



# Ethno-medico-botanical studies of Eruliga and Lambani tribes of Kanakapura taluk of Ramanagara district of Karnataka

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Received: 9 May 2022 / Accepted: 2 July 2022 / Published online: 18 August 2022  
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## Abstract

A study was carried out on the ethno-medico-botanical knowledge of Eruliga and Lambani tribal communities including the native Vaidyas of other communities in Kanakapura taluk of Ramanagara district of Karnataka. The field survey and documentation of indigenous medicinal knowledge and medicinal plants was conducted from September 2019 to March 2022. A total of 417 formulations consisting of 217 medicinal plants practiced by 140 traditional practitioners were documented. The study is a positive step towards documenting the traditional medicinal knowledge, which is on the verge of extinction in future. It will help the scientific community to uphold the ancient medicinal knowledge for the betterment of society.

**Keywords** Indigenous medicinal knowledge · Kanakapura · Medicinal plants · Tribal communities

## 1 Introduction

The project aims to document the indigenous knowledge of the Lambani and Eruliga tribal communities and highlight their traditional medical practices by using local botanicals. In this process, it endeavours to preserve their knowledge and conserve existing medicinal plants for sustainable utilization for future generations. This will help safeguard the valuable indigenous knowledge concerning natural medicinal plants and provide a baseline for future action regarding scientific research. The objectives of the project are: (i) documentation of the traditional knowledge of the two tribal communities, (ii) identification and authentication of medicinal plants, (iii) preparation and documentation of herbarium, and (iv) identification of endangered taxa.

India is country with rich biodiversity, endowed with a number of medicinal plants with ancient traditional knowledge about their herbal usage. Indians have their own traditions from ancient times to utilize these natural sources in a sustainable way and pass this from one generation to

another. The plants have been an important source of food, clothing and medicine from ancient time and have continued playing a very significant role in health care system. The tribal communities of India have vast knowledge in utilizing the bio resources. In the present day, due to modernization of society, this valuable knowledge has started declining. This ethno-medico-botanical study is based on the secondary metabolites or active principles found in both plants and animals and practiced by different tribal or ethnic groups who have very little access to the allopathic medicine. A number of plants have been used as a medicine traditionally based on the knowledge inherited from one generation to another (Mohan and Deepa, 2021). The medicinal plants are natural gift to human beings to help them lead a disease free healthy life. The systemic standardization of ethno-medical herbal formulations into modern phyto-pharmaceutical has enhanced the chances of increased efficacy and safety profile of traditional medicine (Bhattacharya and Achintya, 2013). WHO estimates that about 80% of the world's population relies on herbal medicine, a major component in all traditional medicines for some aspect of primary health care. It defines traditional medicine as a major component in all the health practice approaches, knowledge and beliefs incorporating the plants, animals and mineral based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to treat and prevent illness or maintain wellbeing. A scientific attempt was made at Kanakapura Taluk of Ramanagara district of Karnataka

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The project was accomplished under the sponsorship of Indian National Commission for History of Science during the period September, 2019 to March, 2022.

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where the Lambani and Eruliga tribal communities lived. The ethno-medico-botanical study was conducted and the medicinal plants and herbal formulations were documented. The medicinal plants were used to treat various diseases as a curative and preventive measure. They were used not only to treat human being but also to treat their domestic animals and to ward off evil spirits. The formulations of herbal preparations are also unique from one practitioner to another and one place to another. This ancient knowledge is the source of discovery of novel drug to serve the society and the scientific community. Now a days this traditional valuable knowledge has started declining due to modernization of society, lack of interest and negligence by the younger generation of the tribal communities and local vaidyas due to influence of modern system of medicine. This study was conducted to document the valuable information for sustainable utility after scientific validation.

## 2 Materials and methods

Periodic survey was conducted in different part of the study area. The purpose of the study was explained to the tribal communities and practitioners. They were not pressurized to disclose their valuable knowledge and ensured that the information gathered will be used exclusively for documentation purpose. The information was collected in the local language. The questionnaire involved consent of the informant for sharing their ethno-medico-botanical knowledge. The elderly persons among the tribal, priest, women and native vaidyas were interviewed in their native places and they were taken to the field for documentation of medicinal plants. A standard preform was used to document the details in the survey.

The plant specimens were collected from the field and details were documented, photographed and authenticated by referring to the floras. A herbarium was prepared by giving voucher number and arranged according the Bentham and Hooker system of classification. Work was conducted under following four headings.

### 2.1 Field survey

The field survey was conducted from September 2019 to March 2022 in the villages and hamlets of Kanakapura taluk of Ramanagara district where these tribal communities are inhabited. The information was collected about indigenous knowledge of medicinal plants used to treat various diseases or disorders from the informants through interviews with questionnaire as suggested by Dr. S. L. Kapoor and Dr. Rama Mitra. Depending on the convenience of the healers, guided field work method was followed (Martin, 1995). A walk through the field with healers allowed both the confirmation of medicinal plants used for the treatment and to

gather detailed information. Data was recorded by personal interviews. The questionnaire was designed to obtain the socio-demographic information of traditional healers, such as name, gender, age and their knowledge about the plants they were using to treat various ailments. The vernacular names and parts of the plants ingredients used as an additive for the drug formulations were also recorded. Each informant was interviewed more than twice to confirm the reliability of the ethno botanical information. If the response of an informant was not consistent with the previous one, the information was rejected. Such responses were considered unreliable and only the relevant one were taken into account and considered for further statistical analysis.

### 2.2 Specimen collection, identification and authentication of taxa

The collected plant samples were initially identified by their vernacular names with the help of healer and other local people. The collected plant specimens were tagged in the field itself. The morphological features were entered in the field note book. The collected specimen was scientifically identified and authenticated with the help of local and regional flora. The flora of Bangalore district (Ramaswamy and Razi, 1973), flora of Shimoga district (Ramaswamy et al., 2001), flora of Hassan district (Saldana, 1976), flora of Karnataka (Saldana, 1982, 1996), flora of Gulburga district (Seetharam et al., 2000) and Flora of the Presidency of Madras (Gamble, 1967) were referred. The herbarium was prepared and authenticated by Dr. Sreenath, K.P. former professor and Plant Taxonomist, Department of Botany, Bangalore University, Bangalore and deposited in Aapyam Institute of Indigenous Sciences and Research, Bangalore. The botanical specimens were enumerated alphabetically according to their scientific name and classified and documented on the basis of class, family, habitat, parts used and usage.

### 2.3 Documentation of traditional usage

The formulations of herbal medicine used to treat various ailments were documented with modern medical terminologies in addition to the common terms. The herbal formulations used to treat human beings, domestic animals and to ward off evil spirit were classified. The herbal ingredients and additives used for each formulation were documented. The statistical analysis was done and documented in tables and graphs.

## 3 Results

It was found that out of the total number of 217 of angiosperm medicinal plants which were used to prepare the herbal formulations, 21 are monocot and 196 are dicots,



belonging to the 75 families. The largest representation being of the *Fabaceae* 7.37%, succeeded by *Euphorbiaceae* 5.06%, and *Asclepiadaceae* & *Verbinaceae* both having a share of 4.14% each. The parts of the plants used to prepare formulations vary from one formulation to another, highest being for leaves about 41.47%, second highest for stem about 20.27%, succeeded by roots 18.89% and fruit 12.44%.

A total of 417 formulations are used to treat different ailments of human beings, domestic animals and to ward off evil spirits by the 140 numbers of traditional practitioners between the age groups of 40–90 years. 35% of information gathered was from the age group between 61 and 70 years and second highest from the age group between 51 and 60 years. The herbal formulations contain single medicinal plants as an ingredient with or without additives for treating ailments. Some preparations contain multidrug ingredients with or without adjuvants. The additives vary from one formulation to another. These additives are honey, goat milk, native cow butter, butter milk, cow urine, saliva, children's urine, hen's egg. Some formulations contain mineral sources as an additive such as lime (Calcium carbonate) and ochre (Earthy pigment containing ferric oxide-red colour). 190 preparations were found to be single drug formulation, 222 multi drug and 5 non-herbal.

Single drug formulations are used in case of leucorrhoea in which tuberous roots of *Asparagus racemosus* are pounded to extract fresh juice of about 100 ml and mixed with 2 tea spoon of sugar and administered internally for 20 days. In this formulation, sugar is an additive. There is multi drug formulation to cure eczema made out of two medicinal plants viz. seeds of *Argemone maxicana* and rhizome powder of *Curcuma longa* by pounding together and macerating to get a fine paste and applied externally on skin.

There are some formulations to treat domestic animals, e.g. treating the retained placenta condition after delivery. The practitioner prepares a single drug formulation containing fresh leaves of *Azadirachta indica* in which fresh leaves are macerated to get a fine paste using luke-warm water. This paste is applied around the vagina and covered with cotton cloth dipped in cold water to expel retained placenta of a cow. For treating fever in domestic animals, practitioners prepare multidrug formulation in which fresh leaves of *Cannabis sativa* of about 10 gms and 10 numbers of fresh leaves of *Piper betle* are pounded together to make a paste. It is mixed with two numbers of hen's eggs and the mixture is administered internally for 2 days.

The herbal formulations are also used as an antidote in which an external dusting of filtered dried root powder of *Cardiospermum halicacabum* is used for scorpion sting. There are multi-drug formulations as well which are used as an antidote. In this formulation, coarse powder of dried roots of *Cassia fistula*, whole fresh biomass of *Ichnocarpus frutescences* and coarse powder of dried stem bark of *Tarenna*

*asiatica* in equal quantity are boiled with water to prepare a decoction in the ratio of 1:4. The decoction is reduced up to quarter and 20 ml of filtrate is administered orally as an antidote for snake bite. The tribal communities also used some herbs like *Aloe vera*, *Alangium salvifolium*, *Euphorbia tirucalli* and *Acorus calamus* to ward off evil spirits. There are non-herbal formulations as well to treat human being as well as domestic animals e.g. dried scrotum of civet cat is used to cure migraine, dried faeces of elephant is used to cure downer cow syndrome, snake shed's fumes are used as anti-microbial agent, extracted fat of monitor lizards is used for healing of fractured bone. Ash is used to expel the retained placenta in domestic animals.

#### 4 Discussion

Plants are the source of raw materials for the traditional, tribal and folk medicines. These systems of medicinal practices are still known to be an important part of everyday life in many regions of the world (Bussmann & Sharon, 2006). The practices of tribal medicine have never been properly standardized, as there are diversities in their preparation and their use in the different groups of tribal communities in same area. The investigations carried out in this study highlights the ethno-medico-botanical uses of 417 formulations of herbo-mineral and animal origins. *Phyllanthus amarus* and *Piper nigrum* were the most widely used plants. *Phyllanthus amarus* is used as a main herbal formulation in 18 preparations. Its fifteen formulations in the form of juice, paste and decoction with goat milk, cow milk, butter milk and tender coconut water as an additive are used for treating jaundice. *Trianthema portulechastrum* and *Astrochantha longifolia* are used as an ingredients in two formulations as a multi-drug preparation for treating jaundice. One formulation is used to treat infertility with banana fruit as an additive and other one for treating fever where a decoction is used with sugar as an additive and one more as an appetizer with cow milk as an additive. The pharmacological effectiveness of *Phyllanthus amarus* has been scientifically proven as an antiviral herb by many researcher and it is also used as a treatment for jaundice in Ayurvedic literature. The fruit of *Piper nigrum* also is used in eighteen formulations, but it is used in multi-drug formulations but not as a main herb. The therapeutic effect of this plant is also scientifically proved and found in many literatures and in research articles. The formulations are used to treat tooth ache, stomach ache, fever, appetizer, eczema, diarrhoea, cold, cough, downer cow syndrome and gastro intestinal disorder in domestic animals. *Phyllanthus amarus* and *Piper nigrum* plants have highest frequency or utility value of 4.31%, followed by *Allium sativum* and *Azadirachta indica* 3.59%, *Saccharum officinarum* 3.11%, *Cocos nucifera* 2.87%,



*Asparagus racemosus* and *Piper longum* 2.15% and *Curcuma longa*, *Piper betle* and *Ricinus communis* 1.91%. Bulb of *Allium sativum*, juice and extracts in the form of jaggary and crystals of *Saccharum officinarum*, tender water or oil of *Cocos nucifera* are used as secondary or additives in the formulations.

The quantity of plants part used as raw drugs, number of leaves, seeds and length of a root, stem and thickness of bark for preparing formulations are not specified in units. The units of measurements used to determine dosage were: a handful, cup, finger length, drops, and teaspoon and additives like honey, butter milk, butter, baby urine, cow urine, lime. Thus accuracy of dose determination and unit measurement of the medicinal plants were the problem and drawback of the tribal practitioners. However, their therapeutic effect cannot be questioned because these formulations are inherited by their forefathers and have continued from one generation to the next.

During the study, it was noticed that out of 217 documented plants 11 species are in the rare, endangered and threatened list. These plants are *Aegle marmelos*, *Boswellia serrate*, *Butea monosperma*, *Celastrus paniculatus*, *Cissampelos peraira*, *Decalepis hamiltonii*, *Gloriosa superba*, *Gmelina arborea*, *Leptadenia reticulate*, *Pterocarpus santalinus* and *Santalum album*. Though the tribal practitioners used above plants in their formulations, they were not aware about the status of these plant in the biodiversity. The animal based formulations include the dried scrotum of civet cats for treatment of migraine, extracted fat of monitor lizards for healing of fractured bone. The narcotic plant *Cannabis sativa* and endangered plants *Pterocarpus santalinus* and *Santalum album* are declining due to strict implementation of wild life and forest act.

## 5 Conclusion

The study re-looks into the indigenous knowledge and potency of traditional knowledge of local tribal communities and traditional practitioners in treating various ailments of human beings as well as their domestic animals. It is a positive step towards the documentation of herbal formulations, preparation and mode of administration for sustainable utilization of bio resources among the communities in

the future. The study highlights importance of conservation of local flora which is rare, endangered and threatened. It tries to increase awareness among the scientific community about the potential for novel drug discovery and formulations in the field of pharmacy for serving the society. There is an urgent need for scientific evaluation and standardization of these medicinal formulations and preparations for their effective application. The standardization of herbal medicine through pharmacognostic and pharmacology of documented plants is recommended as future research in this area. It will help the scientific community to uphold the ancient knowledge for the betterment of society locally and globally.

## References

- Bhattacharya, P., & Achintya, S. (2013). Evaluation of reversible contraceptive potential of *Cordia dichotoma* leaves extract. *Revista Brasileira De Farmacognosia Brazilian Journal of Pharmacognosy*, 23(2), 342–350.
- Bussmann, R. W., & Sharon, D. (2006). Traditional plant use in Northern Peru: Tracking two thousand years of health culture. *Journal of Ethnobiology and Ethnomedicine*. <https://doi.org/10.1186/1746-4269-2-47>
- Gamble, J. S. (1967). *The flora of the Presidency of Madras* (Vol. I–III). Botanical Survey of India.
- Martin, G. J. (1995). *Ethnobotany: A Conservation Manual*. Chapman and Hall.
- Mohan, A., & Deepa, M. S. (2021). A review on ethno botanical importance of an endemic species of Western Ghats: *Strychnos colubrina* Linn. Sp. (Vallikanjiram). *International Journal of Herbal Medicine*, 9(1), 19–22.
- Ramaswamy, S. V., & Razi, B. A. (1973). *Flora of Bangalore District*. Prasaranga.
- Ramaswamy, S. N., Radhakrishna Rao, M., & Govindappa, D. A. (2001). *Flora of Shimoga District*. University of Mysore.
- Saldana, C. J. (1976). *Flora of Hassan District*. Karnataka, Amerind Publishing Co.
- Saldana, C. J. (1982). *Flora of Karnataka vol I*. Oxford and IBH.
- Saldana, C. J. (1996). *Flora of Karnataka II*. Oxford and IBH.
- Seetharam, Y.N., Kottreshi K., Uplaomkar, S.B. (2000). *Flora of Gulburga District* (First edition). Gulburga University

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