
- **Weakness:** The condition caused by weakness.
- **Headache:** The condition caused by headache.
- **Good for eyes:** The condition caused by good for eyes.
- **To stop Continuously dropping of saliva:** The condition caused by stopping continuously dropping of saliva.
- **Asthma:** The condition caused by asthma.
- **Continuously dropping of saliva:** The condition caused by continuously dropping of saliva.
- **To remove bad blood:** The condition caused by removing bad blood.
- **To treat fever:** The condition caused by treating fever.
- **Red urine:** The condition caused by red urine.
- **Sty in the eye:** The condition caused by sty in the eye.
## Table 3: Utility Value of Medicinal animals in Velip community

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Scientific Name</th>
<th>English Name</th>
<th>Local Name (Konkani)</th>
<th>$\Sigma iUvi$</th>
<th>$Uv$</th>
<th>%UV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Semnopithecus entellus</em></td>
<td>Monkey</td>
<td>Maakad</td>
<td>7</td>
<td>0.5</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td><em>Felis catus</em></td>
<td>Cat</td>
<td>Maanjor</td>
<td>6</td>
<td>0.43</td>
<td>43</td>
</tr>
<tr>
<td>3</td>
<td><em>Rattus norvegicus</em></td>
<td>Rat</td>
<td>Undir</td>
<td>7</td>
<td>0.50</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td><em>Apis mellifera</em></td>
<td>Honey bee</td>
<td>Mhova moose</td>
<td>14</td>
<td>1.00</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td><em>Homo sapiens</em></td>
<td>Human</td>
<td>Manis</td>
<td>12</td>
<td>0.86</td>
<td>86</td>
</tr>
<tr>
<td>6</td>
<td><em>Bos taurus</em></td>
<td>Cow</td>
<td>Gaay</td>
<td>11</td>
<td>0.79</td>
<td>79</td>
</tr>
<tr>
<td>7</td>
<td><em>Hystrix indica</em></td>
<td>Indian porcupine</td>
<td><em>Sal</em></td>
<td>11</td>
<td>0.79</td>
<td>79</td>
</tr>
<tr>
<td>8</td>
<td><em>Urva auropunctata</em></td>
<td>Mongoose</td>
<td>Mungus</td>
<td>8</td>
<td>0.57</td>
<td>57</td>
</tr>
<tr>
<td>9</td>
<td><em>Varanus bengalensis</em></td>
<td>Monitor lizard</td>
<td>Saanp</td>
<td>10</td>
<td>0.71</td>
<td>71</td>
</tr>
<tr>
<td>10</td>
<td><em>Pheretima posthuma</em></td>
<td>Earthworm</td>
<td>Gayndol</td>
<td>9</td>
<td>0.64</td>
<td>64</td>
</tr>
<tr>
<td>11</td>
<td><em>Bos gaurus</em></td>
<td>Gaur</td>
<td>Gavo redo</td>
<td>7</td>
<td>0.5</td>
<td>50</td>
</tr>
<tr>
<td>12</td>
<td><em>Pavo cristatus</em></td>
<td>Peacock</td>
<td>Mar</td>
<td>7</td>
<td>0.5</td>
<td>50</td>
</tr>
<tr>
<td>13</td>
<td><em>Rusa unicolor</em></td>
<td>Sambar</td>
<td>Meru</td>
<td>5</td>
<td>0.36</td>
<td>36</td>
</tr>
<tr>
<td>14</td>
<td><em>Moschiola indica</em></td>
<td>Mouse deer</td>
<td>Pisoj</td>
<td>8</td>
<td>0.57</td>
<td>64</td>
</tr>
<tr>
<td>15</td>
<td><em>Hoplobatrachus tigerinus</em></td>
<td>Indian bull frog</td>
<td>Bebo</td>
<td>9</td>
<td>0.64</td>
<td>64</td>
</tr>
<tr>
<td>16</td>
<td><em>Lepus nigricollis</em></td>
<td>Indian hare/Rabbit</td>
<td>Soso</td>
<td>8</td>
<td>0.57</td>
<td>57</td>
</tr>
<tr>
<td>17</td>
<td><em>Panthera tigris</em></td>
<td>Tiger</td>
<td>Vagh</td>
<td>4</td>
<td>0.29</td>
<td>29</td>
</tr>
<tr>
<td>18</td>
<td><em>Ahaetulla nasuta</em></td>
<td>Vine snake</td>
<td>Hariyali</td>
<td>5</td>
<td>0.36</td>
<td>36</td>
</tr>
<tr>
<td>19</td>
<td><em>Hottentotta tamalus</em></td>
<td>Scorpion</td>
<td>Vinchu</td>
<td>8</td>
<td>0.57</td>
<td>57</td>
</tr>
<tr>
<td>20</td>
<td><em>Sus scrofa</em></td>
<td>Wild Boar</td>
<td>Rann dukkar</td>
<td>7</td>
<td>0.49</td>
<td>4.9</td>
</tr>
<tr>
<td>21</td>
<td><em>Manis crassicaudata</em></td>
<td>Indian pangolin</td>
<td>Theryo</td>
<td>5</td>
<td>0.035</td>
<td>3.5</td>
</tr>
<tr>
<td>22</td>
<td><em>Columba livia</em></td>
<td>Pigeon</td>
<td>Parvo</td>
<td>8</td>
<td>0.57</td>
<td>5.7</td>
</tr>
<tr>
<td>23</td>
<td><em>Meretrix meretrix</em></td>
<td>Clams</td>
<td>Tisryo</td>
<td>8</td>
<td>0.57</td>
<td>57</td>
</tr>
<tr>
<td>24</td>
<td><em>Lissemys punctata</em></td>
<td>Indian flap shell turtle</td>
<td>Kasov</td>
<td>9</td>
<td>0.64</td>
<td>64</td>
</tr>
<tr>
<td>25</td>
<td><em>Cirrhinus mirgala</em></td>
<td>Mrigal carp</td>
<td>Mori</td>
<td>6</td>
<td>0.43</td>
<td>43</td>
</tr>
<tr>
<td>26</td>
<td><em>Crematogaster subnuda</em></td>
<td>Acrobat ant</td>
<td>Huran</td>
<td>3</td>
<td>0.21</td>
<td>21</td>
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<tr>
<td>27</td>
<td><em>Channa striata</em></td>
<td>Murrels</td>
<td>Chikalo</td>
<td>10</td>
<td>0.71</td>
<td>71</td>
</tr>
<tr>
<td>28</td>
<td><em>Charybdis goaensis</em></td>
<td>crab</td>
<td>Kurli</td>
<td>5</td>
<td>0.36</td>
<td>36</td>
</tr>
<tr>
<td>29</td>
<td><em>Hirudinaria granulosa</em></td>
<td>Leech</td>
<td>Kanti</td>
<td>7</td>
<td>0.5</td>
<td>50</td>
</tr>
<tr>
<td>30</td>
<td><em>Paraechinus micropus</em></td>
<td>Indian Hedgehog</td>
<td>Thekud</td>
<td>9</td>
<td>0.64</td>
<td>64</td>
</tr>
<tr>
<td>31</td>
<td><em>Gallus gallus domesticus</em></td>
<td>Hen Chicks</td>
<td>Kombdhi</td>
<td>9</td>
<td>0.64</td>
<td>64</td>
</tr>
<tr>
<td>32</td>
<td><em>Spilopelia chinensis</em></td>
<td>Spotted dove</td>
<td>Kovda</td>
<td>8</td>
<td>0.57</td>
<td>57</td>
</tr>
<tr>
<td>33</td>
<td><em>Sepia officinalis</em></td>
<td>Cuttle fish</td>
<td>Maanki</td>
<td>9</td>
<td>0.64</td>
<td>64</td>
</tr>
</tbody>
</table>
highest knowledge shared followed by 55-65 years and lowest was with respondent age of 35 - 45 years.

In this study, we reported total of 33 species of medicinal animals and their products used to treat about 42 different human ailments. Animals from the classes of mammals, reptiles, birds, arthropods, and annelids make up the majority of the species used for ethno zoological medicinal purpose. According to this finding, the choice of treatments is influenced by the accessibility and faunal diversity of the area. Insects are easily available and highly used remedies and mammals are the second most used zoo therapeutic animals (Borah et al., 2017). However, in some reports, mammals are among the main group of animals used in folk medicine (Kendie et al., 2018). In the present study, Mammals are the most commonly used animal group as compared to others, possibly they are the most domesticated animal group by the local people of the study area and arthropods are second important.

This study revealed that in many cases the same animal species were used for the treatment of more than one ailment conditions and vice-versa. For examples Cow’s urine and milk is used to cure weakness due to fever, stomach pain, diabetes, diarrhoea. According to the study, traditional animal medicine was administered through eating (meat of Mouse deer to cure vaginal discharge), drinking (milk of Gaur for weakness), massaging or applying (bile of Monitor lizard for sudden paralysis), tying (meat of peacock is used to treat paralysis), pouring (blood of vine snake is used to treat ear ache). The oral application method was used to treat the most prevalent disorders in the study area. Similarly, other studies also reported the oral application as the most commonly used administration of medicinal animals (Yirga, 2011; Mahomoodally et al., 2019; Abebe et al., 2022)

After naturally drying, burning, crushing, powdering or making paste by rubbing it on stones, boiling/cooking to extract oil and other preparation techniques like collecting, direct use were used. Some parts of animals such bones, feather, teeth were believed to be medicine by tying on the neck, leg or other parts of human body. In most of the medicine preparation do not need any additive substance like water, coconut oil and water, tender leaves of guava and cashew, etc. While some need various substances to be beneficial for human diseases. For example, the entire scorpion is cooked in coconut oil to extract the oil, which is then administered topically to the troublesome area of ear ache and foot crack. Similarly, it is reported in some medicinal preparation, both plants and animals are utilized in combination (Alves et al., 2009; Costa Neto, 2011). Cow’s urine is mixed with guava tender leaves to cure jaundice, diabetes. Also cashew tender leaves is added in cow’s milk to treat weakness due to fever, stomach pain. Most of the animal’s parts like dried bone, meat, scales, are rubbed with water to make paste or liquid medicine for applying to affected area or for oral administration.

Tribal communities of Goa are living in remote areas, close to forest areas. Most species were used by the Velip community as their traditional remedies. From this survey, we found that Velip community tribes interact more with one another and share their knowledge with each other’s. As a result, Tribes can still explain these traditional medicines. Only conventional treatments derived from plants and animals were thought to be employed by them because there were no modern medicines available to them, these were their sole options for treating the majority of ailments.

From the study it is revealed that tribal communities in Goa mostly use plant medicines than the animal medicines. They also mentioned that their oldest family member, a traditional healer, used to treat patients with life-threatening illnesses including tuberculosis and asthma with both plant and animal medicines. However, after the forest department outlawed hunting, people started going to the doctor and using the prescribed medicines. They had to visit a pharmacy or the healthcare system these days,
even for cold or cough illnesses. Similar observations were reported from the Valaiyan community of Piranmalai hills (Reserved forest), Tamil Nadu (Santhya et al., 2006).

In Velip communities, mammals and aves make up the majority of the species of vertebrates because there is a large population of mammals in study areas, and such species were regarded as having the best medicinal values. Amphibians are the least number of medicinal animal species used in these tribes, may due to less population in the study area. Fidelity level demonstrate the percentage of respondents claiming the use of certain animals or its product for the same ailments. In the present study, the fidelity level values range from 33% to 100%.

Use-value indicates the relative importance of a species cited by the informants (Alves, 2009). The present study reported Honeybee (Apis mellifera) as the commonly (%UV = 100%) cited medicinal animal and Indian Pangolin (Manis crassicaudata) with %UV=3.5% as a least common cited medicinal animal in Velip community.

Preparation of different remedies to treat different ailments from the different parts of a single animal species is related to the higher use value of some medicinal animals (Jaroli et al., 2010) Additionally, tribes revealed that they tie wild boar and tiger teeth around their necks with threads to shield themselves from malevolent gazes. They also use wild boar hair for the same. In addition to using animal resources for medical purposes, tribes sometimes use them for other purposes, like as decorating their traditional homes. This type of decoration is also reported from other part of India.

The majority of the medicinal animal species are disappearing, according to the informants, as a result of deforestation and overuse. Slaughtering the animal species to collect the blood, meat or different body parts which were commonly used to prepare most of the medicinal remedies is associated with the loss of medicinal animals. The present study revealed that the attempt of conserving animals from extinction in the study area was rare. Similar observations were made by several researchers in the past (Abebe et al., 2022). To prevent animal extinction, traditional knowledge should be included into conservation measures. More research is needed to emphasize more sustainably using these resources as well as to confirm the presence of bioactive compounds in these traditional medicines (Das, 2015). From the present investigation it is evident that the traditional zoo therapeutic remedial measures followed by the native tribal communities of Goa play a crucial role in their primary healthcare. It is very beneficial to record this indigenous knowledge of animal-based remedies in order to develop strategies for the sustainable management and conservation of bio resources, as well as to open the door to the development of human health.

**Conclusion**

This study demonstrated the persistence of Tribal medicine practices in south Goa. The tribal and rural communities are still dependent on indigenous knowledge for health care which is influenced by culture and socio-economic aspects, providing a cheaper and accessible alternative to the high cost pharmaceutical remedies. This is a baseline data for future studies of ethno zoological aspects of medicinal animals. The studies concerning this subject are scarce. More scientific studies are necessary to preserve the popular medicinal knowledge which is important to enhance our understanding of the relationship among men, society and nature, and also to elaborate more effective strategies for conserving natural resources.

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**References**


