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# ETHNOZOOLOGICAL STUDIES ON THE TRIBALS OF PALAKKAD AND MALAPPURAM DISTRICTS OF KERALA, SOUTH INDIA

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**ABSTRACT OF PROJECT PROPOSAL**

**Project Number:** KFRI 427/2004

**Title:** Ethnozoological studies on the tribals of Palakkad and Malappuram Districts Of Kerala, South India

**Objectives**:

- To collect information of the species of animals utilized by various tribal groups for edible and non-edible purposes.
- To study the methods of utilization of the species.
- To assess the sustainability of the methods.
- To formulate a strategy and action plan for the conservation and utilization of animal resources in a sustainable manner.

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## Appendix I

## ABSTRACT

During the last half century, ethnobiology has emerged as a valid discipline that can play a very prominent role in the advancement of many aspects of scientific, sociological and historical studies. The Indian sub continent represents one of the greatest emporia of ethnobiogical wealth and the Western Ghats represents the second hot spot in India. In Kerala, there are about 3 lakh tribals, who continue to use various wild and domesticated animals and plants for food, drugs, customs, game and religious purposes etc. In Palakkad ten tribal groups and in Malappuram six groups were observed. They hunt the animals for bare necessity without tilting the balance of the ecosystem to provide their dietary system with needed nutritive value for the sustenance of life. The tribals are hardly selective in their animal food except to those animals related to religious belief, folklore and myths and this varies widely from one community to another. On the other hand, some of the common animals like wild boar, chital, sambar, cow, monkey, tortoise, frog, crab, prawn, insects, molluscs, etc., by or at the behest of non-tribals, are in great demand. As regards to use of animals drugs, there are remarkably similar practices among the tribals depending on the availability of specific animals around their habitats. This indicates indirectly the authenticity of usage of such drugs that evolved through ages in the health care systems of the tribals. About 108 species of animals have proved to be the vital source of tribal medicine. Of these, 16 species are invertebrates like insects, crustaceans, arachnids, molluscs, etc., and 60 are vertebrates, which include six species of Pisces, one species of Amphibia, five species of Reptiles, sixteen species of aves and and twentynine species of mammals,

etc. The invertebrates are generally used as whole, while in case of vertebrates, the body parts, tissues, exoskeletons, flesh, blood, bile, fat, bones, gastrointestinal tracts, etc. are used. Likewise animal products such as honey, egg, milk, spider net, urine and faeces are of vital value in curing many diseases. The diseases cured with the help of animal drugs include tuberculosis, rheumatic and joint pain, asthma, piles, pneumonia, night blindness, impotency, paralysis, weakness, cholera, body ache, etc. Different body parts of various animals are widely used by tribals for a variety of domestic purposes: dry shell of *Unio* for scrapping, hairs of bear and horse for making rope, brush, coral for musical instruments, teeth of elephant for making bangles, etc. As information on the species of animals utilized by tribal groups, method of utilization, sustainability of methods, etc. is important for the formulation of a strategy and action plan for the conservation and utilization of animal resources in a sustainable manner, various ethnozoological remedies and various end uses have been documented.

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# Chapter 1

## INTRODUCTION

Ethnobiological knowledge is very ancient in India. Ethnobiology describes how people of a particular culture and region make use of indigenous plants and animals. Tribal communities are mainly the forest dwellers who have accumulated a rich knowledge of forests and forest products over centuries. India possesses a total of 427 tribal communities (Chandra Prakash Kala, 2005). Ethnobiological knowledge accumulated over generations help people protect their nutrition and health and manage their habitats (Laird, 2002). The possibility that traditional knowledge may be rapidly and widely lost in response to globalization has become a major concern of scholars and policy-makers (Agrawal, 2002). This concern emerges from the presumed link between traditional knowledge and conservation and development. For example, researchers have said that ethnobiological knowledge related to the habitat or traditional ecological knowledge, contributes to ecological adaptation and might help to design policies for conservation. The loss of traditional ecological knowledge concerns policy-makers because it represents the irreversible loss of information about different ways to manage natural resources.

Traditional ecological knowledge and ethnobiological studies have attracted researcher's interest since the beginning of the nineteenth century. The initial interest focused in documenting how native people classified their environment. By the mid-1980s, the international recognition of the potential value of traditional knowledge generated increasing interest in the topic (WCED, 1987). At that point researchers

shifted their interest from documenting how people classified their environment to study how traditional knowledge contributed to human adaptation. Traditional knowledge resembling scientific knowledge developed through inductive methods and it contribute to the conservation of biological diversity, agriculture, health, nutrition and the management of natural resources. Despite the growing interest in the topic, there has been little and fragmented quantitative research about the causes and rate of loss of traditional knowledge. Although some researchers have linked the loss of traditional knowledge to the expansion of the market economy (Victoria Reyes-García *et. al*., 2005a), others have found persistence in traditional knowledge despite large socio-economic changes (Zarger and Stepp, 2004). The debate matters for policy because proving that integration to the market erodes traditional knowledge would hamper the possibility of simultaneously achieving conservation of traditional knowledge and economic development. The finding would mean that economic development comes at the cost of losing human's heritage and diversity. The finding would help operationalize forms of development based in local capabilities.

Quantitative research on the loss of traditional knowledge has focussed on new knowledge and varies by demographic, social, and economic characteristics of subjects. The research has produced both consistent and conflicting results. Researchers have consistently found that knowledge of natural resources depends on demographic characteristics of informants, such as age, sex, kinship relations, ethnicity, and position in a social network, and on distance from cities or natural resources (Victoria Reyes-García *et. al*., 2005a; Begossi and Braga, 1992). Consistent negative correlation occurs

between traditional ecological knowledge and modern skills associated with acculturation, such as schooling, academic skills, and fluency in the national language due to the impact of acculturation on traditional ecological knowledge (Benz *et. al.*, 2000). The effects of integration to the market on traditional knowledge have also studied. Orthodox thinking in anthropology and in economics predicts that traditional ecological knowledge will vanish as economic development unfolds. Traditional knowledge need not always wane with modernization. In fact, the empirical literature on the effects of integration to the market on traditional ecological knowledge has produced conflicting and weak results. Integration into the market through the sale of crops and wage labour correlates with less knowledge of wildlife, but integration into the market through the sale of forest goods correlates with more knowledge of wildlife. Others find no erosion of traditional ecological knowledge. Local knowledge of the environment can increase with new economic activities based on the environment. In a study in a shrimp community in coastal Ecuador, Guest (2002) found controlling for time of residence in the region, villagers working in the shrimp industry. In sum, previous empirical studies on the link between integration to the market economy and erosion of traditional ecological knowledge have produced conflicting and weak results. Later we argue that part of the answer to the puzzle may lie in the way researchers have defined and measured traditional ecological knowledge.

Ethnoecology deals with the study of local people's interaction with the natural environment including sub disciplines such as ethnobiology, ethnobotany, ethnoentomology and ethnozoology. Ethnobiology must have been the first knowledge,

which the early man had acquired by sheer necessity, intuition, observation and experimentation. Factors like geographical isolation, uniqueness of the habitat, genetic differences etc. affect a particular human population of an area in acquiring skills, developing concepts, techniques for earning subsistence, etc., which lays base stone in the ethnoecology. The knowledge gained by the local people of a particular area is generally acquired through generations by direct interaction with nature. Hence this orally transmitted information of a particular community is not rigid but renewed continuously by time.

The use of cultural consensus to analyze data on traditional ecological knowledge has been used by several authors and is becoming a recognized method to measure variation in individual's traditional ecological knowledge. We also used another measure of traditional ecological knowledge that focuses on empirical, rather than on theoretical knowledge: self-reported ethnobiological skills. We use this new variable because skills capture the practical dimension of ethnobiological knowledge. The loss of traditional ecological knowledge might affect ethnozoological skills before affecting theoretical ethnozoological knowledge. Integration to the market economy is recent in many traditional societies. If economic development erodes ethnobiological knowledge by enabling people to gain access to substitutes for plant and animal products, then we would expect to see economic development producing an effect on the skills to manufacture products from animals before producing an effect on theoretical knowledge.

It is estimated that more than 300 million indigenous people live in more than 70 countries in habitats ranging from Artic to the rain forests of Asia. China and India together have 150 million indigenous tribal people. Over 53 million tribals belonging to 550 tribal communities representing 227 linguistic groups inhabit the Indian subcontinent. At least 5000 indigenous groups can be distinguished by linguistic and cultural differences and by geographic separation. These tribal populations depends the local vegetation for food, shelter and curing most ailments. The wide range of ecotypes or cultivars of crops existing within these under exploited or less modernized tribal form offers a solution for the erosion of genetic diversity also. The tribal communities are spread over varied geographical regions and climatic zones of the country. Their way of living varies from hunting - gathering, cave dwelling nomadics to societies with settled cultures. They live in a symbiotic relationship with the forests and so in harmony with the ecosystem. A central point of all local health traditions of the tribals and their practitioners is their independent and self-sufficient nature.

Over the past three decades, the global environmental crisis has led to a belated acknowledgment that man is part of nature, a new paradigm challenging biological and ecological research, which has, in the past, tended to consider natural objects as totally independent of any social or political sphere. The Earth Summit in Rio de Janeiro in 1992, through the Convention for Biological Diversity (CBD), firmly acknowledged the role of indigenous knowledge in biodiversity conservation, especially under Article 8j, thus promoting its use as a new norm in environmental management. Since then, academics and decision-makers have emphasized the value of local knowledge in

determining the co-viability of social and ecosystem dynamics and in informing the design of people-centered resource management approaches (e.g. Cunningham, 2001). The importance of ethnobiological knowledge (we consider here ethnozoology, ethnobotany and ethnoecology as different subjects of the overall discipline known as ethnobiology) for suggesting new paths in scientific research, for conservation monitoring or for understanding ecological processes, has received much attention in resource management. International agencies such as the World Wildlife Fund (WWF) and UNESCO, in the context of their joint program, the People and Plants initiative, have also promoted research on ethnobotanical knowledge, as well as integration of people's perceptions and practices in resource management at the local level (Cunningham, 2001). Incorporation into biological and ecological studies of local-use patterns and of the social and institutional background that guides the relationships between people and nature, has led to a greater understanding of the relationship between social and ecological dynamics.

The dialectical relationship between ethnobiological knowledge and local practices shapes the ecosystem and affects its constituent plant and animal populations. In the context of community-based projects, global perceptions of biodiversity conservation and scientific understanding of ecosystem dynamics are confronted with local communities' knowledge of, perceptions of, and values associated with the different components of the ecosystem. Local knowledge and practices have to be analyzed and understood so that appropriate management practices that build on both scientific and local knowledge can be developed. Recent studies also show that local

knowledge and practices have certain similarities to complex adaptive systems, having the capacity to deal with uncertainty and to respond to ecosystem change. By incorporating local knowledge and practices in the process of scientific research, new hypotheses can be developed for research experiments relevant to management. A longer-term objective of our work was thus to use results of our ethnobiological studies to develop new sets of hypotheses for ecological research in order to test the effect of variation in knowledge and practices on the ecology and conservation of threatened species. Living close to nature they have acquired a unique and specific knowledge especially concerning the local flora and fauna and their use in medicine. This knowledge is mostly unknown to the outside world. Because large number of people are involved and of the independent identity of the tribes, the amount of information available is immense.

Traditionally, ecologists have dealt with ecosystems as a biophysical concept, with humans impacting upon from outside and bringing about a whole range of alterations in the process although ecological thought had a more integrated beginning as human ecology. There are about 35 tribal communities in Kerala with a population of about 3 lakhs forming about 1 percent of the total population of the State. Majority of them inhabit in and around the Western Ghat forests, one of the 25 biodiversity 'hotspots' in the world and the second one in India. The present study is confined to the Malappuram and Palakkad Districts of Kerala, S. India and the main tribal groups are Mudugas, Irulas, Malasar, Kadar and Cholanaikans, the most primitive group in Kerala.

Medicare systems of traditional communities of Kerala particularly the tribals are now getting worldwide attention. Ethnobiological studies conducted in India had resulted in the identification of 76 animal products and 7500 plant species used in tribal medicine (Anonymous, 1993).

Wildlife has always been used by the human society for its survival. The use has been for edible and non-edible products, other than as a source of recreation. The Wildlife, in all its forms, from the mammals to the invertebrates, have also been used for its various end uses like food (e.g. bats, rats, deer, wild boar, etc.), medicine (e.g. civet, cat, bats, nilgiri langur) for the trade in parts or whole (e.g. civet, lion tailed macaque, mongoose, shrews, etc.) and for non-edible purposes like ornaments, clothing, tools and in religious functions also. These associations have to be evaluated in terms of the cultural, aesthetic, medicinal, economic and on social values.

The recent thrust on biodiversity conservation and sustainable utilization has generated interest on the traditional use of the resources. Radhakrishnan and Pandurangan (2000) have briefly dealt with the role of tribal medicine in the local health care. However, there had not been any concerted effort to document the traditional use of animals for food, medicine and other purposes in the State. There is also no information available on the methods of utlisation indicating whether the use is sustainable. The biodiversity in the universe is said to be declining due to various reasons like loss/fragmentation of habitats, population pressure, shortening resource base, increasing demand, etc. Many species of animals and animal products/derivatives are declining gradually and many species are categorized as endangered or threatened

(Easa *et. al*., 2001). The present pilot study is to document the traditional use of animals for various purposes and the methods used will contribute to the knowledge of science and formulating strategies to conserve the species without affecting the cultural heritage and diversity of tribal communities.

During the last half century, ethnobiology has emerged as a valid discipline that can play a very prominent role in the advancement of many aspects of scientific, sociological and historical studies. An increasing number of investigations have been done to the vast store of knowledge of plant properties and uses, still intact in native cultures in several parts of the world and comparatively less concentration on ethnozoological studies. The Indian subcontinent represents one of the greatest emporia of ethnobiogical wealth and Western Ghats represents the second 'hot spot' in India. In Kerala, many living groups of tribals of about 3 lakhs, still more or less isolated from the influence of modern world, and who continue to use various wild and domesticated animals and plants for food, drugs, customs, game and religious purposes etc. They hunted the animals for bare necessity without tilting the balance of the ecosystem, provided their dietary system with needed nutritive value for the sustenance of life. Animals including birds have so far been proved as quite useful source of food to the tribals in different areas of the country depending upon their availability. It is generally observed that the tribals are hardly selective in their animal food except to those animals related to religious belief, folk lore and myths and this varies widely from one community to another. On the other hand, some of the common animals like wild boar, chital, sambar deer, cows, monkey, tortoise, frog, crab, prawn, insects, molluscs etc. are

by or at the behest of non-tribals or in great demand. The tribal communities of our country generally use wide varieties of medicines derived from both invertebrate and vertebrate animals. As regards to use of animals drugs, there are remarkably similar practices among the tribals depending on the availability of specific animals around their habitats. This indicates indirectly the authenticity of usage of such drugs that evolved through ages in the health care systems of the tribals.

The data collected through various ethnozoological exploration methods and the materials including photographs, films, raw drugs etc. are to be protected from deterioration at the same time the data must also be protected from misuse by other people. Simultaneously the data collected should be protected through the Intellectual Property Rights (IPR).

Ethnozoologists have traditionally directed their efforts towards one or two goals. Economic biologists sought to discover new natural products of commercial value, often for the benefit of the developed world, whereas ethnoscientists focused on achieving a theoretical understanding of how people perceive and manage the environment. Since the late 1960s, many ethnozoologists, building upon and modifying these early goals, have directed their attention to applying the results of their research to conservation and development problems. The community projects in which they participate have various goals, including return of the research results to host communities, strengthening traditional systems of agricultural production, encouraging rational use of animals in health care and promoting traditional ecological knowledge.

In the relatively new scientific field of ethnozoology, animal scientists work with tribes, farmers, and ethnic healers to study how local plants are utilized in their day-to-day endeavours. While they have been concerned mainly with cataloging these plants, contemporary ethno botanist more collaborating with chemists to analyze the compounds in these plants; with agriculturists and foresters to introduce new crops; and with anthropologists to gather more information on traditional cultures. The new synthesis in ethnozoology has generated a vast array of indigenous knowledge that is very much relevant to the conservation of biodiversity and the sustainable use of plant resources.

Briefly, ethnozoological exploration and documentation among the ethnic groups are the need of present era where chances of cultural mixing up and adoption of modern technologies in all fields of life is happening. Due to the rapid globalization it is evident that the erosion rate of knowledge base among the tribal people is also high and chances for getting the knowledge documented for the welfare of entire humanity.

With this background, ethnozoological studies were conducted in the tribals of Palakkad and Malappuram with the following objectives:

- To collect information of the species of animals utilized by various tribal groups for edible and non-edible purposes
- To study the methods of utilization of the species
- To assess the sustainability of the methods
- To formulate a strategy and action plan for the conservation and utilization of animal resources in a sustainable manner

# Chapter 2

## STUDY AREA

The State of Kerala is situated between $8^{o}$ 18' and $12^{o}$ 48' N latitude and $74^{o}$ 52' and $77^{o}$ 22' E longitude (Fig. 1). It is located in the southernmost corner of India bordered by Arabian Sea in the west, Indian Ocean in south, Tamil Nadu in the east and Karnataka in the north. The state is 38,864 $km^2$ in extent spread over 14 districts and is just 1.8 per cent in size of the Indian subcontinent. The study area includes two districts, Malappuram (Fig. 2) and Palakkad (Fig. 3).

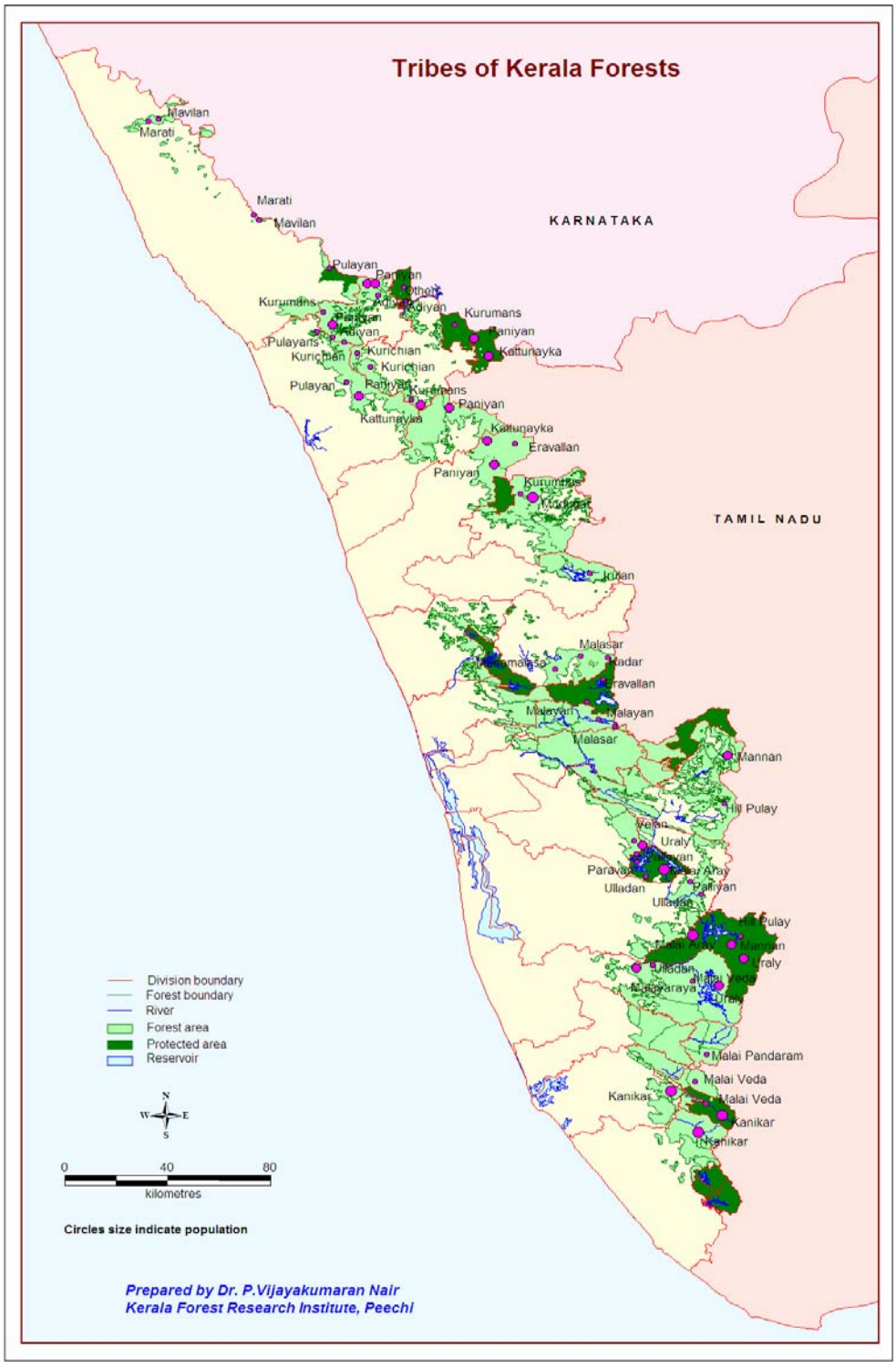


Fig. 1. Kerala State

## MALAPPURAM DISTRICT

With Nilgiris in the east and the Arabian Sea in the west, Malappuram district presents a treat to the eye. Rich and evergreen forests, hills and dales, rivers and brooks, sandy surfs and palm fringed coasts, festive mood of the joyful Oonapattu – the district preserves the cultural wealth of the good old days. It has in store, a hoary past with Zamorins rule, Mamankam festival, Vellattiri's revenge and the resultant Chaver Pada (Suicidal squad), the British rule and indiscriminate oppression of the masses in connivance with exploiting landlords, the National and the Khilaphat movement, the Malabar rebellion and such.

The land of great poets and writers, political and religious leaders, this district has carved a place of its own in the history of Kerala. The kings of Valluvanad, the Zamorins, the Kings Perumbadappu Swarupam and the kings of Vettathunadu were the early rulers. Portuguese Mysore sultans and the Britishers had their sway over this place, partly or wholly but the unique social and cultural heritage is preserved.

## GENERAL FEATURES

Amalgamating the distant and backwater areas of the Kozhikode, Perinthalmanna and Ponnani taluks of Palakkad, Malappuram District was formed on the 16$^{th}$ of June 1969. The Nilgiris of Tamil Nadu in the east and the Arabian Sea in the west, provide natural boundaries. In the north it is bounded by Kozhikode and Wayanad and in south by Palakkad and Thrissur districts. The district has a geographical area of 3350 sq. km., which is 9.13 per cent of the total area of the state. With regard to the area, Malappuram district ranks third in the state, the first and second being Palakkad

and Idukki, respectively. The Ernad taluk of the district is the biggest in the state with an area of 2176.63 sq. km., which is nearly as much of Thiruvananthapuram district (2192 sq. km.) and 1½ fold of Alappuzha district (1414 sq. km). This taluk has been divided into two, Ernad and Nilambur.

The district has a total forest area of 103417 hectares i.e. 28.47% total geographical area. The major forest area is concerned in Nilambur, Wandoor and Melattur in the Western Ghats. Of the forests, 80% is deciduous and the rest is evergreen. Teak, rosewood, venteak, Mahagoni, etc. are the important trees. Other varieties like Kulamave and Vellapine are used in the plywood industry. Bamboo is extensively grown in all parts of the forests. The district has also several man-made plantations, mainly of teak. Afforestation is also being done under the Wastelands Development Program.

Elephant, deer, tiger, bear, monkey, wild boar, hare etc. are found in the forest along with an array of birds and reptiles. Forests are the main source of raw materials for a number of wood based industrial units. Besides, timber, firewood and green manure, forest products like honey, medicinal herbs, spices, etc. are collected. The tribals collect minor forest products. A girijan society functions for ensuring fair prices for collected items and for arranging supply of essential commodities to the tribal families. Bamboo for pulp factories is mainly supplied from Nilambur Forests.

According to 2001 census, the district has a population of 36,29,640, which is 11.40 per cent of the total population of the state. Of the total population, 17,59,479 are males and 18,70,161 are females forming a ratio of 1063 females for every 1000 males,

the state being 1058 females for 1000 males. The density of population is 1022 sq. km., which is higher than the state average (819 sq. km.). The district has recorded a population growth rate of 17.22, which is the highest in the state, the state growth rate being only 9.42. Malappuram district ranks third in area and first in population in the state. However, the population growth rate from the decade recorded a slight decline. Literacy as per 2001 census is 88.61 per cent (males 91.46 per cent; females 85.96 per cent).

**TRIBAL DEVELOPMENT**

Scheduled Tribe population in the district is 10,555. Muthuvan, Malamuthan, Paniyan, Arnadan, Kuruman, Kattunaikan and Cholanaikkan are tribal communities in Malappuram District. Of these, Kattunaikan and Cholanaikan are the most primitive tribes. There are 184 tribal settlements stretched in the hill ranges of Ernad taluk. Housing schemes are the main development programs undertaken for the tribes. Integrated Tribal Development Project (ITDP) office at Nilambur is implementing the program.

Kaatunaikkans are considered as aboriginal race of the state. The dialect of Kattunaikans is a mixture of southern languages. They have several other names like kadu, jenu or tenkurumans. The meaning of kattunaikan is ‘king of jungle’. Chola naikan is a sub group of kattunaikans. They live in rock shelterscalled ‘Kallualai’ or in open campsites made of leaves. Their language is a mixture of Kannada and Tamil. Cholanaikans are foun in groups, consisting of 2 – 7 primary families and each group is called *chemmam*. They call kattunaikans as pathinaikans.

**Fig. 2 Malappuram district**

## PALAKKAD DISTRICT

Palakkad is one of the fourteen revenue districts of Kerala. Its geographical position, historical background, rural nature, educational status, tourist attractions and above all, the developmental activities are wide and varied.

This district, situated almost in the centre of the State, has no coastal line. The district opens the State to the rest of the country through the Palakkad gap. This 32 to 42 km. wide natural gap in the 960 km long Western Ghats is perhaps the most influential factor for the unique characteristics of the district such as climate, commercial as well as cultural exchanges between the State and the rest of the country. Palakkad witnessed invasions of historical importance that have left indelible impressions on the history of Kerala. Bharathapuzha, the longest river in Kerala, originates form the highlands and flows through the entire district. Forests, numerous streams, several dams and the gardens have made this district a tourist paradise.

The district is one of the main granaries of Kerala and its economy is primarily agricultural. Agriculture engages more than 65 per cent of the workers and 88.9 per cent of the district's population is rural in nature. The proximity and easy approach to Tamil Nadu have caused the admixture of Malayalam and Tamil culture, here.

## GENERAL FEATURES

Based on the physical features, the district is divided into two natural divisions- midland and highland. The midland region consists of valleys and plains. It leads up to the highland that consists of high mountain peaks, long spurs, extensive ravines, dense forests and tangled jungles. While Ottappalam taluk lies completely in the midland region, all other taluks in the district lie in the midland and highland regions. The Western Ghats has an average altitude of 5000ft. except for two peaks of more than 6000ft. The important peaks above an altitude of 4000ft. - are Anginda peak (7628 ft.), Karimala peak (6556 ft.), Nellikotta or Padagiri peak (5200 ft.) and Karemala Gopuram (4721 ft.).

Palakkad district lies between north latitude 10° 46' and 10° 59' and east longitude 76° 28' and 76° 39'. It is bounded on the east by the Coimbatore district of Tamil Nadu, on the north and northwest by Malappuram district and on the south by Thrissur district.

The climate of the district is tropical. The obvious fact, which strikes an observer, according to William Logan, is the uniformity of temperature in the Malabar area. During dry weather, hot winds blow from the plains of Coimbatore through the Palakkad gap. Palakkad district has uniform rainfall as well.

The total population of the district according to 2001 census is 2,617,072 of which the male population is 1,265,794 and female population is 1,351,278. The density of population is 584 per sq.km.

Tribal goups including Irular, Kadar, Malamassar, Paniyar, Kurumbar, etc. are recorded. Kadars are found in the Parambikulam, Kuriyarkutty, Nelliampathy and

Kodassery forest areas. In every settlement a headman, viz, moopan is controlling the social customs. They were nomadic in nature and subsisted mainly on forest produce collections. The custom of chipping of incisor tooth was ommon among Kadars. Kurumbas are seen only in the Attapady block of this district. They were shifting cultivators and food gatherers. They speak a language basically related to Kannada. They also use Malayalam and Tamil. The clan system is of very high order among Kurumbas.

**Fig.3 Palakkad district**

## Chapter 3

## REVIEW OF LITERATURE

Human beings have been using animal resources for therapeutic purposes since ancient times (Weiss, 1947; Rosner, 1992; Unnikrishnan, 1998), where folk remedies were elaborated from parts of the animal body, from products of its metabolism, such as corporal secretions and excrements, or from non-animal materials such as nests and cocoons. This ethnozoological interaction has been recorded both in indigenous and western societies throughout the world (Gudger, 1925; Branch and Silva, 1983; Conconi and Pino, 1988; Begossi and Braga, 1992; Antonio, 1994; van Huis, 1996). Both wild and domesticated animals are useful for therapeutic purposes. The latter are

used especially through pet therapies, such as the employment of dogs, cats, and horses for the treatment and improvement of different kinds of pathological conditions, as for example mental deficiencies. The ample geographical distribution of zootherapy has been such that all human cultures show a developed medical system that will utilize animals as medicines. Such a statement forms the basis of what he has called 'zootherapeutic universality hypothesis'. In this regard, this paper corroborates the hypothesis by recording medicinal animals in northeastern Brazil.

Although surveys centered on medicinal plants are still on the top, the phenomenon of zootherapy has aroused the interest of many researchers from different branches of science who have recorded folk medical systems and sought compounds with pharmacological action (Werner, 1970; But *et. al.*, 1991; Bisset, 1991; Amato, 1992; Lazarus and Atilla, 1993; Chen and Akre, 1994; Rodrígues and West, 1995). But this interest goes farther when one takes into consideration the benefits that animal-derived compounds give in terms of monetary value and human welfare. In 1995 the estimated market value of pharmaceutical derivatives from biological resources was US $43 billion worldwide (Blakeney, 1999). For example angiotensin I, an antihypertensive derived from the Brazilian arrowhead viper *Bothrops jararaca*, brings the Squibb Company US $1.3 billion a year in sales and contributes to the well-being and longevity of millions of peoples (Lovejoy, 1997). Today from 252 essential chemicals that have been selected by the World Health Organization, 11.1% have plant origins, while 8.7% come from animals (Marques, 1996). According to Oldfield (1989), more than 41% of all 1973 over-the-counter prescriptions in the United States contained an active

ingredient derived from wild or cultivated fauna and flora. As she points out, traditional knowledge of medicinal compounds from biota is still one of the most important means for discovery of unknown natural drug resources. In Brazil, animal species have been medicinally used by indigenous society for millennia and by descendants of the European settlers for the last four centuries. An amazing number of about 300 species have been recorded and these can be easily found as commercial items sold by herbalists and healers in marketplaces all over the country (Marques, personal communication, 1996). Considering the State of Bahia, knowledge of medicinal animals and their uses has persisted in many areas today. We could attest that Bahia's usage of medicinal animals has been facilitated over many generations because of the fostered wisdom within the communities as part of the local cultures. In India, the insects are the staple food of the tribals. Among them, beetles, bugs, cockroaches, locust, grasshoppers and crickets, moth butterflies and their larval and pupal stages, ants, bees and wasps are consumed as food. Other animals like rats and snakes, lizards, toads, frogs and snails are used in some other form as food. The crunchy little ants (*Oecophylla smaragdina*) and also some beetles have medicinal value (Mishra *et. al*., 1999). Costa-Neto (1996) has recorded the use of 22 species in the area of the Chapada Diamantina National Park, 49 species in the county of Glória, 16 species in the city of Feira de Santana (1999b), and 55 species in the county of Conde; Costa-Neto and Melo (1998) have recorded the use of 16 insect folk species in the county of Matinha dos Pretos.

Informants have also cited the use of living animals, such as tortoise (*Geochelone* cf. c*arbonaria*). This reptile is reared as a pet. Although considered by

many as superstition, the pertinence of traditional medicine based on animals cannot be denied since they have been methodically tested by pharmaceutical companies as sources of drugs to the modern medical science. As Kunin and Lawton (1996) argue, "The investigation of folk medicine has proven a valuable tool in the developing art of bioprospecting for pharmaceutical compounds." Many studies have confirmed what people have known and employed for centuries. According to McGirk (1998), Brazilian scientists are studying a type of frog that is used to cure intestinal illnesses by members of the Yawanawa Indian tribes on the banks of the Rio Grande. Indeed, amphibians have provided compounds capable of being turned to therapeutic advantage. Peptides extracted from the scraped secretions of *Phyllomedusa bicolor*, for instance, are used in the treatment of depression, stroke, seizures and cognitive loss in ailments such as Alzheimer's disease (Amato, 1992). Some of these compounds are important tools for biochemical research or as new leads for the development of anticancer or antiviral drugs (Lazarus and Attila, 1993). Several other animal-derived compounds of proven efficacy have also been found as observed by Zhang, Guo and Wang (1992), who have studied therapeutic uses of earthworms and found that these animals possess antipyretic, antispasmodic, diuretic, detoxic, antiasthmatic, antihypertensive, and antiallergenic effects. From the plasma of the European hedgehog, Mebs *et. al*. (1996) have isolated erinacin, which is an antihaemorrhagic factor. In addition to this, Oldfield (1989) records that about 4% of the extracts evaluated in the 1970s from 800 species of terrestrial arthropods (insects, crustaceans, spiders, millipedes, and centipedes) showed some anticancer activity.

Even lethal, natural substances can become medicines. The study of viperid, crotalid and elapid venoms has shown the presence of analgesic activity, which, in the case of serpent venoms, is stronger than morphine and therefore, of use in cases of terminal cancer (Bisset, 1991). A more recent development is the introduction of captopril and related substances in the treatment of hypertension. Regarding fish, several compounds have been extracted and these are employed as remedies in the official medicines (Hamada and Nagai, 1995). Oily fish, like cod, herring, salmon, and turbot have a great medicinal value to human beings due to a polyunsaturated compound known as OMEGA-3. This substance helps the prevention of arthritis. The presence of an anticoagulant system in the plasma of Atlantic salmon (*Salmo salar* L.) and rainbow trout (*Oncorhynchus mykiss* Walbaun) has been confirmed, what supports similarities with the protein C anticoagulant system in mammals (Salte *et. al*., 1996). Tetrodotoxin (TTX), a water-soluble guanidinium derivative, is an example of a bioactive compound produced by marine organisms such as puffer fish "that resembles procaine in its ability to inhibit transmission of nerve cells" (Colwell, 1997). When diluted it acts as an extraordinary narcotic and analgesic (Bisset, 1991).

In Tanquinho, people usually do not know that some of the wild animal resources they regularly use are endangered species. Although their hunting, slaughtering and trading have been prohibited by Federal law, since 1967, wild populations continue to be used both nutritionally and medicinally in a clandestine way. Of the total of species recorded, 24 (71%) are not under extinction risk. On the other hand, *Myrmecophaga tridactyla*, *Coendou* cf. *prehensilis*, *Dusicyon* sp., *Mazama* cf.

*americana*, *Rhea americana*, and *Crypturellus noctivagus zabele*, which are officially considered as threatened species were found among the set of faunistic resources prescribed as medicines at the time of this research. At least three species are insufficiently known and thus they are referred as threatened. These include peccaries (*Tayassu tajacu* and *T. pecari*) and tortoise (*Geochelone* cf. *carbonaria*). Also, *Phrynops* is a little known genus that is believed to include threatened species. These animals have become charms and remedies used not only in Tanquinho but also throughout the country. Apparently, these species have not become endangered because of their perceived therapeutic value. The record of 34 medicinal animals in Tanquinho, along with other studies conducted within the state of Bahia and elsewhere in Brazil, represents strong evidence of the traditional use of wildlife resources. According to Silva and Marques (1996), the phenomenon of zootherapy is relevant because it implies additional pressure over critical wild populations.

Oldfield (1989) argues that many animal species have been overexploited as sources of medicines for the folk medicine trade. In addition, she also attests that animal populations have become depleted or endangered as a result of their use as experimental subjects or animal models. For this reason, sustainability is now required as the guiding principle for biological conservation. According to the IUCN draft *Guidelines* (Glowka, Burherme-Guilmin and Synge 1994), the exploitation of a given species is likely to be sustainable if:

Zootherapeutic activity, if properly managed, can be compatible with an environmental conservation program in which the use of natural resources can and must

occur in such a way that human needs and protection of biodiversity are guaranteed. For this reason, zootherapy should be viewed within its cultural dimension (Costa-Neto, 1999b). This cultural perspective includes the way people perceive, use, allocate, transfer and manage their natural resources (Johannes, 1993). Since people have been using animals for a long time, suppression of use will not save them from extinction. In accordance with Kunin and Lawton (1996), those species directly involved in traditional medicines should be among the highest priorities for conservation. They argue that some of the doing otherwise would harm humanity (anthropocentric view). Thus, diversity in nature is of some instrumental value in advancing human interests and well-being, either now or in the future (Costanza and Daly, 1995; Kunin and Lawton, 1996). The second approach debates the issue of biodiversity from a moral point of view by arguing that diversity of life on earth is to be protected independent of any utilitarian reasons (ethical view). Ehrlich and Ehrlich (1992) point out that biotic diversity should be valued for four general reasons: ethical, aesthetical, direct economic, and indirect economic. One may ask, “Could the zootherapeuticals from Tanquinho be viewed from a less anthropocentric perspective and seen as having intrinsic value?” In this regard, Swanson’s statement is agreed (in Oksanen, 1997), that the protection of biodiversity results from the right use of its resources.

Although Aborigines of a particular geographical area have culture and belief system distinct from the international system of knowledge, it is important to learn how they view and interact with their environment to mobilize their knowledge for the design of appropriate intervention. Against the backdrop of worldwide ecological crisis

due to over exploitation of natural resources, it is now recognized that the indigenous people manage the environment without damaging local ecologies and conserve the biological diversity for securing livelihood and sustainable environmental development. Zoo-therapeutic is such a body of indigenous knowledge system built up by a group of people through generations, by living in close contact with nature and using traditional drugs of animal origin in the local environment so that it is specifically adapted to the local people and conditions. This plays a significant role in the healing practices, magic rituals and religions of both indigenous and western societies all over the world (Rosner, 1992).

Although integration of indigenous people with larger societies, growth of national and international markets, imposition of educational and religious systems and various developmental processes lead to the homogenization of world cultures, the contemporary society may benefit from such experience in its fight against disease and sufferings and the established. It is thus, essential to document the various zootherapeutic uses and formulate conservation strategies for animals before these indigenous beliefs, values, customs, know-how and practices are altered and rendered unsuitable, making the knowledge base incomplete. Although quite a relevant contribution in the ethnozoological drugs of vertebrate origin has been made by Joseph (1984) no authentic report is available from Nagaland except for the Chakhesang tribe (Kakati *et. al.*, 2006). This study reports the use of drugs of vertebrate origin practiced by the Ao tribe of Mokokchung district, Nagaland.

# Chapter 4

## MATERIALS AND METHODS

The study was conducted in various tribal settlements of Palakkad and Malappuram Districts and among the nomadic groups also. Information collection was done by questionnaire survey, from Tribal Development Societies, Tribal Physicians, their patients, hunters; information from group-hunting which is done as a part of religious function, traders of animal products/parts. During the period of the survey in both districts, six tribes were observed from Malappuram district (Table 1) and ten tribes from Palakkad district (Table 2). Detailed information on methods of collection, animal parts/products involved in medicine preparation, captive breeding and various end uses were collected and detailed inventory were prepared. Based on this primary

data, secondary data from Wildlife studies in Kerala, from Tribal Development Societies, Forest Department, etc were used as a support. Based on this data, animals and various end uses were documented and decline in the animal resources were estimated. In addition rare and threatened species are identified and recommendations for the sustainable utilization of animal resources are suggested.

**Questionnaire Survey for data collection from tribals (animals, Project KFRI 427/04)**

1. Place (Dist, Village/Range) : Reporter:
2. Tribal group/caste : Date :
3. Name of the respondent/ Householder :
4. No. of members in the family:
   a. Male : b. Female : c. Children :
5. Occupation :
6. Approximate annual income :
7. Educational status :

| Sl. No. | Below metric | Metric | H.Sc | Degree and Above |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| | | | | |

8. Live stock animals in captivity :

9. Health care and medicine :

a. Allopathy b. Ayurvedic c. Oorumoopan (Tribal chief)

10. Animals/parts/derivatives used as medicine:

| Sl.No. | Local name | Scientific name | Animals/parts used | How medicine prepared | How used | Source |
|---|---|---|---|---|---|---|
| | | | | | | |

11. Animals as food :

12. Animals/parts as ornaments :

13. Animal products, waxes, perfumes, oil, honey etc :

14. Animal parts as tools, cloths (skin) etc :

15. Animal parts in culture/religious functions :

16. Animal parts in trade :

17. Animals in captivity/uses :

18. Methods of collection of animals :

a. Sustainable b. Unsustainable

19. Whether decline in resources for the past 10 years?

20. Whether importance of conservation is known?

21. Sustainable utilization recommended or not?

a. Yes b. No

22. Any other information not covered above:

**Table. 1 Tribal groups in Malappuram district and the families surveyed**

| Tribe | Total number of families* | Number of families surveyed | Percentage of survey |
|---|---|---|---|
| Aranadan | 75 | 32 | 53.33 |
| Kuruman | 119 | 40 | 33.61 |
| Kattunaikan | 205 | 61 | 29.75 |
| Paniyan | 2178 | 682 | 31.31 |

| | | | |
|---|---|---|---|
| Cholanaikan | 89 | 42 | 47.19 |
| Muthuvan | 53 | 18 | 33.96 |
| | 2719 | 875 | 32.18 |

* Directorate of Scheduled Tribes Development, Thiruvanathapuram (2002-2003) and Tribal extension office Malappuram.

**Table 2 Tribal groups in Palakkad district and the families surveyed**

| Tribe | Total number of families* | Number of families surveyed | Percentage of survey |
|---|---|---|---|
| Irular | 6414 | 2104 | 32.80 |
| Malassar | 787 | 360 | 45.74 |
| Mudugar | 1233 | 409 | 33.17 |

| | | | |
|---|---|---|---|
| Kattunaikkar | 284 | 85 | 29.92 |
| Paniyan | 121 | 71 | 58.67 |
| Kadar | 72 | 48 | 53.84 |
| Kurumba | 391 | 132 | 33.75 |
| Eravalan | 1496 | 480 | 32.08 |
| Malyarayan | 124 | 69 | 55.64 |
| Malamalassar | 232 | 74 | 31.89 |
| | 11154 | 3832 | 34.35 |

* Directorate of Scheduled Tribes Development, Thiruvanathapuram (2002-2003) and Tribal extension office Palakkad.

## Chapter 5

## RESULTS

During the study survey in the colonies of Malappuram (List 1) and Palakkad (List 2) districts have been done. The lists of the colonies surveyed are are shown. The photos of tribal people and their hut are shown (Plate 1a and 1b). The results of ethnozoological analysis are provided (Chapter 5.1) giving the details of the animals, their notes, uses.

**List 1.**

### Tribal colonies of Malappuram

| Sl No. | MALAPPURAM DISTRICT TRIBAL COLONY | NO. OF FAMILY IN A COLONY | NO. OF FAMILY SURVEYED |
|---|---|---|---|
| 1. | Varedapadum - **Nilambur** | 16 | |
| 2. | Kalepadum | 6 | |
| 3. | Cholasserykunnu | 3 | |
| 4. | Padikunu | 24 | |
| 5. | Vallapuzha | 24 | 12 |
| 6. | Nallamthani | 14 | |
| 7. | Muthiri | 13 | 10 |
| 8. | Mukkersi | 13 | |
| 9. | Chinkakallu | | |
| 10. | Malachi | | |
| 11. | Chakapali | 7 | |
| 12. | Pallikuthu – **Chungathara** | 42 | |
| 13. | Kottepadum | 47 | |
| 14. | Kolumpadum | 15 | |
| 15. | Kunnth | 23 | |
| 16. | Thalanji | 4 | |
| 17. | Kuttimunda | 14 | 11 |
| 18. | Chathamputhuvai | 9 | |
| 19. | Mundappadum | 5 | |
| 20. | Padipoyil | 8 | |
| 21. | Ambalapoyil | 26 | |
| 22. | Thazhepallikuth | 22 | |

| | | | |
|---|---|---|---|
| 23. | Kavumpadam | 8 | |
| 24. | Kanayamkai | 9 | |
| 25. | Mangode | 4 | |
| 26. | Konnampotti | 16 | |
| 27. | Thazheperumbiladu | 5 | |
| 28. | Mathayil colony | 3 | |
| 29. | Vellampadum | 9 | |
| 30. | Annadappu colony | 4 | |
| 31. | Pudupariyarum | 7 | |
| 32. | Padinjattupadum | 25 | |
| 33. | Konnamanna | 18 | |
| 34. | Cheerakuzhi | 24 | |
| 35. | Nariyampoyil | 11 | |
| 36. | Kattilepadum | 7 | |
| 37. | Chathamunda | | |
| 38. | Vellampadum | | |
| 39. | Sulthanpadi | | |
| 40. | Manali | | |
| 41. | Pulikkadu | | |
| 42. | Kurathi | | |
| 43. | Palakkayam – **Chaliyar** | 13 | |
| 44. | Abumala | 21 | |
| 45. | Vettilakoli | 24 | |
| 46. | Kallunda | 20 | |
| 47. | Vylasseri | 21 | |
| 48. | Peruvambadam | 55 | |
| 49. | Chettiyampara | 8 | |
| 50. | Kombankolli | 8 | |
| 51. | Perumbathur | 30 | |
| 52. | Kanakuth | 9 | |
| 53. | Plakkanchola | 15 | |
| 54. | Puthupetty | 20 | |
| 55. | Parakkadkurumba | 16 | |
| 56. | Kunnthchal | 24 | |
| 57. | Piengakode | 18 | |
| 58. | Perumunda | 18 | |
| 59. | Myladi | 7 | |
| 60. | Panapoyil | 12 | |
| 61. | Modavanna | 8 | |
| 62. | Namboothiripotti | 8 | |
| 63. | Parakkad edavanna | 29 | |
| 64. | Akbadam | 11 | |
| 65. | Peruvabadam | 7 | |

| | | | |
|---|---|---|---|
| 66. | Vennekode | 12 | |
| 67. | Nayadampoyil | 12 | |
| 68. | Vallamthode | 22 | |
| 69. | Vendakkumpoyil | 16 | |
| 70. | Konamunda | 3 | |
| 71. | Nalucent colony | 16 | |
| 72. | Vennekode naikkan colony | 16 | |
| 73. | Poolapotty | | |
| 74. | Plakkanchola | | |
| 75. | Kandilampara | | |
| 76. | Thottapalli | | |
| 77. | Suprecolony | | |
| 78. | Athikadu | | |
| 79. | Panapoyil | | |
| 80. | Kottupura aranadan colony – **Karulayi** | 20 | |
| 81. | Vallikettu aranadan colony | 10 | |
| 82. | Valiyabhoomikuth | 20 | |
| 83. | Cheriyabhumikuth | 6 | |
| 84. | Nedumkayam | 62 | |
| 85. | Pulimunda | 5 | |
| 86. | Mundakadavu | 23 | |
| 87. | Myladipotti | 29 | |
| 88. | Chodalpotti | 28 | |
| 89. | Valiyapulli | 15 | |
| 90. | Cheriyapulli | 13 | |
| 91. | Mylabara | 23 | |
| 92. | Koyalamunda | 2 | |
| 93. | Palakunnu | 4 | |
| 94. | Vellaramkunnu – **Edakkara** | 22 | 18 |
| 95. | Illikkadu | 15 | 11 |
| 96. | Karakkodemukkam | 23 | 8 |
| 97. | Kodalipoyil | 7 | 6 |
| 98. | Mathipotti | 8 | |
| 99. | Chalicolony | 14 | 12 |
| 100. | Manakkad | 14 | 8 |
| 101. | Muppanicolony | 23 | |
| 102. | Theyathumpadam | 14 | 12 |
| 103. | Theyathukottaparatha | 6 | |
| 104. | Aranadapadum | | |
| 105. | Unnichanthum | 22 | 16 |
| 106. | Pathiripadum | | |
| 107. | Malachi | | |

| | | | |
|---|---|---|---|
| 108. | Chembankallu | | |
| 109. | Uthirolum | | |
| 110. | Ambalathodi - **Vazhikadavu** | 17 | |
| 111. | Thekkumkutti | 8 | |
| 112. | Punchakolli | 51 | |
| 113. | Alakkalkattunaikkan colony | 21 | |
| 114. | Paradu aranadan colony | 2 | |
| 115. | Pathiripadam | 3 | |
| 116. | Vendakkumpotti | 8 | |
| 117. | Paralunda | 6 | |
| 118. | Odapotty | 11 | |
| 119. | Thannikadavu | | |
| 120. | Theekady colony – **Moothedum** | 24 | 16 |
| 121. | Ceerapadum | 8 | 8 |
| 122. | Thazhekarode | 8 | 6 |
| 123. | Varakode | 7 | 7 |
| 124. | Palangara | 7 | 6 |
| 125. | Nellikuth | 19 | |
| 126. | Poolakkapara | 13 | |
| 127. | Moochiparatha | 12 | |
| 128. | Puthuvay | 17 | |
| 129. | Vattapadam | 9 | |
| 130. | Vadakkekaikuruma colony | 6 | 6 |
| 131. | Erayanthani | 5 | |
| 132. | Panabatta paniya colony | 13 | |
| 133. | Melekarode paniya colony | 9 | 5 |
| 134. | Uchakulam | 23 | 18 |
| 135. | Kattadi | | |
| 136. | Vallipoola – **Chokkadu** | 5 | |
| 137. | Chenapadi | 11 | |
| 138. | Nelliyampadum | 14 | 13 |
| 139. | Chokadu girijan | 66 | 55 |
| 140. | Adakkakundu | | |
| 141. | Pattakarimbu – **Amarabalam** | 39 | 28 |
| 142. | Vahimoochikkal | 11 | 10 |
| 143. | Puncha | 4 | |
| 144. | Nadukkunnu | 2 | |
| 145. | Cholode | 10 | 9 |
| 146. | Chulliyodu | 20 | 18 |
| 147. | Veeralimunda | 3 | 3 |
| 148. | Ayyappakulam | 21 | 19 |
| 149. | Kombamkallu | 16 | 15 |
| 150. | Kanakkanchola vadakku | 6 | 5 |

| | | | |
|---|---|---|---|
| 151. | Paramba paniya colony | 14 | |
| 152. | Pariyangad | | |
| 153. | Pattikkallu | | |
| 154. | Chettipadum | | |
| 155. | Malamkundu – **Pothukal** | 11 | |
| 156. | Melethudimuti | 7 | |
| 157. | Appamkappu | 68 | |
| 158. | Neerpuzha | 7 | |
| 159. | Thandamkallu | 24 | 16 |
| 160. | Bhoodhanum | 46 | |
| 161. | Velumbiyapadum | 19 | |
| 162. | Koonipala | 11 | |
| 163. | Ambootampotti | 8 | |
| 164. | Chembra | 28 | |
| 165. | Kumbalapara | 15 | |
| 166. | Vaniampuzha | 36 | |
| 167. | Iruttukuthi | 20 | |
| 168. | Anakkallu | 11 | 10 |
| 169. | Chalikkal | 28 | 16 |
| 170. | Etappara | 16 | |
| 171. | Naranlapozhil | 42 | |
| 172. | Thudimutti | 24 | |
| 173. | Veetikunnu paniya colony – **Mambad** | 42 | |
| 174. | Kalluvari muduvan colony | 27 | |
| 175. | Madattil muduvan colony | 39 | |
| 176. | Pullipadam Ambedkar colony | 21 | |
| 177. | Palakkapozhil muduvan colony | 8 | |
| 178. | Thanikuzhi muduvan colony | 13 | |
| 179. | Palakkapoyil | 6 | |
| 180. | Palaparambu paniya colony | 9 | |
| 181. | Edakkode paniya colony | 4 | |
| 182. | Amarappalum | 5 | |
| 183. | Ananthal paniya colony | 7 | |
| 184. | Vadapuram | 18 | |
| 185. | Odaikkal | 6 | |
| 186. | Companykunnu | 13 | |
| 187. | Vettikunnu | 12 | |
| 188. | Vettikunnu muduvan colony | 10 | |
| 189. | Alakkal | | |
| 190. | Kodalipoyil | | |
| 191. | Njettikulam | | |
| 192. | Punchakolli | | |

| | | | |
|---|---|---|---|
| 193. | Chennapotti | | |
| 194. | Mathipotti | | |
| 195. | Tharippapotti | | |
| 196. | Cholara - **Edavanna** | 40 | |
| 197. | Vemboom kuzhi | 13 | |
| 198. | Kalliankal | 4 | |
| 199. | Odandappara | 9 | |
| 200. | Alankadai muduvan colony | 3 | |
| 201. | Chekkunnu – **Oorngattiri** | 7 | |
| 202. | Myladi | 15 | |
| 203. | Inthumpali | 9 | |
| 204. | Koorankallu | 2 | |
| 205. | Alappara | 6 | |
| 206. | Pannimmala | 20 | |
| 207. | Kaliakkal | 5 | |
| 208. | Nelliyayii | 49 | |
| 209. | Kodupuzha | 24 | |
| 210. | Kuriri | 25 | |
| 211. | Odakkayam | 15 | |
| 212. | Chenkannipali | 12 | |
| 213. | Pottadi | 8 | |
| 214. | Karimban thodi – **Vandore** | 9 | |
| 215. | Pattani tharisu – **Kalikavu** | 5 | |
| 216. | Adaikku kundu | 4 | |
| 217. | Puttala – **Karuvararkundu** | 14 | |
| 218. | Nellikalodi | 16 | |
| 219. | Cheriyil | 10 | |
| | **Total** | 2902 | |

| Tribe | Total number of families* | Number of families surveyed | Percentage of survey |
|---|---|---|---|
| Irular | 6414 | 325 | 5.06 |
| Malassar | 787 | 360 | 45.74 |
| Mudugar | 1233 | 409 | 33.17 |
| Kattunaikkar | 284 | 83 | 29.22 |
| Paniyar | 121 | 71 | 58.67 |
| Kadar | 72 | 48 | 53.84 |
| Kurumba | 391 | 62 | 15.85 |
| Eravalan | 1496 | 240 | 16.04 |
| Malayarayan | 124 | 69 | 55.64 |

* Directotate of Scheduled Tribes Development, Thiruvnanthapuram (2002-2003) and Tribal extension office, Palakkad

| Tribe | Total number of families* | Number of families surveyed | Percentage of survey |
|---|---|---|---|
| Arunadan | 75 | 12 | 16.00 |
| Malamuthan | 391 | 40 | 10.23 |
| Kurumar | 119 | 30 | 25.21 |
| kattunaikkar | 205 | 46 | 22.43 |
| Paniyar | 2178 | 306 | 14.04 |
| Cholanaikkan | 89 | 21 | 23.59 |

* Directotate of Scheduled Tribes Development, Thiruvnanthapuram (2002-2003) and Tribal extension office, Malappuram

**List 2.**

## Tribal colonies of Palakkad

| Sl. No. | PALAKKAD TRIBAL COLONY NAMES | NO OF COLONY | COLONY SURVEYED |
|---|---|---|---|
| 1. | Uppumpadum **Ayiloor** | 39 | |
| 2. | Veezhali | 21 | |
| 3. | Olippara | 8 | |
| 4. | Kodikarup | 11 | |
| 5. | Nadupathy parakkal | 23 | 22 |
| 6. | Koppan kulambu | 18 | |
| 7. | Kalchady | 18 | 15 |
| 8. | Ghattasi **Nemmara** | 15 | |
| 9. | Thiruthampadum | 19 | |
| 10. | Nellipadm | 18 | |
| 11. | Vakode **Karumba** | 21 | 18 |
| 12. | Mudikode | 13 | |
| 13. | Padiyappan tharissu | 8 | |
| 14. | Edamurissi | 5 | |
| 15. | Mookedayar | 6 | |
| 16. | Puthukadu | 5 | |
| 17. | Senkaram | 5 | |
| 18. | Kodilampotta **Puthupariyarum** | 8 | 6 |
| 19. | Mullakakara | 27 | 26 |
| 20. | Puliyampuli | 8 | 6 |
| 21. | Cheekuzhi | 6 | 6 |
| 22. | Cherimkadu **Akathethara** | 5 | |
| 23. | Parapotta | 16 | 16 |
| 24. | Thattikakallu **Vandazhi** | 41 | |
| 25. | Vadyarchalla **Puthussery** | 43 | 32 |
| 26. | Mangalathuchalla | 31 | 25 |
| 27. | Chellamkadukavu | 31 | 24 |
| 28. | Parapetty | 18 | 16 |
| 29. | Chavadipara | 12 | 10 |

| | | | |
|---|---|---|---|
| 30. | Nadupathi | 105 | 55 |
| 31. | Chandrapuram | 5 | 3 |
| 32. | Lakhsmveedu colony | 14 | 8 |
| 33. | Walayardam road | 11 | 6 |
| 34. | Nalucent | 10 | 7 |
| 35. | Parakalam | 11 | 11 |
| 36. | Subayya gowder thottum | 9 | 7 |
| 37. | Chandraswami gowder | 8 | 6 |
| 38. | Chandrapuram machan para | 5 | 4 |
| 39. | Pampanthodu **Kanjirampuzha** | 62 | |
| 40. | Vettilachola | 62 | 32 |
| 41. | Pangode | 14 | 12 |
| 42. | Gariman chola | 6 | |
| 43. | Anayaranam colony | 15 | |
| 44. | Ambedkkar colony | 35 | 14 |
| 45. | Karivay | 8 | |
| 46. | Easwaramannu | 5 | 4 |
| 47. | Chelakkara | 6 | |
| 48. | Karimankunnu **Manarkkadu** | 34 | |
| 49. | Yagabhoomi | 26 | |
| 50. | Irularkunnu | 10 | |
| 51. | Kompankundu | 11 | |
| 52. | Hanumanmoola | 9 | 9 |
| 53. | Moochikundu | 6 | |
| 54. | Santhethalum | 5 | |
| 55. | Vechiladicolony **Thachampara** | 22 | |
| 56. | Vakodan | 14 | 13 |
| 57. | Anakkalu | 14 | 14 |
| 58. | Sanjay nagar **Eruthempathy** | 36 | 24 |
| 59. | V.P Singh Nagar | 21 | 16 |
| 60. | Gandhi nagar | 6 | 14 |
| 61. | Poovappara **Muthalamada** | 40 | |
| 62. | Kuriyar kutty | 76 | 65 |
| 63. | Ancham colony | 18 | 16 |
| 64. | Earthdam colony | 42 | 38 |

| | | | |
|---|---|---|---|
| 65. | Kadavu colony | 45 | |
| 66. | Chatham para **Kollengode** | 40 | |
| 67. | Mathoor | 16 | |
| 68. | Thottum colony | 15 | |
| 69. | Parathodu | 13 | |
| 70. | Puthenpadum | 24 | |
| 71. | Varuthipara | 6 | |
| 72. | Vendakkapara | 5 | |
| 73. | Lakhshmanachalla | 5 | |
| 74. | Karithu **Kozhinjampara** | 8 | |
| 75. | Neelamkachi | 12 | |
| 76. | Neethadu | 31 | |
| 77. | Challa | 15 | |
| 78. | KK challa | 5 | |
| 79. | Thattanchalla | 20 | |
| 80. | Arammile | 6 | |
| 81. | Nedumpara | 31 | |
| 82. | Srambi | 90 | 58 |
| 83. | Kaadipara | 54 | |
| 84. | Odanchalla **Muthalamada** | 22 | |
| 85. | Navidumchalla | 8 | |
| 86. | Kochimadu **Pattanachery** | 41 | |
| 87. | Rajive nagar | 14 | |
| 88. | Thodicchipathi | 18 | |
| 89. | Nellimedu | 9 | |
| 90. | Chemmanampathi **Muthalamada** | 31 | |
| 91. | Chemmanampathi South | 86 | |
| 92. | Mattathcolony | 33 | |
| 93. | Manakadymedu | 26 | |
| 94. | Divippara | 11 | |
| 95. | Choonampathi | 20 | |
| 96. | Muchamkundu | 16 | |
| 97. | Mullumpara | 20 | |
| 98. | Mannadiyar chappakkad | 11 | |
| 99. | Masadiyar chappkkad | 25 | |

| | | | |
|---|---|---|---|
| 100. | Lakshamveedu chappakkad | 42 | |
| 101. | Mondipathy | 31 | 15 |
| 102. | Varkkad | 7 | |
| 103. | Nariparichalla | 46 | |
| 104. | Karippalichalla | 11 | |
| 105. | Minootumpara | 21 | |
| 106. | Meenkaracolony | 5 | |
| 107. | Edappapara | 18 | |
| 108. | Ammucolony | 13 | |
| 109. | Kattupathy | 18 | |
| 110. | Kundalakulampu | 38 | |
| 111. | Mechira | 16 | |
| 112. | Chudukattuvara | 8 | |
| 113. | Kulirampara | 31 | |
| 114. | Valiyapallapathi | 27 | |
| 115. | Pattanchalla | 10 | |
| 116. | Vadampathi thekku vadakku | 20 | |
| 117. | Theekara | 5 | |
| 118. | Govindapuram ambedkkar | 70 | |
| 119. | Sungham | 82 | 36 |
| 120. | Kachithode | 20 | 18 |
| 121. | 30ekkar | 68 | 45 |
| 122. | Oravampadi | 27 | 16 |
| 123. | Thekady | 23 | 18 |
| 124. | Sarkarpathi **Perumatti** | 87 | |
| 125. | Kunschumemnompathy | 31 | |
| 126. | Silvampathi | 30 | |
| 127. | Srambii | 28 | |
| 128. | Mullanthodu | 13 | |
| 129. | Kadamampara | 5 | |
| 130. | Plassimada | 66 | |
| 131. | Vijayanagar | 35 | |
| 132. | Velur | 10 | |
| 133. | Kampalathara | 11 | |
| 134. | Marymedu | 13 | |

| | | | |
|---|---|---|---|
| 135. | Nellimedu | 36 | |
| 136. | Charalipathi | 20 | |
| 137. | Karadikur | 22 | |
| 138. | Muthuswamiputhur | 26 | |
| 139. | Poovarathimarathikkadu | 10 | |
| 140. | Ramanpandai | 43 | |
| 141. | Mammarathumkadu | 23 | |
| 142. | Mallanpathi **Vadakarpathi** | 32 | |
| 143. | Kamarajnagar | 23 | |
| 144. | Kinarpallam | 25 | |
| 145. | Ozhalapathy | 33 | |
| 146. | Munsichalla | 19 | |
| 147. | Babajinagar | 15 | |
| 148. | Kozhipara | 11 | |
| 149. | Velanthavalam | 12 | |
| 150. | Chundakkapukkanthodu | 7 | |
| 151. | Adayampathy | 21 | |
| 152. | Kalliyampara | 9 | |
| 153. | OVH kaikatty puliyampara **Nelliyampathi** | 11 | |
| 154. | Cherunelly colony | 7 | 7 |
| 155. | Puthumundu Estate | 19 | |
| 156. | Rajakode | 9 | |
| 157. | Kairali | 8 | |
| 158. | Mallanchalla | 33 | 5 |
| 159. | Kulappurachalla | 5 | 4 |
| 160. | Kasimari | 19 | |
| 161. | Karaputhukadu | 24 | |
| 162. | Rajamanikyam Kowderkadu | 11 | |
| 163. | Palakkad | 54 | |
| 164. | Kootukaranpathi | 35 | |
| 165. | Valavupalum | 10 | |
| 166. | Mallanpathi | 13 | |
| 167. | Ramachampathi | 16 | |
| 168. | Chandramala estate | 45 | |

| | | | |
|---|---|---|---|
| 169. | Manalar | 19 | |
| 170. | Thoosipara | 9 | |
| 171. | Oriyadar | 13 | |
| 172. | Alexandriya | 9 | |
| 173. | KTDC Pothumala | 13 | |
| 174. | Thoothpara | 5 | |
| 175. | Kottakunnu | 23 | |
| 176. | Kodakadu | 12 | |
| 177. | Churiyodu | 12 | |
| 178. | Puliledi | 16 | |
| 179. | Karadichodu | 23 | |
| 180. | Ampalappara | 27 | |
| 181. | Pozhakkupadum | 34 | |
| 182. | Mekkalapadum | 17 | |
| 183. | Moopanchola **Malampuzha** | 14 | 12 |
| 184. | Meledam | 6 | |
| 185. | Mettupathi | 43 | 18 |
| 186. | Karingaliladam | 24 | |
| 187. | Chempana | 22 | |
| 188. | Adappu | 5 | 5 |
| 189. | Elakuthanpara | 30 | 16 |
| 190. | Kadalikadu | 19 | 16 |
| 191. | Pookundu | 16 | 9 |
| 192. | Kollamkunu | 12 | 10 |
| 193. | Alival | 25 | 13 |
| 194. | Vellezhuthanpotta | 12 | 11 |
| 195. | Kuruthikadavu | 16 | 14 |
| 196. | Kachithodu | 17 | 13 |
| 197. | Parakkalam | 11 | 11 |
| 198. | Mathampara | 15 | 13 |
| 199. | Ayyapanpotta | 26 | 22 |
| 200. | Muthiramkunnu | 7 | 7 |
| 201. | Karapadum **Kumaraputhoor** | 15 | 13 |
| 202. | Ambalapara **Kottepadum** | 32 | |
| 203. | Karadiyodue | 24 | |

| | | | |
|---|---|---|---|
| 204. | Poolikaladi | 17 | |
| 205. | Kottakunnu | 23 | |
| 206. | Thodukkad | 14 | |
| 207. | Chooriyodu | 14 | |
| 208. | Pothuvapadum | 20 | |
| 209. | Mekkalapara | 7 | |
| 210. | Amakunnu | 13 | |
| 211. | Uppukulam **Alakanallur** | 13 | |
| 212. | Moochikallu | 7 | |
| 213. | Valiparambu **Mundoor** | 1 | |
| 214. | Athipotta | 1 | |
| | **Total** | **4557** | |

a. Tribal group - Kadar

b. Hut of tribal people

**Plate 1. Tribals & hut**

## 5.1 Ethnozoological analysis

**INSECTS**

**Order**: Hymenoptera

**Family**: Apidae

**Species**: *Apis cerana indica* (Fabricius, 1793)

**Common name**: Indian bee

**Notes:** This species is domesticated. Head is darker, flattened and triangular in shape. It is protected by chitinous plates called sclerites. Abdomen is formed of nine segments. They also have prominent abdominal stripes. They form smaller colonies.

**Usage:** Honey is effective for cough, stomach pain and urinary disorder. It is also fed to women after delivery.

**Order**: Hymenoptera

**Family**: Apidae

**Species**: *Apis dorsata* (Fabricius, 1793)

**Common name**: Rock bee

**Notes:** In the southern states of India including Kerala, extraction of honey from *Apis dorsata* colonies has been significant and about 60 percent of honey extracted in Kerala come from this species. The size of a single open-air comb, depending upon the season and stage of development of a colony measures 1.5 to 2m breadth wise and 0.6 to 1.2 m lengthwise. The comb is suspended from rocks, ceilings of neglected and uninhabited houses and branches of tall trees. Honey yield per colony varies from 5-20 kg. Their sting is probably the most painful of any honeybee species.

**Usage:** Honey is used in diarrhoea and vomiting.

**Order**: Hymenoptera

**Family**: Apidae

**Species**: *Apis florea* (Fabricius, 1787)

**Common name**: Little honeybee

**Notes:** This is an inoffensive little insect, reluctant to use its sting. A single colony consists of a single comb, the size of the palm of a man's hand. This dwarf honeybee is the smallest species of honeybee. A nest of *A. florea* consists of a single comb, whose upper part expands to form a crest that surrounds the branch or other object from which the comb is suspended.

**Usage:** Honey is used in snakebite, general head ache, cures eye diseases and imparts fair complexion also in the treatment of mental diseases.

**Order**: Lepidoptera

**Family**: Bombicidae

**Species**: *Bombyx mori* (Linnaeus, 1758)

**Common name**: Silk worm

**Notes**: Commercially most important species and is the major producer of silk. The silk worm is naked and has a short anal horn. Adults in this family have heavy, rounded, furry bodies and cannot feed. The forewing has a hooked tip, characteristic in this family, however it is flightless. Wings and body are usually white, but may vary to shades of light brown. The larva is an elongated caterpillar commonly called a silkworm. Larvae are monophagous and feed only on mulberry plants.

**Usage:** Its ash is used in digestive problems and in eye diseases.

**Order**: Hymenoptera

**Family**: Formicidae

**Species**: *Oecophylla smaragdina* (Fabricius, 1775)

**Common name**: Red ant

**Notes**: Large reddish ants with a fierce bite. Is a species of arboreal ant always nesting in trees or shrubs. They make nests in trees made of leaves stitched together using the silk produced by their larvae. Foraging takes place both on vegetation and on the ground, and they are predacious.

**Usage:** A paste made of ants is eaten as a remedy for myopia.

**Order**: Orthoptera

**Family**: Acrididae

**Species**: *Patanga succincta* (Johansson, 1763)

**Common name**: Grasshopper

**Notes:** Live among grass and herbage on the ground. They are variously colored and are protected as long as they keep still by blending with their surroundings. They are active by day and if disturbed jump suddenly and powerfully, using their greatly enlarged hindlegs. Can also crawl slowly by means of the other two pairs of legs. It is short-horned. They are mainly ground living insects.

**Usage:** Fried and eaten as a delicious food.

**Order**: Dictyoptera

**Family**: Blattidae

**Species**: *Periplanata americana* (Linnaeus, 1758)

**Common name**: Cockroach

**Notes**: It is the chief house-living cockroach. They come out at night. The adult cockroach is reddish brown in appearance with a pale-brown or yellow band around the edge of the pronotum. The males are longer than the females because their wings extend 4 to 8 mm beyond the tip of the abdomen. Males and females have a pair of slender, jointed cerci at the tip of the abdomen. The male cockroaches have cerci with 18 to 19 segments while the female has 13 to 14 segments. The male American cockroaches have a pair of styles between the cerci while the females do not.

**Usage:** Ash is used with honey for dysponea, urinary obstruction and uterine colic infection.

**Order**: Diptera

**Family**: Muscidae

**Species**: *Musca domestica* (Linnaeus)

**Common name**: Housefly

**Notes:** Stoutly built and in both sexes abdomen is yellowish or buff. The adults are 5-8 mm long. Their thorax is grey, with four dark longitudinal lines on the back. The underside of the abdomen is yellow. The whole body is covered with hair. They have red compound eyes. The females are slightly larger than the males and have a much larger space between the eyes. have only one pair of wings; the hind pair is reduced to

small halteres that aid in flight stability. Characteristically, the medial vein shows a sharp upward bend.

**Usage:** Whole paste is applied to treat furuncles.

**Order**: Hymnoptera

**Family**: Apidae

**Species**: *Trigona*

**Common name**: Stingless bee

**Notes:** They make large colonies in hollow logs and similar places and they are domesticated for their honey. The bees are small in size and do not sting. They are black in colour with hairy, extended hind legs for carrying nectar and pollens.

**Usage:** Used to treat glaucoma.

**Order**: Hymnoptera

**Family**: Apidae

**Species**: *Melipona*

**Common name**: Stingless bee

**Notes:** They make large colonies in hollow logs and similar places and they are domesticated for their honey. The bees are small in size and do not sting. They are black in colour with hairy, extended hind legs for carrying nectar and pollens. A few grams of honey alone are available from a single comb.

**Usage:** Used to treat glaucoma.

## ANNELIDS

**Order**: Rhyncobdellida

**Family**: Hirudidae

**Species**: *Hirundo medicinalis* (Lamarck, 1818)

**Common name**: Leech

**Notes:** It is a viscous animal, greenish with longitudinal red stripes. It has a pattern of irregular markings over its body. It is a jawed leech, and has strong teeth, which make Y-shaped cut in the skin of its prey, through which it sucks blood.

**Usage:** Tribes boil leeches in sesame oil to produce a sexual stimulant for male sex organ. Dried and pulverized leeches are given with honey in pharyngitis; with oil in piles.

**Order**: Prospora

**Family**: Lumbricidae

**Species**: *Pheretima posthuma* (Kinberg)

**Common name:** Earthworm

**Notes:** Body is divided into segments. Meronephric. Has tufted pharyngeal nephridia on segments 4-6. There are 200-250 small, closed integumentary exonephridia on segments 7-15 and open holonephric enteronephridia.

**Usage:** Dried worms are beneficial in healing wounds, chronic boils, piles, sore, chronic cough, and diphtheria and in jaundice. Oil from worms is used in hemiplegia, paralysis and muscular pains.

## MOLLUSC

**Order**: Gastropoda

**Family**: Ampullariidae

**Species**: *Pila globosa* (Swainson, 1821) (Plate 2 a.)

**Common name**: Apple snail

**Notes:** The shell is globose with an oval opening. *Pila globosa* has a large and deep umbilicus. The colour varies from olive green to grey green with a tinge of red. The interior of the shell is dull reddish with very faint spiral bands visible, white at the columella.

**Usage:** Flesh is edible, shell is used to scrapping.

a. Pila globosa

**Plate 2. Mollusc**

**ARTHROPOD**

**Order**: Decapoda

**Family**: Paguridae

**Species**: *Cancer pagurus* (Linnaeus, 1758)

**Common name**: Crab

**Notes:** During summer small individuals, seldom large enough for eating may be found beneath rocks and in crevices around the low tide mark. As the weather becomes colder there is a migration to deep water, where spawning takes place during winter. The eggs hatch the following summer in shallow coastal waters.

**Usage:** Flesh boiled and taken in, to relieve cough. Fat used for burns and flesh and eggs are used to increase lactation. Fat is placed in the decaying teeth. Fried crab is used to treat whooping cough.

## ARACHNIDS

**Order**: Orthognatha

**Family**: Theraphosidae

**Species**: *Theraphosa* (Thorell, 1870)

**Common name**: Bird eating spider

**Notes:** This is the largest among the living spiders. Body and legs are hairy and the hairs have an irritant effect on the human skin. This is a deep burrowing species that flicks clouds of urticating hairs at any perceived threat.

**Usage:** Hairs used in magic rituals.

**Order**: Labidognatha

**Family**: Scorpionidae

**Species**: *Palamnaeus swammerdami*

**Common name**: Scorpion

**Notes:** Notorious for their stings and the venom is fatal to man. Body is segmented and bears a pair of chelicerae or pincer like claws. Thorax has four segments with a pair of walking legs on the under surface and the abdomen has six segments tapering to a

single sharp sting at the end with a small opening supplied by two relatively large venom glands.

**Usage:** The whole body is boiled in gingiley oil and used for massaging to treat rheumatic pains.

**PISCES**

**Order**: Osteoglossiformes

**Family**: Notopteridae

**Species**: *Notopterus notopterus* (Pallas)

**Common name**: Bronze featherback fish (Plate 3b.)

**Notes:** Body oblong and strongly compressed. Head compressed. Pre orbital is serrated. Mouth moderate, maxilla extends upto middle of the orbit. Dorsal fin inserted nearer to the caudal fin base than the tip of the snout. Ventral fin is rudimentary. Anal fin is confluent with the caudal fin. Scales minute, larger in the opercular region than the scales in the body. Color is silvery white with numerous fine grey spots in the body and head.

**Usage:** Fish is taken as food.

**Order**: Cypriniformis

**Family**: Cyprinidae

**Species**: *Cyprinus carpio communis* (Linnaeus)

**Common name**: Katla

**Notes:** Body robust and laterally compressed. Head is small. Snout is bluntly rounded. Eyes are large. Inter orbital region is convex. Barbels two pairs, maxillaries and rostral and the former are longer than latter. Dorsal fin inserted distinctly nearer to the base of the caudal peduncle than the tip of the snout. Its large unbranched ray is osseous, strong and finely serrated. Anal fin is with a strong and osseous serrated spine. Caudal fin is short and stout. Scales large and cycloid. Lateral line is complete with 32 scales. Color in golden yellowish without any markings.

**Usage**: Fish is edible.

**Order**: Cypriniformis

**Family**: Cyprinidae

**Species**: *Hypselobarbus kolus* (Sykes)

**Common name**: Kolus

**Notes:** Body is fairly deep. Eyes are large and not visible from ventral side. Mouth sub-terminal. One or two pairs of barbels well developed. Dorsal fins inserted anterior to the pelvic fins. Its last unbranched ray is osseous, weak or strong. Scales are medium to large size and the lateral line complete.

**Usage**: Fish is edible.

**Order**: Cypriniformis

**Family**: Cyprinidae

**Species**: *Hypselobarbus dubius* (Day)

**Common name**: Nilgiris barb

**Notes:** Inhabits in deeper portion of large streams and rivers below the ghats. Migrates upstreams during floods and spawns in the upper reaches of streams. Omnivorous; feeds on allochthonous plant materials, seeds, terrestrial insects, *Chironomous* larvae and small benthic molluscs.

**Usage:** Fish is taken as food.

**Order**: Cypriniformis

**Family**: Cyprinidae

**Species**: *Neolissochilus wynaadensis* (Day)

**Common name**: Pachilavetti vella

**Notes:** Body elongate and slightly compressed. Head is broad. Mouth smoothly rounded and lips are fleshy. Lower labial groove is interrupted in the middle. Snout is conical. Interorbital region is nearly convex. Barbels two pairs, maxillaries and rostral; former is longer reaching upto the orbit. Snout is with or without pores. Dorsal fin inserted distinctly nearer to the tip of the snout than the base of the caudal peduncle. Its last unbranched ray is slightly osseous. Ventral fin inserted behind the dorsal. Caudal peduncle is long and narrow. Scales are long and medium sized. Color is leaden along the back. Yellowish tinge on the flanks. A dark lateral band is running along the lateral line from eye to the middle of the caudal fin base. Fins are grayish.

**Usage**: Fish is edible.

**Order**: Cypriniformis

**Family**: Cyprinidae

**Species**: *Neolissochilus anamalaiensis* sp. nov.

**Common name**: Pachilavetti karuppu

**Usage:** Fish is taken as food

**Order**: Cypriniformis

**Family**: Cyprinidae

**Subfamily:** Cyprininae

**Species**: *Cirrhinus mirgala* (Hamilton-Buchanan)

**Common name**: Mirgala

**Notes:** Body streamlined, its depth about equal to length of head. Snout blunt, often with pores. Mouth broad; upperlip entire, lower lip most indistinct. Barbels, a single short pair of rostrals only. Pharyngeal teeth are in three rows. Dorsal fin present as high as body. Pectoral fins shorter than head. Gill rakers 40 to 49 on first arch. Caudal fin deeply forked. Lateral line with 40 - 45 scales. Dark grey along back often with a coppery tinge, flanks silvery with a yellowish tinge and belly silvery white. Eyes are golden color.

**Usage**: Fish is edible.

**Order**: Cypriniformis

**Family**: Cyprinidae

**Species**: *Labeo calbasu* (Hamilton-Buchanan)

**Common name**: Major carp (Plate 3a.)

**Notes:** Scales of moderate or small size. Dorsal fin without osseous ray with more than nine branched rays, commencing somewhat in advance of the ventrals. Snout obtusely rounded, the skin of maxillary region being more or less thickened forming a projection beyond the mouth. Mouth transverse, inferior, with the lips thickened, each or one of them being provided with an inner transverse fold, which is covered with a decidous horny substance forming a sharp edge which however does not rest upon the bone as base, but is soft and movable.

**Usage**: Fish is edible.

**Order**: Cypriniformis

**Family**: Cyprinidae

**Species**: *Labeo rohita* (Hamilton-Buchanan)

**Common name**: Rohu (Plate 3c.)

**Notes:** Body deep, stout, with broad snout. Mouth wide with skin covering lower lip. Length approximately 198cm, snout blunt, gill rackers nine in number. Lateral line system is complete. Dorsal fins are with four unbranched and eight branched rays. Pectorals below the lateral line and body bluish along the back, becoming silvery on the flanks and beneath. Eyes are reddish.

**Usage**: Fish is edible.

a. *Labeo calbasu*

b. *Notopterus notopterus*

c. Labeo rohita

**Plate 3. Pisces**

## REPTILES

**Order**: Crocodilia

**Family**: Crocodylidae

**Species**: *Crocodilus palustris*

**Common name**: Marsh crocodile

**Notes**: Have a short snout. The teeth in the upper and lower jaws are in line, the fourth lower tooth on each side is perceptibly larger than the rest and fits into a notch in the upper jaw and is visible when the mouth is closed. Colour generally light tan in juveniles, with black cross banding on body and tail. Adults are generally grey to brown, with little banding remaining. This is a medium to large species (4 to 5 m).

**Usage:** Eggs of crocodile used to treat asthma; skin is greatly priced by trade.

**Order**: Squamata

**Family**: Varanidae

**Species**: *Varanus bengalensis*

**Common name**: Monitor lizard (Plate 4b.)

**Notes:** Over two feet long and compressed laterally, the entire animal is covered with fine granular scales; neck is longer than a long flattened head. It has a long forked snake-like tongue, which darts out and is a sensory organ. Teeth are pleurodont. It lives in burrows and on trees. It is carnivorous. It lays eggs in a nest or in the ground.

**Usage:** Fat massaged to relieve arthritis, body pain and rheumatism. Flesh is cooked and eaten to treat piles.

**Order**: Squamata

**Family**: Oligodontidae

**Species**: *Ptyas mucosus*

**Common name**: Rat snake

**Notes:** Majority of adults varies in size from 1.65-2m. Males usually longer than females. Head rather elongate, eyes large and lustrous. Nostrils large, occupying the whole depth of the suture between nasals. Neck distinctly constricted. Body robust, compressed, tapering towards both ends. Tail cylindrical about one-fourth in total length. The body is dorsally olivaceous brown, sometimes as dark as sepia or light mustard yellow.

**Usage:** Fat massaged to relieve body pain and rheumatism. Skin is collected for trade.

**Order**: Squamata

**Family**: Elapidae

**Species**: *Naja naja*

**Common name**: Indian Cobra (Plate 4a.)

**Notes:** Medium sized snake with an average of six or seven feet. The dark body is encircled by a series of light rings. Has a characteristic hood behind the neck. Neck is

flattened horizontally by long movable ribs being swung out to stretch the loose skin of the neck. It has a distinctive spectacled pattern as the scales slide apart.

**Usage:** Most commonly traded as live species and as game animal being used by snake charmers for roadside shows.

**Order**: Squamata

**Family**: Pythonidae

**Species**: *Python reticulates*

**Common name**: Python

**Notes:** Large, massive, non-poisonous snake covered with small scales and shields on the head and with large plates below. This reaches upto a length of 33 feet. Tail is prehensile. It has a vertical pupil. Premaxilla also bears teeth. It constricts warm-blooded animals in its coils and kills them due to suffocation, and then it slowly swallows its prey. Have vestigial pelvic girdle, which articulates with a small femur bearing a claw; the claws are seen on either side of the cloaca. They are oviparous. Body is grayish brown with red and black spots and a mark like a spearhead between the eyes and ventral side is yellowish. Scales of upper lip have pits. It is nocturnal and very often waits on trees for its prey.

**Usage:** Fat is applied to relieve rheumatic pains and also to treat toothache.

a. *Naja naja*

b. *Varanus bengalensis*

**Plate 4. Reptiles**

**AMPHIBIANS**

**Order**: Anura

**Family**: Ranidae

**Species**: *Euphlyctis hexadactylus*

**Common name**: Indian green frog (Plate 5a.)

**Notes:** Medium to large sized frog that is commonly seen in freshwater ponds through out the plains. The eyes are placed towards the top of the head and the eardrum is large and distinct. The skin is smooth. The first finger is slightly longer than the second

finger. The toes are fully webbed. There is a small though distinct finger-like digging appendage on the inner aspect of the sole. The sexually mature males develop breeding pads on the first finger. Voal sacs are external and the region around the vocal sacs tends to turn yellow in breeding males.

**Usage:** Fat is used as aphrodisiac.

**Order**: Anura

**Family**: Ranidae

**Species**: *Euphlyctis cyanophlyctis*

**Common name**: Skipper frog

**Notes:** Medium-sized aquatic frog. Easily identified by its habit of floating in open water. The back is dark olive-brown (sometimes blackish or even with patches of green), normally bearing black blotches. The underside is white. The adults reach a maximum length of 6.9cm and females are normally larger than males. The skin on the back is generally smooth; the folds when present are most clearly visible when the skin is dry. The eyes are placed more towards top. Eardrum is clearly visible. Toes are fully webbed. The vocal sacs are external, bluish and are visible on either side of the throats as the males call.

**Usage:** Flesh is edible dish as ‘frog leg’.

**Order**: Anura

**Family**: Ranidae

**Species**: *Limnonectes limnocharis*

**Common name**: Paddyfield frog (Plate 5b.)

**Notes:** The adults reach a length of 2.0-6.4cm. The males are much smaller than the females. The skin on the back may bear some folds and warts. The snout is pointed. The eardrum is large and about 2/3 diameter of the eye. The tips of the fingers and toes do not bear discs and the toes are about ½ webbed. The first finger is longer than the second. The males have external vocal sacs that are visible when they call.

**Usage:** Flesh is edible dish as 'frog leg'.

**Order**: Anura

**Family**: Ranidae

**Species**: *Hoplobatrachus crassus*

**Common name**: Jerdon's bull frog

**Notes**: Medium to large sized frog. The adults reach a maximum length of 13.0cm. The skin on the back and sides bear numerous folds and warts. The eardrum is large and distinct. The toes are fully webbed. A large shovel-shaped digging appendage present on the inner aspect of the sole is a characteristic feature. The appendage is absent on the outer aspect of the sole. The vocal sacs in the males are external and turn black at the time of breeding.

**Usage:** Flesh is taken in to treat cracks on feet.

**Order**: Anura

**Family**: Ranidae

**Species**: *Hoplobatrachus tigerinus*

**Common name**: Indian bull frog

**Notes:** Largest frog in India. The overall coloration is yellowish, and some have traces of green on the sides. The adult may grow upto 16cm in length. They are every bulky with long and muscular limbs. The snout is distinctly long and pointed. The eardrum is large and distinct. The skin bears numerous folds. The toes are extensively webbed, is proportionately smaller. The vocal sacs are external and blue in color. The males are smaller and darker than the females; they also have large breeding pads on the first finger.

**Usage:** Skin applied on burns for rapid healing. Fat is used for massaging arthritis.

a. Limnonectes limnocharis

b. Euphlyctis hexadactylus

**Plate 5. Amphibians**

**AVES**

**Order**: Podicipediformes

**Family**: Podicipdedidae

**Species**: *Tachybaptus ruficollis* (Pallas, 1974)

**Common name**: Little grebe

**Notes:** Nearly 23 cm long. Squat and tail less. Bird is drab colored, plump with silky white underparts. Short pointed bill and no tail. In breeding plumage of head and neck become dark brown and chestnut, upper plumage slightly paler. Yellow swollen gape

then conspicuous. Sexes alike. Pairs or parties. Seen in village tanks, rain-filled ditches and ponds, etc.

**Usage**: Eggs massaged on body for 4-5 days, once in a day to relieve swelling of body.

**Order**: Ciconiformes

**Family**: Ardeidae

**Species**: *Egretta garzetta* (Linnaeus, 1766)

**Common name**: Little Egret

**Notes:** Size is as that of a village hen; longer neck and legs. A lanky snow-white marsh bird with black bill, parti-colored black and yellow feet. A drooping crest of two long, narrow plumes in the breeding season also dainty filamentous ornamental feathers in both the back and crest. Seen in marshes, flooded paddy fields, etc.

**Usage**: Flesh is edible.

**Order**: Ciconiformes

**Family**: Ardeidae

**Species**: *Casmerodius albus* (Linnaeus, 1758)

**Common name**: Large Egret (Plate 6c.)

**Notes:** Size reaches to 63 cm. Snowy white in color, legs black. Bill black and yellow or black. Seen in marshes, rivers etc. Have white breeding plumes. Bill is yellow, sharp and leg color is black.

**Usage**: Flesh is used as food

**Order**: Ciconiformes

**Family**: Ardeidae

**Species**: *Ardeola grayii* (Sykes, 1832)

**Common name**: Indian Pond Heron

**Notes:** This is more than 46 cm in length. Earthy brown in color when at rest, but with glistening white wings. Tail rump flashing prominently in flight. In breeding season acquires maroon hair-like plumes on back, and long white occpital crest. Sexes alike. Found in marshes, streams, paddyfields, ponds etc.

**Usage**: Flesh is edible; oil extracted, warmed and applied externally for 2-4 days, once daily to treat rheumatic complaints.

**Order**: Falconiformes

**Family**: Accipitridae

**Species**: *Buteo buteo* (Linnaeus, 1758)

**Common name**: Common Buzzard

**Notes:** Length ranges from 51-56cm. Has dark and light plumage phases like other buzzards. Easily confused with other buzzards due to great variability in plumages. Legs one-third or half feathered infront. Naked portion is scutellated. In overhead flight the broad black-tipped wings show large whitish patches.

**Usage**: Feather roasted, powdered and dissolved in honey and orally administrated for about 15 days for curing cough.

**Order**: Falconiformes

**Family**: Accipitridae

**Species**: *Ictinaetus malayensis* (Temminck, 1822)

**Common name**: Greater Spotted Eagle

**Notes:** This eagle ranges in size from 69-81cm. This is large black eagle with narrowly grey-barred tail, bright yellow cere and legs and wings reaching upto the tail at rest. In flight they widely displayed upturned primaries, and broad wings held in a flat V above line of back, a pale patch on dark underside of wings and white patch under eye diagnostic. Young have pale brown stippled paler on head and hind neck; upper tail-coverts fringed with white; throat and breast with fulvous-brown oval drops; belly and flanks dark-streaked.

**Usage**: Nail roasted, powdered and dissolved in mustard oil and used as eardrops for 4-5 days.

**Order**: Gruiformes

**Family**: Rallidae

**Species**: *Gallicrex cinerea* (Gmelin, 1789)

**Common name**: Water Cock

**Notes:** A rail-like swamp bird. The body of male is 43cm long and that of female is 36cm. In non-breeding plumage of both sexes are dark brown, scalloped with wavy darker bars below. Breeding male is black with red fleshy knob on crown and bright red legs and eyes. They are seen in marshes ponds, ricefields etc.

**Usage**: Flesh rubbed on muscles for 2-3 times to treat muscular pain.

**Order**: Gruiformes

**Family**: Rallidae

**Species**: *Porphyrio porphyrio* (Linnaeus, 1758)

**Common name**: Purple Moorhen

**Notes:** A handsome but clumsy purplish blue rail with long red legs and toes. The bald red forehead (frontal shield) continued back from the short heavy red bill, and the white patches under the stumpy tail (conspicuous when flicked up at each step) are leading clues. Sexes alike. Seen in swampy reed-beds.

**Usage**: Blood massaged on affected part for 2-4 days once a day to cure paralysis.

**Order**: Charadriiformes

**Family**: Scolopacidae

**Species**: *Tringa ochropus* (Linnaeus, 1758)

**Common name**: Green Sandpiper

**Notes:** The biggest and bulkiest in this group. They almost invariably look contrastingly dark above and light below, indeed almost black and white, with the dark head and breast coming to an abrupt end level with the bottom edge of the wings, isolating the white belly. The wings and mantle show only faint pale spots and there is a striking white line from the bill, round the eye and back again. It frequently bobs up and down

when standing. It often appears nervous and will fly off with a low zig-zagging flight when disturbed.

**Usage**: Flesh is used as food. Raw crushed flesh with onion and cumin powder that is a remedy for cough.

**Order**: Psittaciformes

**Family**: Psittacidae

**Species**: *Psittacula cyanocephala* (Linnaeus, 1766)

**Common name**: Plum headed Parakeet (Plate 6f.)

**Notes**: Have a small size, bluish red head and maroon shoulder patches. In female, head greyer with a bright yellow collar round neck, and no maroon shoulder-patches. White tips to the two long central tail feathers diagnostic in flight, as aloso the interrogative utterings on the wing. Hen with bluish-grey head and yellowish edging; dark red patch on wing-coverts absent; upper mandible pale yellowish, lower mandible grey. Immatures are with greenish head and often with grey tinge to chin; forehead orange-grey; upper and lower mandible yellowish; both sexes attain hen adult plumage at 15 months; young cock attains full adult cock plumage at 30 months. Length is 33 cm, wing length 126 - 146 mm, tail length 152 - 225 mm.

**Usage**: Used as pet animal in trade.

**Order**: Cuculiformes

**Family**: Cuculidae

**Species**: *Cuculus canorus* (Linnaeus, 1758)

**Common name**: Cuckoo

**Notes:** Have slender long tail. Dark ash/grey above, pale below on chin, foreneck and breast. Otherwise white below cross-barred with black. Tail blackish brown, spotted and tipped with white. Female has a rufous tinge on upper breast, throat and sides of neck. Females occassionaly in a hepatic phase with upper parts barred chestnut and blackish brown.

**Usage**: Flesh cooked with cumin powder and consumed for 10 days to treat cough and breathing trouble.

**Order**: Cuculiformes

**Family**: Cuculidae

**Species**: *Eudynamys scolopacea* (Linnaeus, 1758)

**Common name**: Asian koel (Plate 6e.)

**Notes:** There are two toes infront and two behind, out hind toe is reversible. Feet are not adatpted for grasping. Tail is long and beak moderate. They are parasitic, the female laying eggs in nest of other birds. Male is glistening black, with yellowish green bill and crimson eyes. Female brown profusely spotted and barred with white. Familiar shrieking crescendo call, *kuoo-kuoo-kuoo*. Singly or in pairs in grooves of trees, etc.

**Usage**: Fat massaged till disease cured rheumatic complaints.

**Order**: Columbiformes

**Family**: Columbidae

**Species**: *Columba livia* (Gmelin, 1789)

**Common name**: Blue rock pigeon (Plate 6d.)

**Notes:** Spindle-shaped fusiform body with about 33cm long body. Eyes and feet are pink and rest of the body slaty gray with glistening metallic green and purple sheen on upper breast and around the neck. The wing has two black bars and a band across end of tail. Vegetarians feeding on grains, pulses, seeds of fruits and grasses. Have long powerful wings well adapted for swift and strong flight. They make a bipedal gait. Lead monogamous life. Flocks and colonies, about cliffs and human inhabitations.

**Usage**: Blood orally administrated for 7 days once daily to treat breathing trouble, flesh and blood with hen's egg used to treat tuberculosis. Also used as pet animal.

**Order**: Columbiformes

**Family**: Columbidae

**Species**: *Chalcophaps indica* (Linnaeus)

**Common name**: Emerald dove

**Notes**: A brownish pink dove, with glistening bronze-green underparts (excluding tail) and conspicuous forehead and eyebrows. In flight chestnut underside of wings is diagnostic. Sexes alike. Singly or pairs, in forest. Emerald dove is a stocky medium-sized pigeon, typically 23-28cm in length. The back and wings are bright emerald green. The fight feathers and tail are blackish, and broad black and white bars shown on

the lower back in flight. The head and underparts are dark vinous pink, fading to greyish on the lower belly. The eyes are dark brown, the bill bright red and legs and feet rufous. The male has a white patch on the edge of the shoulders and a grey crown, which the female lacks. Females will tend to have a brownish complexion with a grey mark on the shoulder. The immature birds resemble females but have brown scallops on their body and wing plumage.

**Usage**: Used as pet species.

**Order**: Strigiformes

**Family**: Tytonidae

**Species**: *Tyto alba* (Scopoli, 1769)

**Common name**: Barn Owl

**Notes:** A typical owl, golden buff and grey above finely stippled with black and white; silky white below tinge with buff and normally spotted dark brown. Large round head with a conspicuous ruff of stiff feathers surrounding a comically pinched white monkey-like facial disc. Sexes alike. Singly or pairs, about deserted buildings and ruins.

**Usage**: Liver dried, powdered and dissolved in milk given to children for 2-4 days to treat rickets.

**Order**: Strigiformes

**Family**: Strigidae

**Species**: *Bubo nipalensis* (Hodgson, 1836)

**Common name**: Forest Eagle Owl

**Notes:** A large brown owl with two outwardly slanting erect black and white horns or ear tufts, fully feathered legs and brown eyes. Below fulvous white barred with blackish on throat and breast. Sexes alike.

**Usage**: Liver squashed, mixed with breast milk and given to children for 2-4 days once daily for rickets.

**Order**: Strigiformes

**Family**: Strigidae

**Species**: *Athene brama* (Temminck, 1821)

**Common name**: Spotted Owlet (Plate 6b.)

**Notes:** A squat, white-spotted grayish brown little owl, with a typical large round head and forwardly directed staring yellow eyes. Sexes alike. Pairs or family parties seen in villages, in ruins and grooves of ancient trees, etc.

**Usage**: Liver squashed, mixed with breast milk and given to children for 2-4 days once daily for rickets.

**Order**: Coraciformes

**Family**: Alcedinidae

**Species**: *Ceryle rudis* (Linnaeus, 1758)

**Common name**: Lesser Pied Kingfisher

**Notes:** A speckled and barred black-and-white kingfisher with the typical dagger-shaped bill. The beak is strong. Female similar to male but with a single black gorget broken in the middle, as against two more or less complete ones in the male. Singly or pairs, by streams and tanks, perched on rock or or hovering about water.

**Usage**: Feather burnt to ash and dissolved in honey, taken once or twice to treat cough.

**Order**: Passeriformes

**Family**: Muscicapidae

**Species**: *Saxicoloides fulicata* (Linnaeus, 1776)

**Common name**: Indian robin

**Notes:** A sprightly black bird with a white patch on wing (more conspicuous in flight) and rusty red under root of cocked tail. Hen ashy brown with out the wing patch. Pairs, in dry open lightly wooded country. This species is 19cm long, including the long cocked tail. This is a common and tamed bird. It is terrestrial, hopping along the ground. The male sings a few melodic notes during courtship.

**Usage**: Bone of foot ground, dissolved in water and used as eardrop.

**Order**: Passeriformes

**Family**: Accipitridae

**Species**: *Acridotheres tristis* (Linnaeus, 1766)

**Common name**: Indian Myna (Plate 6a.)

**Notes:** The Common Myna measures 23cm - 26cm. A familiar perky, well-groomed dark brown bird with bright yellow bill, legs, and bare skin round eyes. A large white patch in wing conspicuous in flight. Have yellow bills, legs and bare eye skin, brown with a black head. In flight it shows large white wing patches. Sexes alike. Pairs or parties, about human habitations and on country-side.

**Usage**: Flesh cooked and given for children once who are less talk for 1-2 days.

**Order**: Passeriformes

**Family**: Accipitridae

**Species**: *Acridotheres fuscus* (Wagler, 1827)

**Common name**: Jungle Myna

**Notes:** Very like Indian Myna but more greyish brown overall, with similar white wing patches, conspicuous in flight. Absence of bright yellow skin around eyes, and the bushy upstanding tuft of feathers on forehead are diagnostic points. Pairs or parties on well-wooded countryside, seldom about human habitations.

**Usage**: Flesh cooked and given for children once who are less talk for 1-2 days.

**Order**: Passeriformes

**Family**: Corvidae

**Species**: *Corvus splendens* (Viellot, 1817)

**Common name**: House crow

**Notes:** Grey neck and smaller in size. It hoarse ‘caw’. Sexes alike. Seen in single, pairs or in loose parties.

**Usage**: Flesh cooked and given for children once who are less talk for 1-2 days.

**Order**: Passeriformes

**Family**: Corvidae

**Species**: *Corvus macrorhynchos* (Wagler, 1827)

**Common name**: Jungle Crow

**Notes:** A glossy jet-black crow with a heavy bill and deep hoarse ‘caw’. Singly, pairs or loose parties. have a relatively long bill with the upper one quite thick and arched, making it look heavy and almost Raven-like. Generally, all forms have dark greyish plumage from the back of the head, neck, shoulders and lower body. Their wings, tail, face and throat are glossy black. The depth of the grey shading varies across its range to almost black.

**Usage**: Powdered bone suspended in water to prepare eardrop to relieve earache.

**Order**: Coraciformes

**Family**: Bucerotidae

**Species**: *Antracoceros coronatus* (Boddaert, 1783)

**Common name**: Malabar pied Hornbill

**Notes:** A heavy billed arboreal bird with black neck, back and wings, white tips to the flight feathers and white underparts. Tail longish, with outer feathers all white. A

ponderous wax-yellow and black horn-shaped bill surmounted by a casque sharply ridged along top, flat on sides, ending in a point. Female differs only in color details of bare parts. Noisy flocks in fruit-laden trees in well-wooded decidous country.

**Usage**: Flesh cooked and taken in to treat rheumatic pains.

**Order**: Coraciformes

**Family**: Bucerotidae

**Species**: *Buceros bicornis* (Linnaeus, 1758)

**Common name**: Great Pied Hornbill

**Notes:** A large black-and-white hornbill with a massive horn shaped yellow-and-black bill with a large concave topped casque, U-shaped when viewed from front. Face, back, underparts and wings black. Wings with two white bars. Neck, lower abdomen, tail-coverts and tail white. Tail with black sub-terminal band. Feathers of neck and wing bands often tinged yellow from being smeared with exudation of tail gland.

**Usage**: Flesh cooked and taken in to treat rheumatic complaints, arthritis etc.

**Order**: Galliformes

**Family**: Phasianidae

**Species**: *Gallus sonneratii* (Temminck, 1813)

**Common name**: Grey Jungle Fowl

**Notes:** General effect of the cock streaked grey, with a metallic black sickle-shaped tail. Hen having white breast with blackish borders extending to the feathers producing a

scaly pattern. Singly or small parties, in forest and scrub jungle. Male and female birds show very strong sexual dimorphism. Males are much larger; they have large red fleshy wattles on the head and long, bright gold and bronze feathers forming a "shawl" or "cape" over the back of the bird from the neck to the lower back. The tail is composed of long, arching feathers that initially look black but shimmer with blue, purple and green in good light. The female's plumage is typical of this family of birds in being cryptic and designed for camouflage as she alone looks after the eggs and chicks.

**Usage**: Two raw eggs are taken by males before intercourse for the prevention of pregnancy.

**Order**: Galliformes

**Family**: Phasianidae

**Species**: *Pavo cristatus* (Linnaeus, 1758)

**Common name**: Common Peafowl

**Notes:** The gorgeous ocellated ‘tail’ of the adult cock, 1-1.5m long, is in reality the abnormally lengthened upper tail-coverts. Hen also crested like cock, but smaller; mottled brown with some metallic green on lower neck, and lacking the ornamental train. Parties or droves, in decidous forest. Also semi-locally domesticated about villages and cultivation, where protected by religious sentiment.

**Usage**: Feather ash mixed with coconut oil applied over forehead to relieve headache.

**Order**: Columbiformes

**Family**: Columbidae

**Species**: *Streptopelia chinensis* (Scopoli, 1786)

**Common name**: Spotted Dove

**Notes**: White-spotted pinkish brown and grey upperparts, and white and black 'chessboard' on hind neck are leading to its identity. Sexes alike. Pairs or parties, in open wooded country, gleaning in stubble fields, on cross-country cart tracks, etc.

**Usage**: Bits of excreta applied on the belly of children for 2-3 times to treat rickets.

a. *Acridotheres tristis* b. *Athene brama*

c. *Casmerodius albus* d. *Columba livia*

e. *Eudynamys scolopacea* f. *Psittacula cyanocephala*

**Plate 6. Birds**

**MAMMALS**

**Order**: Insectivora

**Family**: Soricidae

**Species**: *Hemiechinus micropus* (Blyth, 1846)

**Common name**: Pale hedgehog (Plate 7b.)

**Notes:** Small rodent-like animal covered with spines except on its face and under parts also with a pig - like snout giving its name. Body is stout and clumsy with short tail, stumpy legs furnished claws. When threatened, it rolls into a ball of bristles. Pale hedgehog is light colored. It has a parting base of spines running from the center of forehead to crown.

**Usage**: Spines of hedgehog are kept in home to get safe from evil spirits. Flesh is edible. Spine powder in coconut oil is applied over wounds for easy healing.

**Order**: Insectivora

**Family**: Soricidae

**Species**: *Suncus murinus* (Linnaeus, 1766)

**Common name**: Grey musk shrew

**Notes:** Head and body six inches and tail three inches. A long pointed snout, projecting considerably beyond lower lip, smaller eyes, rounded depressed ears and a body with soft fur. Feet specially designed for climbing or digging. Teeth are distinctive with two front teeth in the upper jaw curved having more or less prominent basal cusp. In the lower jaw they are long, project horizontally forward and slightly curved upwards at the

end. There is a musk gland on each side of the body behind maxilla, which secretes a strong smell of musk. The soft fur is pale grey or tipped brown or the coat is ashy brown or fawn. Pinkish skin of snout, feet, ears and tail shows through sparse hairs.

**Usage**: Raw flesh is used to treat Asthma.

**Order**: Chiroptera

**Family**: Pteropodidae

**Species**: *Cynopterus brachyotis* (Muller, 1838)

**Common name**: Lesser/ dog faced fruit bat

**Notes**: Leads a solitary mode of life or live in small colonies among palm leaves, aerial banyan roots or tree hollows. It is the only bat that does not live in colonies. *Cynopterus brachyotis* has a fox-like face, large dark eyes, short brown hair, and dark, spotted wings. The length of the head and body in this genus is 70 to 127 mm. The tail adds an additional 6 to 15 mm to the overall length. The forearms of these bats are from 55 to 92 mm long, giving them a wingspan ranging from 305 to 457 mm. Adults weigh about 30 to 100 grams.

**Usage**: Raw flesh is used to treat Asthma.

**Order**: Chiroptera

**Family**: Pteropodidae

**Species**: *Rousettus leschenaulti* (Desmarest, 1820)

**Common name**: Rousettus bat

**Notes:** Head and body, 12.7cm and tail 1.77cm. It is a medium sized bat, light brown in color, occasionally yellowish in color. Older males with dull gray flanks. Completely hairless individuals may be seen during the spring and summer months. The bats have an odour like that of fermented fruit. They have a fairly long muzzle. Also have a claw on the second digit and a well-developed tail. Produce a distinctive clicking call with the tongue for echolocation.

**Usage**: Raw flesh is used to treat Asthma; excreta used as fertilizer known as bat guano.

**Order**: Chiroptera

**Family**: Pteropodidae

**Species**: *Cynopterus sphinx* (Vahl, 1797)

**Common name**: Short-nosed fruit bat

**Notes:** Head and body, 4.4 inches and tail 0.4 inches. It is a medium sized bat, light brown color occasionally yellowish or dull gray brown in color. Older males having a bright reddish or rusty brown collar. The white margined, nearly naked ears and nostrils are divergent are distinctive characters.

**Usage**: Raw flesh is used to treat Asthma; excreta used as fertilizer known as bat guano.

**Order**: Chiroptera

**Family**: Pteropodidae

**Species**: *Pteropus giganteus* (Brunnich, 1782)

**Common name**: Flying fox

**Notes:** Head and body, wingspread about 121.92cm, weight 568-625g. It is a large sized bat. Grows to a wingspan of four feet. Head usually reddish brown with a darker, some times blackish and stout. Hind neck and shoulders pale brownish yellow to straw, behind the shoulders dark brown or black. Ventrally it is yellowish brown. Chin, neck, vent and flanks are darker. Wings black. First digit very long, second digit has a well-shaped claw.

**Usage:** Liver flesh dried in Mustard oil and taken 3 times.

**Order**: Chiroptera

**Family**: Megadermatidae

**Species**: *Megaderma lyra* (Geoffroy, 1810)

**Common name**: Indian false vampire

**Notes:** Head and body 103.63cm, fore arm 65-68 mm and tail absent. A dark ash gray or slat gray bat, paler below with large rounded ears united more than one third their length. The nose leaf has a truncated appearance. Ears are large and connected above rostrum and there is no external tail.

**Usage**: Fat mixed with mustard oil and massaged for 6-8 days once daily. The skin is not eaten, but is dried by the men and made into a wrist-band which brings good luck.

**Order**: Chiroptera

**Family**: Rhinolophidae

**Species**: *Rhinolophus luctus* (Temminck, 1835)

**Common name**: Wooly horseshoe bat

**Notes:** Head and body 9.01 inches, fore arm 66-76 mm in length. Largest species of the genus. The body is long, wooly, and slightly curly. Body is jet black in colour, hairs with ashy black in colour. Fur is long, dense, soft and slightly curled or wooly. It is black with a silvery grizzle or grayish black or rich chestnut brown. The nose is horseshoe shaped and large. Tail is within the large interfemoral membrane.

**Usage**: Tribal eats it any time.

**Order**: Chiroptera

**Family**: Rhinolophidae

**Species**: *Hipposideoros fulvus* (Gray, 1838)

**Common name**: Leaf-nosed bat

**Notes**: It is slaty blue or pale mouse colour, yellowish only beneath. Nasal aperture large, oblong, two at the tip, reaching to the base of the ears with a fold down the center. Tragus two-lobed, anterior lobe pointed, twice as high as the posterior, which is rounded. Muzzle is truncated under lip cleft. Nose is furnished with a complicated membranous apparatus. There is no tail. Interfemoral membrane is cut square. Sucks in blood from other bats, during flight.

**Usage**: Tribals eat it at any time.

**Order**: Chiroptera

**Family**: Vespertillionidae

**Species**: *Kerivoula picta* (Pallas, 1767)

**Common name**: Painted bat

**Notes:** Very small bat and beautiful due to its brilliant coloration. Body colour is bright orange or ferruginous. The orange colour is extended up to the wings along the fingers and flanks. Wings membranous, inky black with orange stripes along the fingers. Ears funnel-shaped. Tragus is very long and transparent.

**Usage**: Flesh is used to treat breathing troubles.

**Order**: Primates

**Family**: Colobinae

**Species**: *Presbytis johnii* (Fischer, 1829)

**Common name**: Nilgiri Langur

**Notes:** A glossy black or blackish brown langur with a yellowish-brown head. The rump and base of tail may be grizzled. Females distinguished by the presence of a patch of hair seen on the inside of the thighs seen even in ten-day-old infants. Youngones are reddish brown until ten weeks of age, then turns jet-black.

**Usage**: The skin is used to make a small container for snuff.

**Order**: Primates

**Family**: Cercopithecinae

**Species***: Macaca radiata* (E. Geoffroy, 1812)

**Common name**: Bonnet macaque

**Notes:** Medium sized long tailed macaque. A bonnet of long dark hairs radiates in all directions from a whorl on its crown. It does not cover forehead, where hairs are short and neatly parted in the center. The coat is variable. In the cold weather it is lustrous olive-brown, the under parts whitish. In hot weather the coat turns harsh and scraggy and fades to buffy grey.

**Usage**: Flesh is edible. Fresh blood is taken to treat Tuberculosis.

**Order**: Primates

**Sub order**: Leminroidea

**Family**: Loridae

**Species**: *Loris tardigradus malabaricus* (Linnaeus, 1758)

**Common name**: Slender loris

**Notes:** Body length 20.32 to 25.40 inches, tail absent or a mere suggestion. Weight of males is about 280-340g and females of about 225g. The limbs are longer and slender, large ears, the snout more pointed. The eyes are more close set. The fur is more soft and woolly. Eyes circled with black or dark brown. Muzzle white. Have a lean and lanky appearance with the size of a kitten. It is dark grey to reddish brown with an embellishment of silvery hairs on the back and white or buff on undersurface. Seen solitary or in pairs and is nocturnal.

**Usage**: Tribal take it as food.

**Order**: Pholidota

**Family**: Manidae

**Species**: *Manis crassicaudata* (Gray, 1827)

**Common name**: Indian Pangolin

**Notes:** The upper part of the head, back, and sides of body, tail, and side of the limb are covered with large overlapping scales. The scales of pangolin are the modified hairs enormously curled and flattened. Feet are furnished with long, somewhat curved and blunted claws for digging. Eyes are small and ears rudimentary. This has been reported from all over the State but the number is on the decrease as evident from the low sighting the animal as well as indirect evidences.

**Usage**: Tribals take it as food.

**Order**: Rodentia

**Family**: Sciuridae

**Species**: *Funambulus palmarum* (Linnaeus, 1766)

**Common name**: Three striped palm squirrel (Plate 7a.)

**Notes:** Head and body 14.22-15.6 cm, tail slightly longer. It is distinctive in having three stripes on its back. A number of local races of these squirrels are recognized. It is very active and can be seen running up and down trees, buildings and parks all day long.

**Usage**: Intestine cooked and eaten against poison.

**Order**: Rodentia

**Family**: Sciuridae

**Species**: *Funambulus tristriatus* (Waterhouse, 1837)

**Common name**: Jungle-striped squirrel

**Notes:** Largest species of the genus *Funambulus* (Ellerman, 1961). Skull large, occipital nasal length exceeds 40mm and palate more than half of that. There are clear light stripes on the back, three in number and the under parts are light or whitish. Tail is most often shorter than the head and body. Hands and feet are with out any special peculiarity. Fourth finger is usually dominant in the hand. This species is endemic to Western Ghats.

**Usage**: Tribals take it as food.

**Order**: Rodentia

**Family**: Muridae

**Species**: *Mus musculus* (Linnaeus, 1758)

**Common name**: House mouse (Plate 7c.)

**Notes:** Body measures about 2-3 inches long tail and is equally long. Colour varies from dark to light brown, paler below. A small, scaly-tailed mouse with a distinct notch in the cutting surface of upper incisors. Hair short. Ears moderately large and naked; upperparts ochraceous, suffused with black. Belly is buffy white, or buffy, usually without speckling and with slaty underfur. Yellowish flank line usually present. Tail brownish with black tip, not distinctly bicolor, but paler on underside. Ears pale brown, feet drab or buffy, tips of toes white. Mammae are present in four or five pairs.

**Usage**: Tribals take it as food.

**Order**: Rodentia

**Family**: Muridae

**Species**: *Mus famulus* (Bonhote, 1898)

**Common name**: Bonhote's mouse

**Usage**: Used as food.

**Order**: Rodentia

**Family**: Muridae

**Species**: *Mus saxicola* (Elliot, 1839)

**Common name**: Elliot's mouse

**Usage:** Flesh is edible.

**Order**: Rodentia

**Family**: Muridae

**Species**: *Bandicota indica* (Bechstein, 1800)

**Common name**: Large bandicoot rat

**Notes:** It is having a rounded head and ears and a short broad muzzle. Have a habit of erecting its piles of long hairs and grunting when excited. It is parasitic on man living in or about human dwellings. They are of large size measuring about 12-15 inches from nose to base of tail, the tail is but equally long.

**Usage**: Tribal takes it as food.

**Order**: Rodentia

**Family**: Muridae

**Species**: *Bandicota bengalensis* (Gray & Hardwicke, 1833)

**Common name**: Lesser Bandicoot rat

**Notes:** Head to body 15.24-22.66cm tail 12.70-17.78cm in length. Its head and ears are rounded, rounded and muzzle short and broad. It is easily distinguished from other by its smaller size. Hand with four fingers, all clawed and foot with five toes, all clawed. The general body colour of its coat is grayish brown speckled with buff and undersides paler.

**Usage:** Meat is cooked in mustard oil and this oil is cooled and applied in leucoderma. Flesh is edible.

**Order**: Rodentia

**Family**: Muridae

**Species**: *Rattus rattus* (Linnaeus, 1758)

**Common name**: Roof rat / white-bellied rat

**Notes:** It is the medium-sized species with the tail normally wholly dark in colour and normally longer than the head and body. The skull with very long palate, considerably more than half the occipital nasal length.

**Usage**: Flesh is cooked and eaten.

**Order**: Rodentia

**Family**: Muridae

**Species**: *Rattus blanfordi* (Thomas, 1881)

**Common name**: White tailed wood rat

**Notes:** Long tail, usually exceeding 12% of the head and body length. Tail is well haired and tends to be tufted terminally. Fur is soft. Colour of the back varies from light brown to gray. Belly and under parts white. Feet are most often white. Hand is with four-clawed fingers and foot with five-clawed toes.

**Usage**: Flesh is cooked and eaten.

**Order**: Rodentia

**Family**: Muridae

**Species**: *Hystrix indica* (Kerr, 1792)

**Common name**: Indian porcupine

**Notes**: Largest rodent found in India. Head and body 71.12 to 88.90cm; tail 7.62 to 10.16cm, with its spine 17.78 to 20.32cm and weight 11 to 18 kg. Body is covered with spines, which are the modified hairs. Tail short, usually one fifth of head and body length. Hands and foot broad with claws. Claws covered by bristles.

**Usage**: Flesh is cooked and eaten, spine powder used as wound healing agent.

**Order**: Carnivora

**Family**: Viverridae

**Species**: *Viverricula indica* (Desmarest, 1804)

**Common name**: Small Indian Civet (Plate 7f.)

**Notes:** A full grown male is slightly over three feet in entire length and body weight 3 to 4 kg. Body colour is tawny gray or grayish brown. There are usually some cross bars on the neck. Absence of dorsal crest distinguished it from large Indian civet.

**Usage**: Flesh is cooked and eaten which is remedy for breathing troubles. Soup prepared from the flesh is remedy for general weakness.

**Order**: Carnivora

**Family**: Viverridae

**Species**: *Paradoxurus jerdoni* (Blanford, 1885)

**Common name**: Brown palm Civet

**Notes:** Face is uniformly coloured or with faint traces of grey speckling, but without definite grey pattern. The body on the average is less conspicuously speckled with grey-tipped or buff-tipped hairs. The body colour varies from glossy brown to dark brown with black behind the shoulders, the flanks and belly speckled with clear grey and sane grey in front of the ears. The animal has a white tail tip and some yellow at the base of the tail.

**Usage**: Flesh is cooked and eaten which is remedy for breathing troubles. Soup prepared from the flesh is remedy for general weakness.

**Order**: Carnivora

**Family**: Viverridae

**Species**: *Paradoxurus hermaphroditus* (Pallas, 1777)

**Common name**: Common palm Civet

**Notes:** One of the commonest viverrid widely distributed throughout both in the forests and habitations including urban areas. There seems to be a seasonal change in the coat colour, the inferior coat being blackish as evident from the specimen observed in the Elayur near Manjeri. The change in coat colour leads to the identification of the animal as "Bhuthakkali Veruku" considering it as different from the usual toddy cat. The animal is widely distributed in good numbers in all the areas sampled as evident from the indirect evidences and sightings.

**Usage**: Flesh is cooked and eaten which is remedy for breathing troubles. Soup prepared from the flesh is remedy for general weakness.

**Order**: Carnivora

**Family**: Mustelidae

**Species**: *Lutra lutra* (Linnaeus, 1758)

**Common name**: Common otter, Eurasian otter

**Notes:** Tail is thick and muscular. Feet are paddle like and the hind limb is larger than fore limb. Body is stream lined and almost cylindrical. Head is broad and flattened. Ears are small and nostrils valvular to prevent the entry of water. The hind teeth are furnished with sharp cusps and are adapted for piercing and crushing hard scales and

retaining on slippery prey. Body covered with hairs and hairs of muzzle terminate above the naked nose in an angular or zigzag line.

**Usage**: Eating flesh relieves asthma and chest pain .The dried secretion of common otter obtained from the perineal sac is useful ethnomedicine. It is used in rheumatism, joint and waist pains and to improve eyesight.

**Order**: Carnivora

**Family**: Mustelidae

**Species**: *Aonyx cinerea* (Illiger, 1815)

**Common name**: Small claw less otter

**Notes:** Smallest of our otters. Head and body 45-55 cm; tail 25-30 cm and weigh 3-6 kg. The claws are rudimentary no more than small upstanding spikes, which except in small cubs, do not project beyond the toe pads. Colour is dark brown above and paler below.

**Usage**: Flesh is cooked and eaten which is remedy for breathing troubles. Soup prepared from the flesh is remedy for general weakness.

**Order**: Carnivora

**Family**: Mustelidae

**Species**: *Martes gwatkinsi* (Horsefield, 1851)

**Common name**: Nilgiri Marten

**Notes:** It is having proportionately longer tail measuring three-fourth the length of head and body. The colour varies among individuals and with season. Dorsal fur is variegated with deep brown from head to rump, the forequarters being almost reddish.

**Usage**: Flesh is cooked and eaten for general weakness, asthma.

**Order**: Carnivora

**Family**: Herpestidae

**Species**: *Herpestes fuscus* (Grey, 1837)

**Common name**: Short-tailed mongoose

**Notes:** It is large and heavily built and blackish brown mongoose, more or less speckled with yellow or tawny. Paws are almost black. Have a relatively shorter tail which is only about two-thirds the length of the head and body. The contour hair are less harsh and the upper half or third of the soles of the hind feet are covered with hair throughout the year. The length of the head and body is around 500 mm, tail 300 mm and weight about 2.7 kg

**Usage**: Flesh is cooked and eaten and the animal is used as game animal.

**Order**: Carnivora

**Family**: Herpestidae

**Species**: *Herpestes vitticollis* (Bennet, 1835)

**Common name**: Stripe necked mongoose

**Notes:** Largest of all Asiatic mongooses. The total length of the body is 3 feet and weighing about 3.2 kg. Distinctive character of this mongoose is the presence of black neck-stripe reaching backwards from the ear to the shoulder. Coat colour is grizzled grey, tipped with chestnut red and increasing in intensity on the hindquarters.

**Usage:** Fat massaged for 4-5 times for one week to treat rheumatic pain.

**Order**: Carnivora

**Family**: Herpestidae

**Species**: *Herpestes edwardsi* (E. Geoffroy Saint-Hilaire, 1818)

**Common name**: Indian mongoose / Grey mongoose (Plate 7d.)

**Notes:** Total length nearly 3 feet including the tail and average weight of 1.4kg. Considerably large and is easily distinguished in the field by its longer contour hairs which form almost a cape along the flanks and over the hindquarters. Head is characteristically conical with the fore crown sloping straight to the pointed nose. Body colour is tawny yellowish grey with no stripes on the sides of its neck. The alternate dark and light rings on its hairs give a grizzled 'pepper salt' tinge. Tail is long tipped with white or yellowish red.

**Usage:** Tribes cut the penis of the mongoose, roast and eat to overcome impotency. Meat is used as a remedy for rheumatic and other body pains.

**Order**: Carnivora

**Family**: Felidae

**Species**: *Felis chaus* (Schreber, 1833)

**Common name**: Jungle cat

**Notes**: Body length two feet, and tail about one foot and weight 5-6 kg. Size comparatively larger than domestic cat. Legs are long and tail short. Its distinguishing features are the bands on the tail and legs. Colour of eye is pale green. Colour of fur varies from grey to yellowish grey. Paws are pale yellowish black or sooty brown underneath. Ears are reddish and have small pencil-black hairs. A dark band runs down from the inner lower corner of each eye down to the nose on either side. In sub adults, there were dark bars on inner aspects of upper half or the fore limbs and on abdomen.

**Usage**: Flesh is edible; hair roasted and powdered in coconut oil is applied to treat leucoderma.

**Order**: Carnivora

**Family**: Felidae

**Species**: *Prionailurus viverrinus* (Bennet, 1833)

**Common name**: Fishing cat

**Notes:** Body is covered with short earthy grey fur fused with brown. A series of elongate spots are arranged in longitudinal rows with varying size and sharpness. Six to eight dark lines run from the forehead over the crown to the neck, breaking up into shorter bars and spots on shoulders. Cheeks are grayish white with two horizontal black or brown stripes. Two dark bars are present on the inside of fore arm. Lower parts of the body are spotted and tail is ringed with black. Forefeet have well developed web and

toes. Claw sheath are not large enough to completely envelop the retracted claws. Its tail and legs are short.

**Usage**: Yeilding fur; flesh soup is used to treat general weakness.

**Order**: Carnivora

**Family**: Felidae

**Species**: *Prionailurus rubiginosus* (I.Geofroy Saint Hilaire, 1831)

**Common name**: Rusty-spotted cat

**Notes**: This cat is about half or three quarters of the size of domestic cat. It is slightly built and active creature with soft smooth fawn grey coat, patterned with brown bars and spots arranged in more or less regular lines. The marking on its head and shoulders are dark brown and they change to rusty on the flanks and are reduced to smaller round spots on the hindquarters. Under parts are nearly white with black spots. Its tail is unmarked which distinguishes it from leopard cat. Weight is only 1-2kg.

**Usage**: Yeilding fur, flesh soup is used to treat general weakness.

**Order**: Carnivora

**Sub order**: Aeluroidea

**Family**: Felidae

**Sub family**: Felinae

**Species**: *Prionailurus bengalensis* (Kerr, 1792)

**Common name**: Leopard cat

**Notes:** It is one of the forest dwelling lesser cats. Ground colour and pattern vary individually, from ochreous-buff to buffish white on the flanks, but typically darker on the head and back. Spots on the flanks are typically large and well spread. The stripes on the back also vary, particularly the broad ones on the shoulders. The tail typically exceeds half the length of the head and body more than twice the length of the hind foot. Ears are more rounded and shorter.

**Usage**: Yeilding fur; flesh soup is used to treat general weakness.

**Order**: Lagomorpha

**Family**: Leporidae

**Species**: *Lepus nigricollis* (F.Cuvier, 1823)

**Common name**: Black napped hare (Plate 7e.)

**Notes:** Head and body 518 cm to 579.12 cm in length and body weight 1.8 to 2.3 kg. Presence of a dark or black patch on the back of its neck from the ears to the shoulder is a distinctive character. Upper surface of the tail is black. Have a paler sandy-buff coloration, lacking rufescent tinges and particularly have no trace of a collar of black hairs in the region of lower neck. Upper lip is split and the incisors are covered with white enamel.

**Usage**: Yeilding fur; flesh soup is used to treat general weakness

**Order**: Artiodactyla

**Family**: Tragulidae

**Species**: *Tragulus meminna* (Erxleben, 1977)

**Common name:** Mouse deer

**Notes:** Height at shoulder is 2.54 –33.02 cm. Mouse deer have no front teeth in the upper jaw. They have four well-developed toes on each foot. Limbs are slender. Its coat colour is olive brown minutely speckled with yellow. The lower parts are white. The throat has three white stripes. The flanks are marked with rows of buff or white spots, which elongate and pass into longitudinal bands.

**Usage**: Flesh soup is used to treat general weakness.

**Order**: Artiodactyla

**Family**: Suidae

**Species**: *Sus scrofa* (Linnaeus, 1758)

**Common name**: Indian Wild Boar

**Notes:** Has a sparser coat and in its fuller crest or mane of black bristles reaching from the nape down the back. Colour is black mixed with grey, rusty brown and white hairs. Young are browner and old are grayer. Newborns are brown with light or black stripes. Tushes are well developed in males. Both the upper and lower tushes curve outwards and project from the mouth.

**Usage**: Pig fat is applied in paralysis, joint pains, burns and fractures.

**Order**: Artiodactyla

**Family**: Cervidae

**Species**: *Axis axis* (Erxleben, 1977)

**Common name**: Chital or spotted deer

**Notes:** It is perhaps the most beautiful of all the deer. Its coat is bright rufous-fawn profusely spotted with white at all ages and seasons. Old bucks are more brownish in colour and darker. Lower series of spots on the flanks are arranged in longitudinal rows and suggest broken linear markings. They have three tines, a long brow tine set nearly at right angles to the beam and two branch tines at the top. The outer tine is always longer.

**Usage**: Fat of deer massaged by tribes in piles and burns; antlers are used to hang up cradle for baby.

**Order**: Artiodactyla

**Family**: Suidae

**Species**: *Cervus unicolor* (Kerr, 1792)

**Common name**: Sambar deer

**Notes:** Largest Indian deer and carries the grandest horns. The coat is coarse and shaggy. General colour is brown with a yellowish or grayish tinge. The under parts are paler. Females are lighter in tone. The antlers are stout and rugged. The brow tine is set at an acute angle with the beam. At its summit, the beam forks into two nearly equal times. The full number of points is developed in the fourth year.

**Usage**: Fat is massaged in asthma and rheumatism. Flesh is edible. Antelopes powdered and mixed with honey are used to treat vomiting in children.

**Order**: Artiodactyla

**Family**: Suidae

**Species**: *Muntiacus muntjack* (Zimmerman, 1780)

**Common name**: Barking deer

**Notes:** The antlers are short consisting of a short brow tine and an unbranched beam. They are set on bony hair covered pedicels that extend down each side of the face as bony ridges. In does bristly hair replaces the horns. Old males are browner in colour. Upper canines of males are well developed and are used by the animal in self-defence.

**Usage**: Leg soup facilitates delivery and fat is massaged to treat body ache.

**Order**: Artiodactyla

**Family**: Bovidae

**Species**: *Bos gaurus* (Smith, 1827)

**Comon name**: Indian Bison / Wild Gaur

**Notes:** It is having a huge head, deep massive body and sturdy limbs and its shows its vigor and strength. Have the muscular ridge upon its shoulders, which slopes down to the middle of the back where it ends in an abrupt dip. New borns are light golden yellow, which soon changes to fawn, then to light brown, and so to coffee or reddish brown, the colour of young bulls and cows. Older ones are jet black and almost hairless.

An ashy fore head and yellowish or white stockinged feet complete the livery. Eye colour is brown.

**Usage**: Urine is taken to cure paralysis. Dung boiled in coconut oil, which promotes hair growth.

**Order**: Proboscidae

**Family**: Elephantidae

**Species**: *Elephas maximus* (Linnaeus, 1758)

**Common name**: Asian elephant

**Notes:** Smaller than African elephant. Have huge ears, hollow back and four nails on each hind foot. Trunk ends in a single 'lip'. Only males have large tusks. Tusks of female scarcely protrude or protrude a few inches. Tusk less males are very large in build with extra- ordinarily well-developed trunks.

**Usage**: Teeth powder is good remedy for toothache. Fumigation of elephant dung is useful to eliminate mosquitoes. Teeth is also used to make ornaments like bangles.

a. *Funambulus palmarum* b. *Hemiechinus micropus*

c. *Mus musculus* d. *Herpestes edwardsi*

e. *Lepus nigricollis* f. *Viverricula indica*

**Plate 7. Mammals**

### 5.2 Methods of collection and utilization of animal resources

There are a large number of methods used by poachers to trap or kill animals. This is dependent on the species that is to be caught and the final marketing.

**PIT POACHING** (Large mammals)

Pits of suitable sizes would be dug up on the paths of the animals. Sharp bamboo splinters would be erected at the bottom of the pits so that whenever an animal falls into the pit it will be trapped and killed.

**POISONING** (Large herbivore, big cats)

Poisoning the animals with poisons with herbal and chemicals is a common practice for killing large herbivores like wild pigs and big cats like tiger and panther. The poison is mixed in food and deposited in the animal corridors. Once the animals are dead the poisoned parts are removed and the remaining flesh is cooked and eaten.

**ARCHERY** (All kinds of birds, mammals)

Archery with bows and arrows is a common practice among the tribes for the collection of mammals like deer, civets, and lesser cats. This is the main method for killing birds. At times the arrows are poisoned for easy collection.

**TRAP AND SNARE** (Mammals and reptiles)

Trap is a mechanical device for the snaring and catching of wild animals and snares are represented as a rope tied to a tree branch coming down to form a circle on the ground and are one of the simplest and most effective traps. Foothold trap is made

up of two jaws; a spring of some sort, and a trigger in the middle and some kind of lure is used to position the animal or is set on the animal trail. When the animal steps on the trigger the trap closes around the foot, preventing the animal from escaping. Cage traps are live cages; they are usually baited. They have a trigger that is located in the back of the cage and it triggers a door to shut, preventing the animal from escaping.

**STICK AND GLUE** (Fast flying birds)

This method is mainly used for the collection of birds. Sticks with sticky glues are fixed in different parts of the forest with some grains for the attraction of birds. Once the birds sit on these sticks, they are stuck because of the glue and the tribes collect the birds.

**TAKING YOUNG AND EGG FROM NEST HOLES** (Birds and reptiles)

The young ones of birds taken from their nests is a usual practice done by the people. Also they search for the eggs of birds and reptiles from the nests and their holes being done manually for their food.

**HARPOONING** (Turtles)

Harpooning is a traditional method for catching large fish - and it’s still used today by skilled fishermen. When a harpooner spots an organism, he or she thrusts or shoots a long aluminum or wooden harpoon into the animal. Harppons are tipped with a barb that is attached to a long line with a buoy at the end. The line is free of the boat, and organisms are followed with the assistance of the buoy until they tire and can be hauled aboard.

**DIGGING FOR UNDER GROUND ANIMALS** (Snakes, lizards, porcupine, etc.)

Digging in the animal corridors is a common practice for the collection of mammals like porcupine, rodents like Bandicoot rat, shrews and reptiles like non-poisonous snakes and lizards that are used as delicious food.

**NET** (Small birds, small mammls and butterflies)

Netting is a practice used for the collection of flying birds, butterflies, bats, etc. The nets are fixed in the open canopy of forest trees during evenings and animals crossing over the nets are trapped. The animals are collected next morning. Trapping with iron nets and snares are used sor the collection for terrestrial mammals like hares, mongooses, lesser cats, civets etc.

Traditional fishermen catch the fishes with nets and different kinds of bamboo traps, pots and even with bare hands in many pars of South India. Incidental killing of non-target organisms also occur in all these methods. The destructive methods of fishing have been used in fresh waters of India. Kader (1989), while discussing the fisheries of Thrissur, Kerala indicated the fishing methods employed in inland waters.

The tribals depending on the season employ different fishing methods. An evaluation of the fishing methods used by the tribals is attempted to assess their sustainable value. The survey was conducted to collect information on the methods employed, fishes exploited, time and season of operation and effort required.

The methods of fishing employed by the tribal communities in the area include both non-destructive and destructive ones.

**Non-destructive methods of fishing**

Rod and line method is usually employed in larger streams and stagnant water holes. The species collected by the rod and line method include *Mystus punctatus, Mystus cavasius, Puntius camaticus*. Arrowing is also used for the capture of fishes from streams.

**Destructive methods**

**Thotta (Fish dynamite):** The method is mostly employed by the non-tribals and applied in stagnant rocky pools in rivers and streams. After applying these, 2-3 persons will dive to collect the fishes. Medium to large sized fishes are collected and juveniles normally discarded. Sometimes, thotta is specifically used in selected spots where species like *Channa marulius* and *Marulius attu* are abundant. This method is highly detrimental to juveniles of fishes and other aquatic fauna and is normally used by non-tribals in the area or by the visitors from far away places coming for the purpose.

**Karrakai (*Randia brandisii*):** The fruits of *Randia brandisii* are collected from the forest and crushed. Nearly 5-6 kilogram is normally used. Usually medium sized fishes are catched by this method. The method is commonly employed in summer season when the water level is low. Almost all the tribes use this method.

**Thodan valli (*Acacia torta*):** This climber is crushed in water till surf develops. About 5-6 kilogram is used for poisoning. The extract is applied in the water with the help of 5-10 persons. After half an hour, fishes lose their balance and are collected using

common traps like the Koortha. The method is applied in stagnant or slow running waters. Paniyans usually employ this method.

**Mula or Illy (Bamboo, *Bamboosa* sp.):** The tender shoots of bamboo are collected, crushed and mixed with water. Nearly 50-70 tender shoots are used for a single operation and are normally employed during the months of January-March. Sometimes copper sulphate is also added to this for quick action and prolonged sedation time for fishes. They apply this method in slow flowing or stagnant waters. Almost all the tribes except Kurichiyar adopt this method.

**Njaval (*Syzigium caryophyllaeum*):** The bark of the tree, *S.caryophyllaeum* is collected from the forests, squeezed and mixed in the stream. After half an hour the fishes become unconscious and are collected using traditional traps like Koortha. Nearly five kilogram of bark is required for a single operation. Paniyans and Naikans are experts in making this mixture.

**Thirukkalli (*Euphorbia* sp.):** The plant is collected and put on the surface of stagnant water. The sap oozed out from the plant is detrimental to fishes. About 5-10 kilogram of plants is used for a single operation.

**Tobacco (*Nicotiana* sp.):** The tobacco is cut into pieces and applied. Six kilogram would be required for a single operation. Kurumar employs the method during summer season in stagnant waters.

**Ash-kalkothi (*Gnidia glauca*)-Njaval**: The bark of Njaval and leaves of Kalkothi is mixed with ash and applied into water. The sedated fish are collected using traditional traps and gears.

**Sopum-kay (*Sapindus sp.*)**: The fruits of *Sapindus sp.* are crushed to powder form in fresh condition and mixed with with water. This method is normally employed in summer.

**Cheenykkay (*Acacia rugata*):** The bark of this climber is collected and crushed and thrown into water. This is applied in February –March season. Nearly two bundles (10 kilogram) are used for a single operation.

**Nanjukuru – Green chilly – Copper sulphate:** Nanjukuru and Green chilly are crushed along with copper sulphate and the mixture is thrown into the stream. After half an hour, the fishes die or become unconscious and are collected using common traps or by using hand picking.

**Cheera paranki (Green chilly):** About one kilogram of green chilly collected from the market is used for operation. The chilly is crushed along with the Nanjumkay and applied in water. This is a highly detrimental method and the whole area is destroyed. Copper sulphate may also be added to reduce the time to sedate.

**Marrotti (*Hydnocarpus pendandra*):** The leaves and the fruits of the plant are crushed and mixed together. The mixture is applied in the stream. Fruit alone is also sufficient for the operation. This technique is usually practiced during summer season.

### 5.3 Sustainable use of Animal resources

In Kerala, tribal people usually do not know that some of the wild animal resources they regularly use are endangered species. Although their hunting, slaughtering, and trading have been prohibited, wild populations continue to be used nutritionally, medicinally and for domestic purposes in a clandestine way. Of the total number of species recorded, most organisms are not under extinction risk. On the other hand some, which are officially considered as threatened species by IUCN (2000), were found among the set of faunistic resources prescribed as medicines at the time of this research. From the study it is known that four species of mammals are endangered, nine are vulnerable and one that is data deficient.

These animals have become charms and remedies used not only in Kerala but also throughout the country. Apparently, these species have not become endangered because of their perceived therapeutic value. Instead, forests have experienced much deforestation over the centuries resulting from a disordered exploitation of the natural resources due to wood extraction and itinerant cattle breeding practices. This has decreased the vegetal covering and also the number of wild populations. The record of 107 medicinal animals in Kerala represents strong evidence of the traditional use of wildlife resources. According to Silva and Marques (1996), the phenomenon of zootherapy is relevant because it implies additional pressure over critical wild populations. Oldfield (1989) argues that many animal species have been overexploited as sources of medicines for the folk medicine trade. In addition, she also attests that animal populations have become depleted or endangered as a result of their use as

experimental subjects or animal models. For this reason, sustainability is now required as the guiding principle for biological conservation. According to the IUCN draft *Guidelines* (Glowka, Burherme-Guilmin and Synge 1994), the exploitation of a given species is likely to be sustainable if:

• *It does not reduce the future use potential of the target population or impair its long-term viability;*

• *It is compatible with maintenance of the long-term viability of supporting and dependent ecosystems; and*

• *It does not reduce the future use potential or impair the long-term viability of other species.*

Zootherapeutic activity, if properly managed, can be compatible with an environmental conservation program in which the use of natural resources can and must occur in such a way that human needs and protection of biodiversity are guaranteed. For this reason, zootherapy should be viewed within its cultural dimension (Costa-Neto, 1999b). This cultural perspective includes the way people perceive, use, allocate, transfer, and manage their natural resources (Johannes, 1993). Since people have been using animals for a long time, suppression of use will not save them from extinction. In accordance with Kunin and Lawton (1996), those species directly involved in traditional medicines should be among the highest priorities for conservation. These authors argue that some of the species are endangered precisely because they are of value to us. Since a basic principle governing the use of natural resources is that the extraction rate of a

renewable resource should not exceed the renovation rate of that same resource, perhaps a suitable alternative for the diminishment of wild resources from overexploitation would be through the localization of natural compounds that have been successfully tested for pharmacological action. Thus, the production of artificial substitutes in the laboratories would displace human dependency on animal medicines (Oldfield, 1989). In connection to this, we have to realize that the negative impacts on biological diversity should not be restricted only to the traditional users, but should be extended to the use by the pharmaceutical industries (Marques, 1996). Another alternative for the recovery of endangered species is to turn them into manageable resources in the way of traditional farming systems, where they would be reared using both folk and scientific techniques (Costa-Neto, 1999b). Meanwhile, some conservation measures based on the community's reality should be taken, such as: rotational use of hunting; taboos on hunting or harvesting certain species; limitations on *caatinga* clearance; and use of particular agricultural techniques which lower the impact of the use or even increase biological diversity. While discussing how to conserve the biological resources we face two general antiethical approaches: one that deals with the extrinsic values of species and another that views diversity as having an intrinsic good for its own sake (Buchdahl and Raper, 1998). Those who follow the first approach claim that biodiversity must be preserved because doing otherwise would harm humanity (anthropocentric view). Thus, diversity in nature is of some instrumental value in advancing human interests and well-being, either now or in the future (Costanza and Daly, 1995; Kunin and Lawton, 1996). The second approach debates the issue of biodiversity from a moral point of view by

arguing that diversity of life on Earth is to be protected independent of any utilitarian reasons (ethical view). Ehrlich and Ehrlich (1992) point out that biotic diversity should be valued for four general reasons: ethical, aesthetical, direct economic, and indirect economic. One may ask, “Could the zoo origin products from Kerala be viewed from a less anthropocentric perspective and seen as having intrinsic value?” In this regard, we agree with Swanson’s statement (Oksanen, 1997) that the protection of biodiversity results from the right use of its resources (Costa-Neto and Maria, 2000).

According to Marques (1996), researchers carrying out studies on ethnozoology should pay attention to three ethical issues. The first deals with the intellectual property rights of the primary owners of the folk knowledge. As stated by McGirk (1998), the Convention on Biological Diversity recognizes that indigenous and traditional people should receive some reward if a drug company or an agribusiness firm develops a product based on traditional resources or knowledge. The second issue regards the well being of the useful animals. And the third one deals with the sustainability of the implied resources. In recent years a growing body of literature recognizes that the cultural perspectives should also be taken into account in every debate focused on sustainable development (Morin-Labatut and Akhtar, 1992; Agrawal, 1995). These cultural perspectives include the way people perceive, use, allocate, transfer, and manage their environment (Johannes, 1993). Thus, discussing zootherapy within the multidimensionality of the sustainable development turns out to be as one of the key elements in order to achieve the sustainability of the medicinal faunistic resources. Since people constitute an essential component of the landscape and their activities are

fundamental for its long-term compatible use, biological conservation policy should be built upon both anthropocentric and non-anthropocentric bases.

The traditional ecological knowledge on the technologies of farming, forestry, hunting, trapping and the intimate relationship with environmental system as a whole has immense value in conservation. This traditional knowledge would also help in the sustainable utilization of the natural resources. Apart from the beliefs, there are many cases, which prove that the traditional methods of hunting and harvesting are not sustainable. Daniels and Vencatesan (1995) have discussed the relevance of TEK – Traditional Ecological Knowledge in the context of recent developments in biodiversity conservation. They have also cited examples to support and contradict the sustainability value of traditional ecological knowledge. They have also stressed the need to collect and analyse the data with a scientific scrutiny and interpretation. They conclude by quoting Kenneth Ruddle, from his writing for UNESCO “The romantic and uncritical espousal of traditional knowledge and management is as extreme as unfortunate as that of dismissing it”.

## 5.4 Wildlife Trade

The most beautiful gift that God has given to nature are the wild creatures, they embellish the natural beauty by their unique way of existence. Although Wildlife Conservation in India dates back more than two thousand years, the fact that India plays an active role in the trade in wild animals and plants was not generally known till recently. India is an importer, exporter and a transit for wildlife that enters the $25 billion per annum in global animal trade. India is one of the earliest members of the Convention on International Trade in Endangered Species of wild fauna and flora (CITES), thereby pledging international support to an ideal. Both its domestic and international policy on wildlife, India has retained the strong conservation ethics that are part of the country's history and tradition.

Wildlife trade includes the non-timber forest products i.e. live animals or their parts, products and derivatives, including plant extracts and parts of animals used in medicines. Live animals form only a part of wildlife trade. This can be at the local village level, regional retail and wholesale levels or international import and export levels. This act is illegal but it ranks the second position in the global value as given by international enforcement agencies the first being the narcotics (Sharma, 2004). Regulation of international movement (exports and imports) of wildlife and wildlife products is acknowledged internationally as an important element of effective nature conservation. Commercial export of regulated wildlife and wildlife products may occur only where the specimens have been derived from an approved source (captive breeding

program, artificial propagation program, aquaculture program, wildlife trade management operation, or wildlife management plan).

The value of trade in plants and animals has been approximated at between $10 and 20 billion worldwide in 1996, the United States being the largest consumer of wildlife at about $3 billion. The world market for wildlife includes more than 4000 primates, ivory from 90000 tuskers, one million orchids, four million live birds, ten million reptile skins, over 250 million tropical fish and other diverse items.

India has 32.87 lakh sq.km. of land area occupying 2.4 percent of worlds' and holds about 8% of the world's life forms - including 350 species of mammals, 197 amphibians, 1224 birds, 408 reptiles, 2546 fishes, 57548 insects and over 46000 species of plants. Over 586 protected areas covering 156392 sq.km are home to 50% of world's tiger population, 65% of Asiatic elephants and 80% of all Asian one-horned rhinos. The wildlife trade threatens survival of many wildlife species valued for aesthetic, biological and natural worth and thus forms a great threat to global biodiversity. This is the case in India as there is great biodiversity that is in a threatened situation.

Much of the animals like leopard, tiger, elephants, deers, rhinoceros etc. are being slaughtered for their skin, antlers, etc. Also birds like peacocks, parrots, and other domestic animals, reptiles, butterflies, frogs, etc. are also being used for trade. Trade in endangered wildlife is driven by consumer demand and is trading the planet's natural heritage towards extinction. A quarter of this trade is thought to be illegal. The global wildlife trade includes primates, ivory from African elephants, orchids, live birds, reptile skins, butterflies, animal furs, and tropical fish. Recently (Mathrubhumi Daily,

2006), it is reported from Nilambur forests in Malppuram district of Kerala that criminals had been captured for the culprit of capturing 300 organisms including endemic butterfly species like ‘Paris peacock’, ‘Common nawab’, ‘Cruiser’, ‘Southern world wing’ etc.

Regulation of wildlife crime and smuggling is being done from the constitutional level. The Directive Principles of State Policy under article 48A of the constitution enjoin the state to protect and improve the environment and to safe guard forests and wildlife. “ It shall be the duty of every citizen to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures” – this is being stated in Article 51A of Constitution containing fundamental duties. The Magna Carta of Indian law enforcement is the Wildlife (*Protection*) Act (WPA), 1972. It provides the protection of wild animals, birds and plants and for related matters with a view to ensuring the ecological and environmental security of the country. It prohibits trade or commerce in trophies, animal articles, etc. derived from animals listed in the four schedules and prescribes punishment for such offences. Foreign Trade (Development and Regulation) Act, 1992 lists the prohibited and restricted items. The export and import policy is framed under this act. Customs Act, 1962 describes about all punishable offences against CITES and Export-Import policy. CITES, the Convention on the International Trade in Endangered Species of wild fauna and flora (the Washington Convention) was signed in 1973 providing a mechanism to regulate the trade in wildlife. Under its guidance, governments all over the world have taken steps to prevent this illegal trade and bring it under control. Other

laws like The Indian Penal Code, 1860; The Code of Criminal Procedure, 1974; The Prevention of Cruelty to Animals Act, 1960 and The Arms Act, 1959 also regulate the wildlife trade. International movement of wildlife and wildlife products is regulated under Part 13A of the Environment Protection and Biodiversity Conservation Act 1999 for all wildlife except cetaceans. These laws should act as a deterrent to those involved in the illegal wildlife trade.

It is the necessity of the world to conserve the forest and the related wildlife for the existence of biodiversity. Mahatma Gandhi says, “The greatness of a nation and its moral progress can be judged by the way its animals are treated.”

# Chapter 6

## DISCUSSION

Entire organisms and their body products like flesh, bones, teeth, bone marrow, fat, shells, musk, secretions, testicles, as well as their products like milk, curd, butter, ghee, honey and even the metabolic products like urine and excreta (dung) are used in traditional medicine. They are used either alone or in combination with other herbs and minerals. Among the domesticated animals the products of cow, buffalo, goat, sheep and pigs are mostly used, while among the wild animals the products of tiger, panther, leopard, monkey, mongoose, fox, hare, deer, sambar, porcupine and wild boar are used.

Tribals use a wide variety of animal products in their medicament. Some species of mammals have been proved as a vital source of tribal medicine. More than thirtyfive diseases, such as tuberculosis, rheumatic and joint pains, asthma, piles, night blindness, paralysis, debility, impotency, etc. are cured with the help of animal drugs. Fats derived from different animals have been proved to be most effective and useful medicines for rheumatic and muscle pain, paralysis, impotency, skin burns and rickets. The fat of wild boar and tiger has got greater importance. The use of bear bile for high fever seems to be very common in tribal medicine. Flesh of different animals is used in tuberculosis and general weakness. Tribals also use human urine to cure some kinds of infections. There appears to be scientific reason for this. The urine of a healthy non-pathological man contains urea, uric acid, creatine, creatinine, xanthine, etc, which have potentially active antiseptic action.

More than fortyfive animal products used in tribal medicine have been identified so far for further scientific investigations. Fat derived from more than 13 animals especially wild animals, seems to be very effective medicine in curing all sorts of pain including rheumatic pains. Fat is also used externally as a remedy for pain, impotency, skin burn and paralysis. Many of the animal drugs used by tribals are worth of further scrutiny. So the documentation and conservation of these animal taxa is significant in the current era of documenting medicinal importance of animals to provide an update on indigenous know how. Hence a medicinal or nutritive quality of all the animal species becomes the need of hour. The use of animals for medicinal purposes is part of traditional knowledge, which is increasingly becoming more relevant to discussions on conservation biology, public health policies, and sustainable management of natural resources, biological prospection, and patents.

During the last half century, ethnobiology has emerged as a valid discipline that can play a very prominent role in the advancement of many aspects of scientific, sociological and historical studies. An increasing number of investigations have been done to the vast store of knowledge of plant properties and uses, still intact in native cultures in several parts of the world and comparatively less concentration on ethnozoological studies. The Indian sub continent represents one of the greatest emporia of ethnobiogical wealth and Western Ghats represents the second hot spot in India. In Kerala, many living groups of tribals of about 3 lakhs, still more or less isolated from the influence of modern world, and who continue to use various wild and domesticated animals and plants for food, drugs, customs, game, religious purposes etc. They hunted

the animals for bare necessity without tilting the balance of the ecosystem, provided their dietary system with needed nutritive value for the sustenance of life. More than 100 animals including birds have so far been proved as quite useful source of food to the tribals in different areas of the country depending upon their availability.

It is generally observed that the tribals are hardly selective in their animal food except to those animals related to religious belief, folk lore and myths and this varies widely from one community to another. On the other hand, some of the common animals like wild boar, chital, sambar deer, cow, monkey, tortoise, frog, crab, prawn, insects, molluscs etc. are by or at the best of non-tribals are in great demand. The tribal communities of our country generally use wide varieties of medicines derived from both invertebrate and vertebrate animals. As regards to use of animals as drugs, there are remarkably similar practices among the tribals depending on the availability of specific animals around their habitats. This indicates indirectly the authenticity of usage of such drugs that evolved through ages in the health care systems of the tribals. About one hundred and seven species of animals have known to be the vital source of tribal medicine. Of these, sixteen species are invertebrates like insects, crustaceans, arachnids, mollusks, etc. and sixty are vertebrates, which include six species of Pisces, five species of Amphibia, five species of Reptiles, sixteen species of Aves and twenty nine species of Mammals, etc. The invertebrates are generally used as a whole, while in case of vertebrates, the body parts, tissues, exoskeletons, flesh, blood, bile, fat, bones, gastrointestinal tracts etc. are used. Likewise animal products such as honey, egg, milk, spider net, urine and faeces are of vital value in curing many diseases. The diseases

known to be cured with the help of animal drugs are too many such as tuberculosis, rheumatic and joint pains, asthma, piles, pneumonia, night blindness, impotency, paralysis, weakness, cholera, body ache, etc. How ever, the overall development in recent times in the country is bringing rapid change in their disease treatment through modern medicine. Different body parts of various animals are widely used by tribals for a variety of domestic purposes. Dry shell of *Unio* for scrapping, hairs of bear and horse for making rope, brush, coral for musical instruments, teeth of elephant for making bangle etc. On this background collection of information of the species of animals utilized by tribal groups, method of utilization, sustainability of methods is important for the formulation of a strategy and action plan for the conservation and utilization of animal resources in a sustainable manner.

This report is aims to fulfill the scientific lacunae in these aspects, documenting various ethnozoological remedies and various end uses and scientific evaluation leading to patenting of products and formulations thereby conserving wildlife resources and sustainable utilizations in Western Ghats, South India in general.

# Chapter 7

## RECOMMENDATIONS AND SUGGESTIONS

- Informations among the tribals regarding traditional medicines are declining and the main informants are aged ladies.
- There is a prominent decrease in the male population of primitive tribal groups like Cholanaikans, Kattunaikans and Aranadans (total number being 74 only) due to addiction to alcoholism, chewing and smoking losing structural family system and being target groups of family planning.
- Most of the animals used in the study used by tribals fall in the category of endangered species.
- The methods of collection used by the tribals are not sustainable. This has to be rectified by scientific awareness programmes.
- Collection and marketing system are quite unscientific and value addition to the products like honey and honeybees will fetch enhanced income.
- Small-scale enterprises for value addition to NWFPs should be established for enhanced income generation and employment.
- Wildlife trade is highly prevalent in all states in India and the animal parts used include skin, antlers, and bones; also fishes, tortoises, even live butterflies, moths in Nilambur and tiger spider of Parambikulam areas.
- Joint forest management paricipating tribals in conservation programmes and awareness camps are to be conducted among tribal settlements.

- Scientific sustainable mangement of forest resources have to be done so as to reach the grass root level among tribals.
- Provisions for wildlife farming and sustainable utilization are recommended.
- The holistic approach of wildlife conservation and management incorporating area specific and species-specific studies, monitoring and evaluation of problems of wildlife management studies, disease vigilance studies are to be conducted.
- The scenario of plant-insect-wildlife interactions is to be studied incorporating the services of Forest Departments of various States and Veterinary Colleges.
- Human interference based on an ecological principle is to be considered important while dealing with rare and endangered species and representativeness; educational values, political values and aesthetic values are to be considered.
- Domestication and consumption of smaller wildlife species which grow faster (*truly renewable*) and that can be reared easily for meat production has to be promoted for the sustainable mode of wildlife management. These animals include edible mammals, amphibians, reptiles, fishes and birds that constitute the micro-livestock of the future.
- Commercial export of regulated wildlife and wildlife products has to occur only where the specimens have been derived from an approved source (captive breeding program, artificial propagation program, aquaculture program, wildlife trade management operation, or wildlife management plan). The import of CITES listed specimens for commercial purposes must be from an approved commercial import

program or approved captive source and is subject to specific conditions (303CH) related to the particular appendix on which the specimen is listed.

- Governments should recognize that indegenous lands need to be protected from environmentally unsound activities.
- Culling of animals like wild boar will automatically reduce the human-wildlife conflicts to a certain extent which will automatically change the attitutde of forest dwellers towards wildlife protection.
- Wildlife farming of selected animals on selected forest areas and sustainable utilisation of animals will automatically reduce the pressure on wildlife in forests.
- Biological prioritisation and patenting of Ethnomedical properties are to be undertaken.

# Chapter 8

## SUMMARY

Anthropological approach to Zoolozy is ethnozoology which deals with the study of interrelationship with primitive human societies and the animal resources around them**.** Ethnozoological studies from the tribal groups of both the districts of Malappuram and Palakkad have obtained many revelations. During the period six tribes including Aranadan, Kuruman, Katttunaikan, Paniyan, Cholanaikan and Muthuvan have been documented from Malappuram district and 32.18% of tribes have been surveyed in detail. Ten tribes from Palakkad district including Irular, Malasar, Mudugar, Kattunaikar, Paniyan, Kadar, Kurumbar, Eravalan, Malayarayan and Malamalassar were documented from Palakkad district and 34.35% of tribal groups have been surveyed in detail.

One hundred and seven organisms have been found to be used by the tribals in ethnomedicine including ten species of insects, two annelids, one mollusc, one arthropod, two arachnids, nine fishes, five reptiles, five amphibians, twenty eight birds and forty four mammal species has been found to be used by the tribals to treat more than thirty two diseases. The organisms are used either as a whole or parts of the body. The body parts used include tissues, exoskeletons, flesh, blood, fat, bones, gastrointestinal tracts, etc. The wild animals besides its uses for food, medicine and in the trade of parts or the whole animal are also used for non-edible purposes like ornaments, clothing, tools and in religious functions also. These associations are to be evaluated in terms of the cultural, aesthetic, medicinal, economic and on social values.

The tribals use various methods for killing/capturing animals and most of them are non-sustainable. They include pit poaching, poisoning, arrowing, trap and snare, stick and glue, net, harpooning, etc. The methods of fishing used by tribal people include both destructive and non-destructive methods. There appears to be growing trend of depletion of biodiversity as well as cultural diversity of the tribes. Possibilities and practices for captive breeding by the integration of traditional and modern methods may be explored and appropriate policy/s may be formulated for the conservation of animal biodiversity and cultural heritage of tribals of Western Ghats. Scientific investigations to testify the efficacy of some of the crude drugs derived from animal source/s from ethnic groups may be undertaken and large-scale sustainable product development is recommended. Their use is relevant to discussions on conservation biology, public health policies, sustainable management of natural resources, biological prospection and patents.

## Chapter 9

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