

**ETHNOMEDICINAL PLANTS USED BY THE TRIBALS OF MUDUMALAI WILDLIFE
SANCTUARY FOR POISONOUS BITES**

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ABSTRACT

In the present study, ethnomedicinal surveys were undertaken among various tribes residing in the Mudumalai Wildlife Sanctuary (MWLS), Tamil Nadu and documented the indigenous knowledge on medicinal plants used by them for the treatment of various poisonous bites. Totally 24 plant species belonged to 21 genera and 20 families were used for various poisonous bites including snake bites by the tribes residing in of MWLS. All the documented information on ethnomedicinal plants against poisonous bites were given alphabetically with binomial, family, local name, herbarium specimen, habit, flowering & fruiting, uses, dosage of preparation, method of administration along with the recommended diet prescribed by them. This study would provide a firsthand resource material and very useful for the ethnopharmacologist to develop herbal based antidote drug(s).

Keywords: Ethnomedicine, Mudumalai Wildlife Sanctuary, tribes, poisonous bites

1. INTRODUCTION

Ethnomedicine refers to the study of traditional medical practice which is concerned with the cultural interpretation of health, diseases and illness and also addresses the healthcare seeking process and healing practices (Krippner, 2003). The practice of ethnomedicine is a complex multi-disciplinary system constituting the use of plants, spirituality and the natural environment and has been the source of healing for people for millennia (Lowe *et al.*, 2000). According to the World Health Organization (WHO, 2003) ethnomedicine has maintained its popularity in all regions of the developing world and its use is rapidly expanding in the industrialized countries (WHO, 2003), for example, in China traditional herbal preparation account for 30–50% of the total medicinal consumption. In Ghana, Mali, Nigeria and Zambia, the first line treatment for 60% of children with malaria is the use of herbal medicine. In San Francisco, London and South Africa, 70% of people living with HIV/AIDS use traditional medicine. Today the annual global market for herbal medicine stands at over US \$60 billion (WHO, 2003).

Western trained physicians could not ignore the impact of ethnomedicine on their patients. Research interest and activities in the area of ethnomedicine have increased tremendously in the last decade (Williams, 2006). Since the inception of the discipline, scientific research in ethnomedicine has made important contribution to the understanding of traditional subsistence, medical knowledge and practice.

It is interesting to note that the ethnomedicinal uses of plants is one of the most successful criteria used by the pharmaceutical industry in finding new therapeutic agents for the various fields of biomedicine (Cox and Balick, 1994). Some outstanding medicinal drugs which have been developed from the ethnomedicinal uses of plants include: vinblastine and vincristine from *Catharanthus roseus* (the periwinkle) used for treating acute lymphoma, acute leukaemias *etc.*, reserpine from *Rauwolfia serpentina* (Indian snake root) used for treating hypertension, aspirin from *Salix purpurea* (willow) used for treating inflammation, pain and thrombosis and quinine from *Cinchona pubescens* (cinchona) used for treating malaria. Based on the ethnomedicinal information, a total of 122 compounds were identified and 80% of these compounds were used for the same (or related) ethnomedical purposes (Fabricant and Farnsworth, 2001).

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Further, it was discovered that these compounds were derived from only 94 species of plants (Farnsworth and Soejarto, 1985). Hence it is very urgent to document the knowledge on several other plants from indigenous people, the treasurer of plant wealth. With this background the present study deals with the documentation of ethnomedicinal information on plants from the tribals of Mudumalai Wildlife Sanctuary and presented here with special reference to poisonous bites.

2. MATERIALS AND METHODS

Study Area

Mudumalai Wildlife Sanctuary (MWLS) comprises an area of 321 km², lying 11°32'-11°43' N latitude and 76°22'-76°45'E longitude on the northwestern side of Nilgiri hills. Its topography is extremely varied and comprises of hills, valleys, ravines, water resources and swamps. The Moyar River finds its way through this sanctuary, gifting it a number of awesome cascades. This sanctuary has five ranges, and in the year 2007, it was declared as Tiger Reserve.

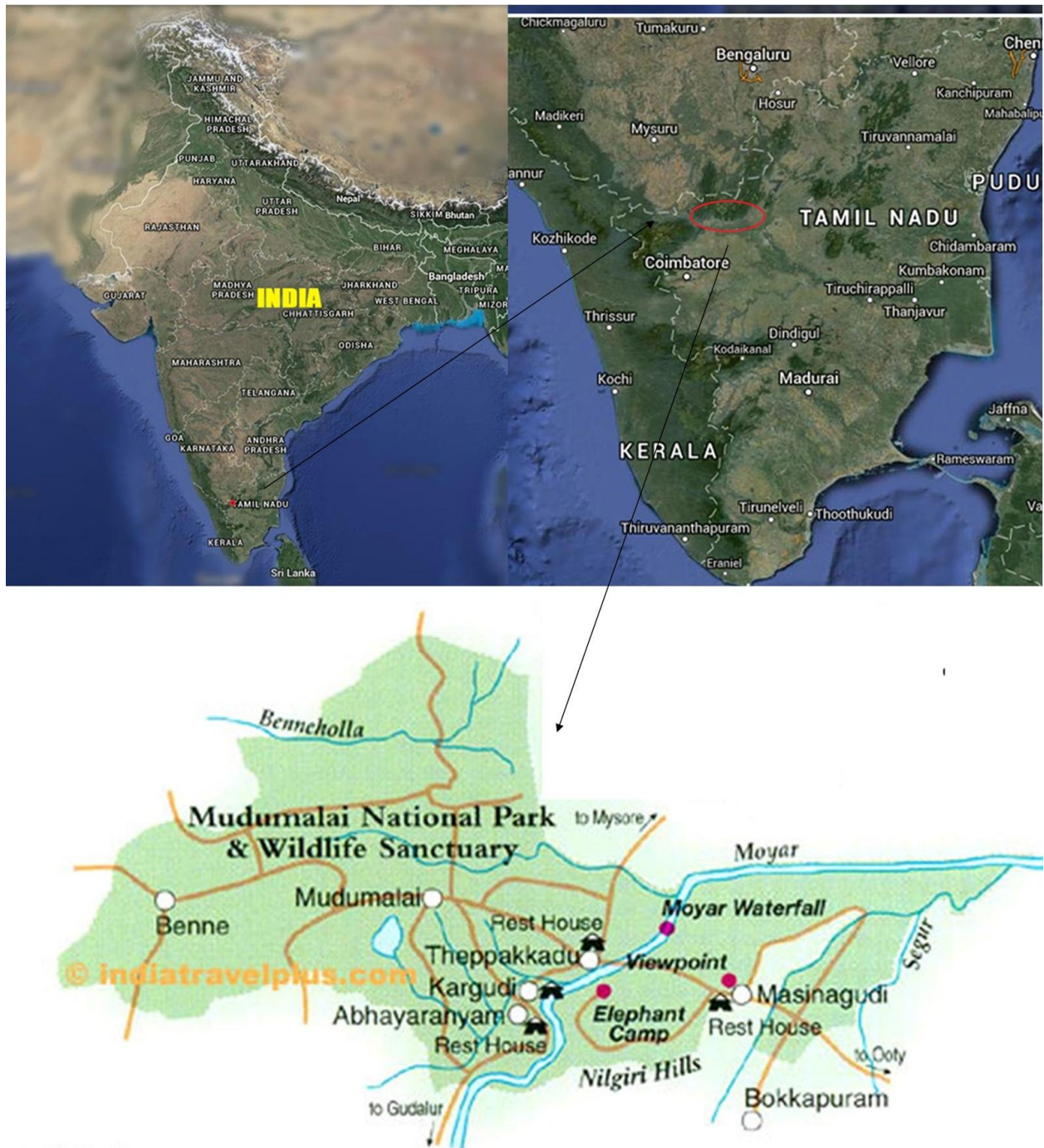


Fig 1. Map showing the Study area – Mudumalai Wildlife Sanctuary.

Tribal Settlements

There are 5 tiny tribal hamlets located within the sanctuary and the tribes living in these settlements include Mountain Chetties and tribes; Kattu Naickers, Paniyas and Kurumbas. Mountain Chetties main occupation is to perform agricultural practices in swamp vayal habitats and rear cattle. The Paniya tribes work in agriculture fields of Chetties and they also collect tuber, honey, and perform fishing operations in the reserve for their sustenance. There are also Kurumba, Kattu Naicker tribes and Paniyas living near Theppakadu, Kargudi and Thorapalli. The Kurumbas are basically huntergatherers. At present they do not hunt animals. Kurumba, Kattu Naickers and Paniyas collect tubers, honey, and mushroom and also scavenge on carnivore kills. These people work as fire watchers, tourist guide, mahout and anti-poaching watchers.

Ethnomedicinal Survey

Intensive field ethnomedicinal surveys were conducted in the Mudumalai Wildlife Sanctuary (MWLS) from 2011 to 2014 to document ethnomedicinal plants resources used by tribals of Kurumba, Kattu Naickers and Paniya tribals residing in MWLS settlements of Kargudi, Masinagudi, Nelakottai, Theppakadu and Mudumalai regions by following the methods of Jain (1981). The questionnaires were used to obtain information on medicinal plants with their local names, parts used as medicine, mode of preparation and dosage of administration. The species mentioned by the tribes were taxonomically identified. While gathering the information, herbarium specimens were prepared for all the plant species on ethnomedicinal plants available in the study area by following the methods of Jain and Rao (1976) and deposited at the Department of Botany, Mannai Rajagopalaswamy Government Arts College, Mannargudi, for reference. The herbarium specimens were botanically confirmed by using various regional Flora such as Gamble and Fischer (1915-1936), Hooker (1872-1897), Matthew (1981-1988) while the Flora of Tamil Nadu by Henry *et al.*, (1987 & 1989) and Nair and Henry (1983) were used to refer the correct botanical names.

3. RESULTS

All the documented information on ethnomedicinal plants for poisonous bites used by various tribes (given in brackets) from MWLS were given below alphabetically with binomial, family, local name, herbarium specimen, habit, flowering & fruiting, uses, dosage of preparation, method of administration and recommended diet if any —

Achyranthes aspera L., (Amaranthaceae), 'Naayurivi' (J & K 219)

Herb. Throughout the year

Prepare root paste with one handful of root and consume 2-3 g root paste along with milk immediately after any poisonous insect bites or dog bite. Oil/spicy/fish food should be avoided during the treatment (*Paniyas*).

Alangium salvifolium (L.f.) Wang, (Alangiaceae), 'Azhinjil' (J & K 88)

Tree. February-June

Consume leaf paste made from one handful of leaves orally as an antidote for insect bites (*Kattu Naickers*).

Andrographis paniculata (Burm.f.) Wall.ex Nees., (Acanthaceae), 'Nilavembu Siriyangai' (J & K 125)

Herb. September to January

Prepare a paste with one handful of leaves along with 3 peppers and water sap of *Vaazhai* stem (Banana, *Musa paradisiaca*, Musaceae) and consume thrice a day for scorpion bite (*Kurumba*).

Prepare leaf paste with one handful of leaves along with 2-5 g *Dioscorea oppositifolia* rhizome and consume thrice a day for snake bite till it gets cured. During the treatment, oil/spice/fishes, egg should be avoided (*Paniyas*).

Arisaema leschenaultii Blume, (Araceae), 'Kollankovai' (J & K 172)

Herb. September to January

Prepare a paste with fresh tuber (5-10 g) and consume immediately along with milk thrice a day for snake bites. If milk is not available, preferably urine can be used as substitute i.e. female urine for male patient and male urine preferably male child urine for female patient can be used (*Kurumba*).

Aristolochia indica L. (Aristolochiaceae), 'Ishwaramooli' (J & K 2)

Herb. September to January

Consume 2 g of root paste immediately for quick relief of snake and other poisonous bites till cured (*Kurumba*).

Asclepias curassavica L., (Asclepiadaceae), 'Seemaierukku' (J & K 149)

Herb. Throughout the year

Apply leaf paste mixed with calcium carbonate salt, *chunnambu* at the bite site as an antidote against poisonous insect bites (*Kurumba*).

Bambusa arundinacea (Retz.)Roxb.

(Poaceae), 'Mulmoongil' (J & K 67)

Tree. September to February

Consume fresh young leaves for poisonous insect bites. The treatment may be stopped after sensing the spicy taste of pepper (*Kattu Naickers*).

Cassia italica (Mill.) Lam. ex Andr., (Caesalpinaceae), 'Nilavarai' (J & K 182)

Herb. September to February

Consume fresh roots immediately for poisonous insect bite (*Kurumba*).

Cleistanthus collinus (Roxb.) Benth. ex Hook. f., (Euphorbiaceae), 'Ottanthazhai' (J & K 194)

Tree. January to August

Consume orally the fresh leaf juice mixed with the watery sap of *vazhaimaram* (*Musa paradisiaca*, Musaceae) and take orally for scorpion bite (*Kattu Naickers*).

Corallocarpus epigeus (Rottl. & Willd.) Clarke, (Cucurbitaceae), 'Karudankizhanghu' (J & K 71)

Climbing herb. September to March

Take 10-20g of fresh tuber made into paste along with watery sap of banana stem (*Musa paradisiaca*, Musaceae) and consume immediately for the treatment of the snake bite (*Kattu Naickers*).

Dendrophthoe falcata (L.F.) Etting,

(Loranthaceae), 'Pulluruvi' (J & K 46)

Tree. February to May

One handful of leaves made into a paste along with watery sap of banana and take immediately after snake bite till it

cures. Diet food with no salt, tamarind was recommended. Egg and fish should be strictly avoided (*Kurumba*).

Enicostemma axillare (Lam.) Raynal, (Gentianaceae), '*Vellarugu*' (J & K 42)
Herb. September to February
Prepare paste of one handful of leaves, boil with water and consume for snake or any other poisonous bites till cures (*Kattu Naickers*).

Evolvulus alsinoides (L.) L., (Convolvulaceae), *Elikaathukeerai*, '*Vishnukiranthi*' (J & K 155)
Herb. Throughout the year
Apply the leaf paste externally at the bite site for poisonous bite sting such as insects, scorpions, bugs, spider etc (*Kurumba*).

Ichnocarpus frutescens (L.) R.Br., (Apocynaceae), '*Paalaikodi*' (J & K 23)
Climbing Herb. September to February
Apply both the leaf and root paste externally on the bite site immediately for any snakebite (*Paniyas*).

Leucas apera (Willd.) Link, (Lamiaceae), '*Thumbai*' (J & K 105)
Herb. Throughout the year
Apply the root paste externally at bite site for curing scorpion bite (*Kattu Naickers*).

Musa paradisiaca L., (Musaceae), '*Vaazhai*' (J & K 208)
Tree. Throughout the year
Consume the watery sap collected from the stem immediately for snake bite (*Kattu Naickers*).

Piper nigrum L., (Piperaceae), '*Nalla milagu*' (J & K 148)
Herb. September to March
Apply the leaf paste on bite site immediately and tie it firmly as bandage for scorpion bite to relieve pain and any other insect bites (*Kattu Naickers*).

Plumbago zeylanica L., (Plumbaginaceae), '*Chittramoolum*' (J & K 173)
Herb. September to March
Apply the root paste at the bite site tied tightly to relieve scorpion sting pain immediately (*Paniyas*).

Pongamia pinnata (L.) Pierre, (Fabaceae), '*Punghan*' (J & K 186)
Tree. February to August
Apply the root bark paste tightly as a bandage on the bite site for any poisonous bites (*Kurumba*).

Rauvolfia serpentina (L.) Benth. ex Kurz, (Apocynaceae), '*Sarppakandhi*' (J & K 16)
Herb. September to March
Consume root paste mixed with watery sap of banana stem orally for snake bite and other poisonous bites (*Paniyas*).

Rauvolfia tetraphylla L., (Apocynaceae), '*Paambukala*' (J & K 39)
Shrub. September to April
Boil 2 g of root bark powder along with water and consume the filtered decoction immediately for the treatment of snake and other poisonous bites till it cures (*Kurumba*).

Ruta chalepensis L., (Rutaceae), '*Arubhadhaam pachilai*' (J & K 31)
Shrub. Throughout the year
Prepare leaf paste with one handful of leaves and administer immediately for snake bite or any other poisonous bites. If the patient feels spicy taste of pepper, it shows the patient was normal otherwise the treatment will be extended furthermore. Only liquid food should be taken during the treatment (*Kattu Naickers*).

Strychnos potatorum L.f., (Loganiaceae), '*Thaeththaankottai*' (J & K 152)
Tree. February to June
Apply the leaf paste externally on the bite site to poisonous insect bites (*Paniyas*).

Apply the fruit paste on the bite site to cure poisonous bites of insects (*Kurumba*).

Strychnos nux-vomica L., (Loganiaceae), '*Etti*' (J & K 158)
Tree. February to June
Prepare leaf paste with one handful of leaves and consume along with milk for any poisonous bites. Fish/egg/oily food should not be taken during the treatment (*Paniyas*).

Totally 24 plant species belonged to 21 genera and 20 families were used for various poisonous bites by the tribes of MWLS, Tamil Nadu. Among these, *Paniyas* used 7 species, *Kattu Naickers* by 9 species, *Kurumba* by 10 species for poisonous bites.

4. DISCUSSION

Herbal remedies are considered as the oldest forms of health care known to mankind on this earth. Prior to the development of modern medicine, the traditional systems of medicine that have evolved over the centuries within various communities are still maintained as a great traditional knowledge base in herbal medicines (Mukherjee and Wahil, 2006). In the present study, 11 plant species were used for snake bites *Andrographis paniculata*, *Arisaema leschenaultii*, *Aristolochia indica*, *Corallocarpus epigeus*, *Dendrophthoe falcata*, *Enicostemma axillare*, *Ichnocarpus frutescens*, *Musa paradisiaca*, *Rauvolfia serpentina*, *Rauvolfia tetraphylla* and *Ruta chalepensis*. Similar results were also documented from tribes of various states in India (Makhija and Khamar, 2010; Basha and Sudarsanam, 2012; Uhakumari et al. 2012; Alagesaboopathi, 2013; Naturu et al, 2013; Thirunarayanan, 2013) . Moreover, Goswami et al., (2014) reviewed several important Indian medicinal plants used for snake bites and mentioned that in *Andrographis paniculata* the presence of andrographolide, the active diterpene is responsible for anti-snake venom property by modifying the actions of proteins and enzymes also inhibit snake venom phospholipase A2 activities in *Naja naja* venom. Traditionally, this treasure of knowledge has been passed on orally from generation to generation without any written document (Perumal Samy and Ignacimuthu, 2000) and is still retained by various indigenous groups around the world. In the present study, tribes utilizing different parts of plants in the form of paste, powder, juice, decoction, etc. The present study brought to light the immense hidden knowledge of Tribal people on any poisonous bites including insects, scorpion, snakes etc. Based on the present study and field experiences it is suggested that the detailed scientific experiments are urgently needed to evaluate the efficacy of these antidotes to develop a drug(s).

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