World Journal of Pharmaceutical Sciences
ISSN (Print): 2321-3310; ISSN (Online): 2321-3086
Published by Atom and Cell Publishers
Available online at: http://www.wjpsonline.org/
Original Article

Medicinal plant based antidote against snake bite by Irula tribes of Tamil Nadu, India

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Received: 11-08-2014 / Revised: 21-08-2014 / Accepted: 24-08-2014

ABSTRACT

Objective of the present study is to gather first hand information about anti-snake bite plants used by Irula tribes of Tamil Nadu. From 2011 to 2012, different tribal villages were visited. The herbal practitioners in this study area were interviewed and information on meditational plants was collected from the traditional healers called 'Vaidyars'. 30 informants were interviewed regarding the anti-snake bite plants used by them. Specifically 'Vaidyars' were interviewed to get an authentic antidote preparation of plants. This survey revealed a total of 30 anti-snake bite plants belonging 27 genera and 21 families. In terms of the number of plant species. Asclepidaceae and Acanthaceae constitute 34% of plants. Regarding the plant part used as antidote, the whole plant is used in 9 out of 30 species. The plants used against snake bite treatment by Irula tribe possess some chemical compounds responsible for snake venom inhibition. This traditional knowledge has to be protected and further chemical and pharmacological investigation may lead to the discovery of novel antidotes against snake bite.

Key words: Antidote, Ethnobotany, Irula tribe, Medicinal plants, Snake bite, Traditional knowledge

INTRODUCTION

The ethnic people live in harmony with nature have evolved a unique system of unwritten medicinal practice to cure various ailments by using medicinal plants [1]. This type of safe, environment friendly and sustainable ethnomedicine is widely practiced from ancient period by all the tribal communities throughout the world [2,3]. But with the advent of modern technology and transformation of tribal culture, this traditional practice has been gradually disappearing [4]. The Irula constitute a small tribal community live in different parts of India. Their main occupation is snake and rat catching, and they fully depend on forest produces and wild animals. They have rich knowledge about medicinal plants and its uses against various ailments [5]. Snake bite is a common acute medicinal emergency faced by rural people throughout the world; therefore people need adequate safety measures to counter these types of emergencies [6]. Since it leads to high mortality and great suffering in victims, the remedies are of great importance. Most of the tribal remedies are a combination of medicinal plants and secret magic words for invocation of deity [7].

Several scientific studies are in progress using modern scientific tools based on the lead from the folklore and ethnomedicine for formulating new western medicine [8]. Plant based traditional knowledge has been a recognized tool in the search for new sources of drug and nutraceuticals[9]. General ethnobotanical practices of Irula in other districts of Tamil Nadu such as Erode[5], Coimbatore[10] and Nilgiri[8] were documented. But so far no ethnomedicinal study has been conducted specifically on snake bite in Tamil Nadu. Hence the present study was undertaken to document anti snake bite practices of Irula tribes in Tamil Nadu.

MATERIALS AND METHODS

This study was conducted during 2011-2012 at Irula settlements of Tamil Nadu. Information regarding the usage of snake bite antidote medicinal plants was collected directly from the herbal healers or villagers, elderly tribal man. About 30 herbal healers were interviewed for the above purpose. During the interview the informants whose age ranged from 60-85 years old, displayed specimens of anti snake bite medicinal plants. Plants collected by the informants were identified

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with the help of flora [11,12]. Repeated interviews were made to understand their knowledge, methods of diagnosis, mode of application, treatment and food restriction during treatment period. During the interview, information regarding the part of plant, dosage, mode of administration and diet restrictions, if any during treatment period was also recorded.

RESULT

During the study period several traditional Irula healers were interviewed to gather information about the use of snakebite antidote plants. They have an authentic knowledge in identification, collection and preparation of antidote out of these plants. The plants/parts used alone or in combination with other plants to make antidotes. The detailed method of antidote preparation and mode of administration are given in Table 1. This study revealed the information of 30 traditional medicinal plants which are used by Irula against snake bite. Plant species are enumerated with botanical name, vernacular name (Tamil), part used and mode of administration as described in Table 1. The 30 plants are distributed in 21 families and 27 genera of which 10 herbs, 7 shrubs, 6 trees and 7 climbers. Regarding the use of plant part, leaf constitute 23.3%, bark 13%, stem 3.3%, root 17%, flower 3.3%, tuber 3.3%, pseudo stem 3.3%, seed 3.3% and whole plant 30% (Fig. 1). Whole plant is focused to be used in highest percentage while flower, tuber, pseudo stem, seed and stem in least percentage.

DISCUSSION

The present study deals with snake bite antidote plants used by Irula tribes of Tamil Nadu. Similar type of practice was found in different ethnic groups throughout the world [13]. In this study we gathered information about 30 medicinal plants in 21 families, 27 genera specifically used against snake bite. The ethnic groups of Chittoor district of Andhra Pradesh use 32 plant species in 31 genera belongs to 23 families[14] .A survey conducted in West Bengal among 12 tribal groups revealed the use of 40 medicinal plants in 35 genera belongs to 24 families as snake bite antidote[15]. Another study conducted among the Thakar tribes of Raigad district in Maharashtra reported the use of 15 plant species in 15 genera belong to 14 families to treat snake bite[16]. In an ethnobotanical investigation [17] in Salem district of Tamil Nadu, among the village herbalist, village dwellers, herbal practitioners and other traditional healers reported 10 plant species in 8 genera belongs to 7 families specifically used to cure snake bite. In Dharmapuri district of Tamil Nadu, a study was conducted among Kurumba tribes revealed the use of five medicinal plants against snake bite [18]. Similarly 15 medicinal plants are reported to be used to treat snake bite by Kani tribes of Tirunelveli district in Tamil Nadu [19]. In other districts of Tamil Nadu like Nilgiri[8], Erode[5] and Coimbatore[10] the native Irula tribes use six, two and two plants respectively to cure snake bite.

In this study the majority of plants (33%) used to treat snake bite by Irula are found to be herbaceous in nature. Shrubs and climbers constitute each 23% and trees constitute 20%.

Regarding the use of plant part, leaf constitute 23.3%, bark 13%, stem 3.3%, root 17%, flower 3.3% , tuber 3.3%, pseudo stem 3.3%, seed 3.3% and whole plant 30%.Whole plant is found to be used in highest percentage while flower, tuber, pseudo stem , stem and seed in least percentage. But in other studies [6,8,20,21] revealed the use of root in highest percentage than other parts. Leaves are found to be the major plant part (33.3%) used by Kani tribes of Tirunelveli district [22]. In our study the whole plant usage was found to be in highest proportion. This is because the majority of plants used by Irula tribes of this district are herbs.

The present investigation revealed that 30 medicinal plant species belongs to 27 genera and 21 families commonly used for venomous snake bites by Irula tribe.

CONCLUSION

This study demonstrated that the plants used for snake bite treatment by Irula tribes possess some chemical responsible for snake venom inhibition. The present study has revealed the authencity of traditional knowledge of the Irula tribe of Tamil Nadu. This traditional knowledge has to be protected for the well being of the future generation to come. More chemicals and pharmacological studies are required to confirm the anti venom properties of Irula medicinal plants.

ACKNOWLEDGEMENT

We thank all the Irula informants for sharing their secret traditional knowledge. We are thankful to Tamil Nadu State Council for Higher Education (TNSCHE), Chennai for the Student Mini Project work to R.Gnanavel during the academic year 2011 -2012; The Principal and Dr. M.Dorai Head of Botany department, Government Arts College, Udhagamandalam for permitting us to carry on this project work.

Table 1. List of medicinal plants and antidote preparation against snake bite by Irula tribe.

Botanical name	**Family**	**Vernacular name**	**Part used**	**Mode of administration**
Acalypha indica L.	Euphorbiaceae	Kuppaimeni	Whole plant	The powder (10g) prepared out of these plants used against all types of snakebite
Alangium salvifolium(L.f)	Alangiaceae	Alingil	Bark	
Andrographis alata Nees.	Acanthaceae	Periyanangai	Whole plant	
Andrographis paniculata Nees.	Acanthaceae	Siriyanangai	Whole plant	
Aristolochia bracteolata Lam.	Aristolochiaceae	Aadutheandapalai	Whole plant	
Azadirachta indica (L.)Adr.Juss.	Meliaceae	Vembu	Bark	
Corollocarpus epigaeuss Rotter.	Cucurbitaceae	Agasa garudan	Tuber	
Enicostemma axillare (Lam.) A.Raynal,	Gentianaceace	Vellaragu	Whole plant	
Leucas aspera Spreng.	Lamiaceae	Thumbai	Whole plant	
Strychnos nux-vomica Linn.	Loganiaceae	Yetti	Bark	
Albizia lebbeck (L.)Benth.	Mimosoidaceae	Vagai	Flowers	Oral administration of well grained flower mixed with hot water as antidote to pit viper bite.
Argemone mexicana L.	Papaveraceae	Brammathandu	Whole plant	30 ml of whole plant juice is administered internally as well as its paste is applied on snake bitten area as antidote to all type of snakes.
Aristolochia indica L.	Aristolochiaceae	Perumarundhu	Root	The root was chewed at the time of bite.
Calotropis gigantea R.Br.	Asclepiadaceae	Vella erukku	Leaves	Leaves paste about 15g is administered orally as antidote for cobra bite. More than this quantity causes unconsciousness.
Ceropegia elegans Wallich	Asclepiadaceae	Perungilangu	Root	The root was chewed at the time of snake bite.
Clerodendron inerme (L.) Gaertn.	Verbenaceae	Sanganguppi	Leaves	500ml of leaf extract administered internally as antidote to all type of snake bite.
Creteva adansonii DC.	Capparaceae	Maavilangam	Leaves	15ml of leaf juice is administered internally as antidote to viper bite
Cynodon dactylon (L.) Pers.	Poaceae	Arugampul	Leaves	20g of *Tephrosia purpurea*, 30g of *Cynodon dactylon* and nine seeds of *Piper nigrum* are grained well and
Piper nigrum L.	Piperaceae	Milagu	Seed	

Tephrosia purpurea (L.) Pers.	Papilionoideae	Avuri	Root	take 5g orally continuously for six days at three times, is a best antidote for snake bite.
Datura meteloides L.	Solanaceae	Karuumathai	Root	250g of *Datura meteloides* root and 250g of *Pergularia daemia* leaves both are boiled with neem oil. It was filtered. The filtrate applies on the snake bite region.
Pergularia daemia (Forsskal) Chiov.	Asclepiadaceae	Veliparuthi	Leaves	
Dipteracanthus patula (Jacq.)Nees.	Acanthaceae	Kiranthi nayagam	Leaves	5-6 leaves are chewed it act as antidote to snake bite.
Dipteracanthus prostrates (Poiret)Nees.	Acanthaceae	Silanthi nayagam	Whole plant	60ml of whole plant juice is administered internally as well as it paste is applied on the snake bite area as antidote to all types of snake bite.
Hemidesmus indicus (L.) Schult.	Asclepiadaceae	Nannari	Root	Root is crashed and chewed as antidote against snake bite.
Musa paradisiaca L.	Musaceae	Vaazhai	Pseudo- stem	100ml of Pseudo-stem juice is administered internally as antidote for all kinds of snake bite.
Opuntia stricta (Haw.) Haw.	Cactaceae	Sappathikalli	stem	Skin peeled stem cut into 8 pieces and mixed piper powder is directly administered orally as antidote for snake bite.
Rhinacanthus nasutus (L.) Kurz.	Acanthaceae	Nagamalli	Whole plant	Leaf powder about 15g is a good antidote for cobra bite.
Thespesia populnea (L.)Sol.	Malvaceae	Puvarasu	Bark	25ml of bark juice mixed with equal volume of ginger juice is administered orally for snake bite.
Tylophora indica (Burm.f)Merr.	Asclepiadaceae	Nanjarupan	Leaves	Leaf juice use against Cobra and King cobra.

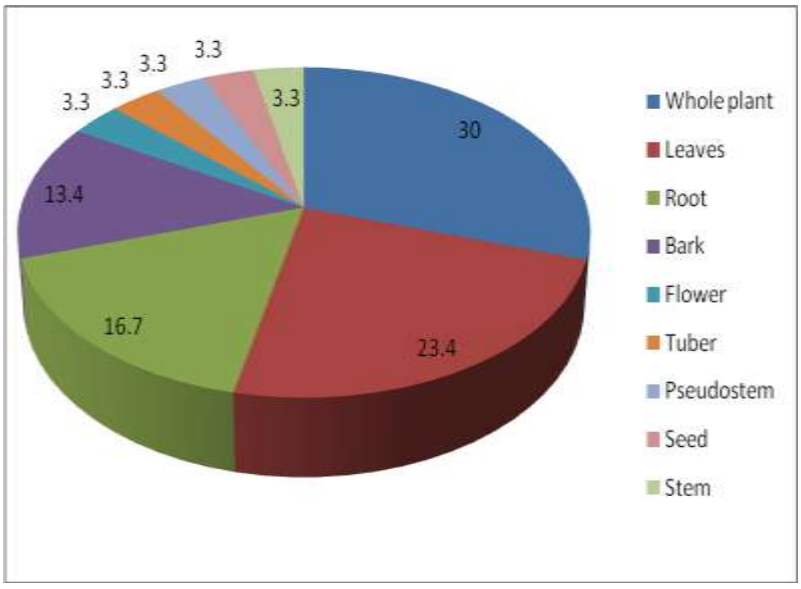

Fig.1 Statistics of plant parts used

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