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Herbal/Folk remedies used for snake bites by tribals/rural people of Rayalaseema region, Andhra Pradesh, India

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Abstract

Objective: An ethnobotanical survey was conducted in forest and adjoining rural areas of Rayalaseema region, Andhra Pradesh to collect firsthand information on herbal remedies used for snake bite.

Methods: The ethnomedicinal study was carried out in four districts of Rayalaseema region of Andhra Pradesh during 2009-2012. The firsthand information on their traditional use of medicinal plants was recorded. Repeated interviews/enquiries were made to understand their knowledge, methods of diagnosis and mode of administration from the tribal communities (Chenchus, Sugalis, Yanadis and Yerukalas) inhabiting in and around the forests of the study area.

Results: The present study enumerates 41 ethnomedicinal plant species belonging to 26 families used by the tribal communities/medicinal healers of Rayalaseema region, used as antidotes to snake bite. The collected crude drugs were taxonomically identified and the botanical names were enumerated alphabetically along with their family, vernacular name, part(s) used and mode of preparation/administration.

Conclusion: The importance of traditional medicinal system among the tribal communities of Rayalaseema region of Andhra Pradesh has been highlighted in the present study.

Keywords: Folklore information, Snakebites, Rayalaseema region, Andhra Pradesh.

Introduction

India is endowed with wealthy biodiversity where medicinal plant diversity is also notable spreading over the country. India is a mega biodiversity country among 12 in the world with forest area of 23.81% of the country's geographical area. India constitutes nearly 45,000 plant species, of which 7,000 to 8,000 species utilized by local people as medicinal plants [7, 8]. Around 85 % traditional medicines are acquired from herbs and used to cure several human ailments. Traditional knowledge on herbal medicines based on folklore information was documented by several ethno botanists from India and other countries [19].

Snake bite is a neglected public health problem in tropical and subtropical countries, where rural populations are mainly affected. It is a common occupational hazard mainly in farmers, plantation workers, herders and laborers leading to significant morbidity and mortality that remains largely unreported [24]. The general poisonous snakes found in India are Cobra (*Naja naja*), Russell's viper (*Daboia russelli*), Krait (*Bangarus caeruleus*) and Saw scaled viper (*Echis carinatus*) [4].

India is reported to have the highest number of snake bites (81,000) and deaths (11,000) per year [3]. However, the geographical distribution and statistics are variable in the country due to gross underreporting, resulting in massive statistical disparity. Estimates of death due to snake bite range widely from 1,300-50,000. According to statistics of Indian Government, there were 61,507 snake bites with mortality of 1124 in 2006; 76,948 bites and 1359 deaths in 2007. A high mortality of 50,000 deaths each year has also been published [23]. In the state of Maharashtra an average of 1,224 deaths per year (2.43 deaths per 1, 00,000 per year) were reported between 1974 and 1978. Random community based surveys in some localities in West Bengal, have shown much higher annual mortality rates of 16.4 deaths per 1, 00,000 [11]. A report by the hospitals of Government of India, from all states, revealed 1,364 deaths due to snakebites in 2008, believed to be gross under reporting, as rural victims seek traditional treatment [10]. The annual snakebite deaths are maximum (6.1) in Andhra Pradesh when

compared to that of nationwide (3.6 – 4.5), while such death rate in rural areas is still higher than 6.2 [5].

Snake bites were considered emergency threats for human life. Perhaps, venomous bites show as double teeth marks than ordinary bites. Snake venom is one of the most amazing and unique adoptions of snakes in animal planet. Venoms are mainly toxic modified saliva consisting of a complex mixture of chemicals called enzymes found in snake poisons throughout the world known to man. Broadly there are two types of toxins namely neurotoxins, which attack the central nervous system and hemotoxins which target the blood circulatory system. Snakes with neurotoxic venom include cobras, mambas, sea snakes, kraits and coral snakes. Snakes with hemotoxic venom include rattlesnakes and vipers [6].

To date, only a few species have been scientifically investigated with their active components isolated and characterized both structurally and functionally. India received very good attempts on ethnobotanical survey of medicinal plants used for snake or poisonous bites [2, 15, 18, 24]. Very little and sporadic attempts were made on ethnobotanical information regarding to snake bites from Andhra Pradesh [14, 16, 22]. Hence, the present study is focused on the preliminary survey of medicinal plants for therapeutic application of snakebite and extensive traditional use in indigenous groups in the part of Rayalaseema region, Andhra Pradesh, India.

2. Materials and Methods

2.1. Study area

Rayalaseema is a geographic region in the state of Andhra Pradesh in India. It includes the southern districts of Anantapur, Chittoor, Kadapa and Kurnool. It has a total area of 67,299 km². These telugu-speaking districts were part of Madras Presidency until 1953 when Telugu speaking districts of Madras Presidency were carved out to form Andhra state between 1953 and 1956. The Rayalaseema was ruled by the emperor Sri Krishnadevaraya. Rayalaseema was the original home of Eastern Chalukyas, they gradually extended their sway over Karnataka country because of the pressure from Cholas kings. Although Rayalaseema is a small region compared to the rest of Telugu speaking regions, its contribution to Telugu, Kannada, Tamil, Urdu, arts, culture and literature is immense. Before and around the period of Chalukya, i.e., 7CE period, it is also called "Hiranyaka Rastramu". Only during and after the Vijayanagara era is it called Rayalaseema.

Rayalaseema is situated almost in the center of southern part of the Indian peninsula. Geographically it is located between 12° 30' and 16° 15' N latitudes and 76° 0' 55" and 79° 0' 55" E longitudes, covering 23.95% of the total area of the state. It is bounded on the south by Tamilnadu, on the west by Karnataka, while Telangana and Coastal regions of Andhra Pradesh forms the north and east boundaries respectively Fig-1. The Rayalaseema has no coastal line and is accessible only by land. The major soil types of the area are red soils, red loams and black cotton.

2.2 Ethnic groups of the study area

The main tribal communities of the area are the Chenchus, Sugalis, Yanadis and Yerukalas and most of them scattered all over the region except Chenchus, who have restricted distribution in the Nallamalais of Kurnool district only.

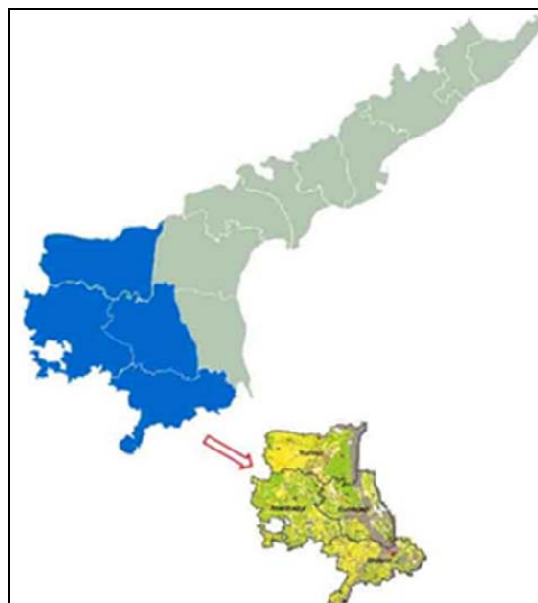


Fig 1: Map of Rayalaseema Region

2.3. Ethnobotanical survey and herbarium preparation

Plant specimens and ethnomedicinal information were collected from the field during the flowering and fruiting periods. Traditional healers and knowledgeable persons were interviewed. The detailed information regarding local name, parts used, mode of administration/ preparation were recorded in field note book. The collected information were cross checked with the information from neighbouring herbalists and also with available literature. The specimens were identified with the help of local / regional floras [9, 12, 21] and confirmed by comparing with authentic specimens housed at Sri Krishnadevaraya University Herbarium (SKU), Ananthapuramu. The herbarium specimens were prepared according to the standard methods [13] and the voucher specimens were deposited at the Department of Botany (SKU), Sri Krishnadevaraya University, Ananthapuramu, India.

3. Results and Discussion

Traditional herbal medicine is readily available in rural areas for the treatment of snakebite. Application of the plant part or its sap onto the bite area, chewing leaves and bark or drinking plant extract or decoctions are some procedures intended to counteract snake venom activity. Plants are used either single or in combination, as antidotes for snake envenomation by rural populations in India and many parts of the world. Plants are reputed to neutralize the action of the snake venom, with a plethora of plants claimed to be antidotes for snakebites in folk medicine [17].

During the present attention and interaction with the tribals, village dwells, local vaidhyas, village herbalist, herbal medicinal practitioners and other traditional healers of Rayalaseema region of Andhra Pradesh. A total of 41 spp distributed among 36 genera belonging to 26 families were identified for medicinal uses during the investigation. In this article, 41 medicinal plants distributed at various places in Rayalaseema region have been enlisted in alphabetical order of scientific name, vernacular name part used traditional uses are listed for each species (Table-1). The largest number of species used medicinally belongs to family Acanthaceae 4spp (9.7%) followed by Fabaceae, Euphorbiaceae 3 spp each (7.3%), Aristolocaceae and Loganiaceae 2 spp each (4.8%) remaining 16 families have one species each (2.4%). The results are summarized in Table -2 and Fig -2.

Table 1: Herbal/Folk medicinal plants used for snake bites

S.No	Botanical name	Vernacular Name	Family	Part used	Mode of administration
1	<i>Abrus precatorius</i> L.	Guruvinda	Fabaceae	R	Paste prepared with water and applied on bitten area.
2	<i>Acalypha indica</i> L.	Muripinda	Euphorbiaceae	L	Extract filtered and dropped into ears.
3	<i>Achyranthes aspera</i> L.	Uttareni	Amaranthaceae	Wp	Mixed with pepper, garlic ground and the extract given orally.
4	<i>Aegle marmelos</i> (L.) Correa	Maredu	Rutaceae	Rb	Macerated into paste and applied over the bitten area.
5	<i>Albizia lebbek</i> (L.) Benth.	Dirisena	Mimosaceae	Sb (Fr)	Macerated with water, juice is taken orally for 3 times. It results in vomiting.
6	<i>Alangium salvifolium</i> (L.f) Wangerin	Ooduga	Alangiaceae	Rb	Ground, paste given orally and also as external application.
7	<i>Andrographis echioides</i> Nees.	Tella vemu	Acanthaceae	Wp	Extract given orally.
8	<i>Andrographis lineata</i> Nees.	Tella nelavemu	Acanthaceae	L	Decoction given orally.
9	<i>Andrographis paniculata</i> (Burm.f.) Nees.	Nelavemu	Acanthaceae	Wp	Decoction given orally.
10	<i>Anogeissus latifolia</i> (Roxb.ex DC) Wall.ex Guill.	Thir manu	Combretaceae	Sb	Ground, paste applied externally and juice given orally.
11	<i>Aristolochia bracteolata</i> Lam	Gadida gadapa	Aristolochiaceae	Wp	Powdered macerated into paste and applied on bitten area and slightly warmed.
12	<i>Aristolochia indica</i> L.	Nalleshwari	Aristolochiaceae	R	Ground with dried ginger and paste applied on bitten area and two spoonful of extract given orally for three times a day.
13	<i>Barleria cristata</i> L.	Tellanilambari	Acanthaceae	Wp	Decoction given orally.
14	<i>Boswellia serrata</i> Roxb.ex Colebr.	Konda sambrani	Burseraceae	Sb	Extract given orally.
15	<i>Cardiospermum halicacabum</i> L.	Budda kakara	Sapindaceae	Wp	Ground, given orally for 3 days twice a day.
16	<i>Cassia auriculata</i> L.	Tangedu	Caesalpiniaceae	L (Fr)	Chewed repeatedly.
17	<i>Cassia occidentalis</i> L	Kasintha	Caesalpiniaceae	R	Decoction given orally.
18	<i>Chloroxylon swietenia</i> DC.	Billudu	Flindersiaceae	Sb	Ground in urine, made into paste, applied on affected area.
19	<i>Cissus pallida</i> (Wight & Arn.) Planch.	Nela gummu	Vitaceae	Tb	Ground with pepper & garlic and the mixture given orally.
20	<i>Croton scabiosus</i> Bedd.	Verri chilla	Euphorbiaceae	Sb	Decoction given orally.
21	<i>Entada pursaetha</i> DC.	Adavi chinta	Mimosaceae	Sd	One tea spoonful of powder mixed in water and taken orally.
22	<i>Euphorbia thymifolia</i> L.	Paccha bottlu	Euphorbiaceae	Wp	Ground, powder given orally.
23	<i>Evolvulus alsinoides</i> L.	Vishnu krantha	Convolvulaceae	Wp	Extract given orally.
24	<i>Helicteres isora</i> L.	Guba tada	Sterculiaceae	R & Sd	Extract given orally and paste applied on bitten area.
25	<i>Holarrhena pubescens</i> Wall.ex G.	Kola mukhi	Apocyanaceae	Sb	Shade dried, boiled in water and decoction given orally.
26	<i>Leucas aspera</i> Spreng.	Thummi	Lamiaceae	L	Along with that of garlic, ground, mixed in rice washed water, given orally.
27	<i>Maytenus emarginata</i> (Willd)	Telukondi kaya	Celastraceae	Sb	Dried powder given orally with water in three doses.
28	<i>Mitragyna parvifolia</i> (Roxb.) Korth.	Rudra ganapa	Rubiaceae	Sb	Extract as external application.
29	<i>Ocimum basilicum</i> L	Kamma goggari	Lamiaceae	Wp	Ground into paste and applied externally.
30	<i>Plumbago zeylanica</i> L	Tella chitramulamu	Plumbaginaceae	R	Macerated in water and drunk.
31	<i>Prosopis cineraria</i> (L.) Druce	Tumma	Mimosaceae	L	Ground in butter milk and the paste applied over the bitten area.
32	<i>Psoralea corylifolia</i> L	Bavanchalu	Fabaceae	Sd	Ground in water, filtered and poured in nostrils.
33	<i>Pterocarpus santalinus</i> L.f.	Yerra chandanam	Fabaceae	Sb	Mixed with garlic and pepper, ground and infusion given orally.
34	<i>Salvadora persica</i> L.	Gunnangi	Salvadoraceae	L	Mixed with salt and given orally.
35	<i>Strychnos nux-vomica</i> L	Musti	Loganiaceae	Rb	Along with that of ginger and root bark of <i>Calotropis gigantea</i> powder given orally.
36	<i>Strychnos potatorum</i> L	Chilla ginjalu	Loganiaceae	Sd	Extract given orally and applied on the bitten area.

37	<i>Tinospora cordifolia</i> (Thumb.) Meirs.	Tippa teega	Menispermaceae	R	Crushed and mixed with children's urine, given orally.
38	<i>Trianthema decandra</i> L. Mant	Tella galijeru	Aizoaceae	R	Extract given orally.
39	<i>Tylophora indica</i> (Burm.f.) Merr.	Mekameyani teega	Asclepiadaceae	R	Extract given orally and paste as application.
40	<i>Wrightia arborea</i> (Dennst.) Mabb.	Pedda palapariki	Apocyanaceae	Rb	Extract given orally.
41	<i>Wattakaka volubilis</i> (L.f.) Stapf.	Peddapalateega	Asclepiadaceae	R	Decoction given orally and paste as external application.

R: Root, Rb: Root bark, Tb: Tubers, Sb: Stem bark, L (fr): Leaves Fresh, Sd: Seed.

Table 2: Taxonomic analysis of crude drugs (family wise)

S. No	Name of the family	No of species	% of richness
1	Acanthaceae	4	9.7
2	Aizoaceae	1	2.4
3	Alangiaceae	1	2.4
4	Amaranthaceae	1	2.4
5	Apocyanaceae	2	4.8
6	Aristolochaceae	2	4.8
7	Asclepiadaceae	2	4.8
8	Burseraceae	1	2.4
9	Caesalpiniaceae	2	4.8
10	Celastraceae	1	2.4
11	Combretaceae	1	2.4
12	Convolvulaceae	1	2.4
13	Euphorbiaceae	3	7.3
14	Fabaceae	3	7.3
15	Flindersiaceae	1	2.4
16	Lamiaceae	2	4.8
17	Loganiaceae	2	4.8
18	Menispermaceae	1	2.4
19	Mimosaceae	3	7.3
20	Plumbaginaceae	1	2.4
21	Rubiaceae	1	2.4
22	Rutaceae	1	2.4
23	Salvadoraceae	1	2.4
24	Sapindaceae	1	2.4
25	Sterculiaceae	1	2.4
26	Vitaceae	1	2.4

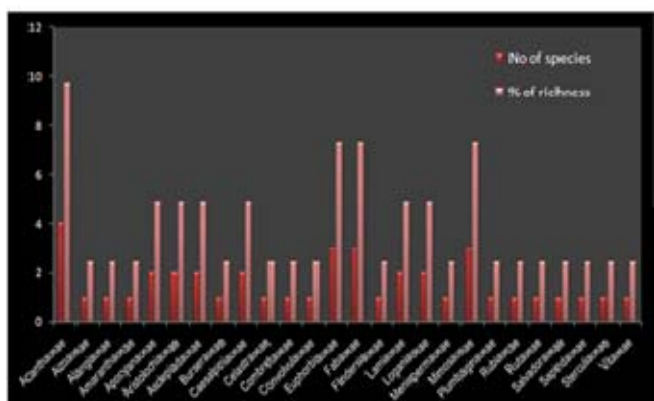


Fig 2: Statistical analysis of crude drugs: family wise analysis

The present results showed that many parts of individual plant species are used as medicine and the most largely used medicinal plant part was the stem bark, root and whole plant (9 species), followed by leaves (6 species), root bark (4 species) seeds (3 species), tuber 1 species Table-3. The medicinal plants are utilized as whole or their parts in the form of decoction, powder, paste and extract. The application of crude drugs with details such as part(s) used single, combination with other ingredients, mode of administration and

method of administration were recorded in the field. The percentage of plant parts used in drug preparations is as follows: whole plant, stem bark and root 21.95%, leaves 14.63%, root bark 9.75% and tuber 2.43% Fig-3. Maximum utility of whole plant in the medicinal application reveals either these plants are easily available or they may have potent medicinal properties. Popular medicinal plants such as *Andrographis paniculata*, *A. serpyllifolia*, *Aristolochia indica*, *A. bracteolata*, *Entada pursaetha*, *Euphorbia thymifolia* and *Leucas aspera* were used for snake bite.

Plants have been used in folklore medicine for thousands of years [1]. The knowledge of medicinal plants has been gathered from different medicinal systems such as Ayurveda, Unani and Siddha. In India it is reported that folklore healers used 2500 plant species, among which 100 species serves as regular source of medicine [20]. Ethnobotany indicates that sufficient Research work has been done in various parts of India. The present study deals

Table 3: Statistical analysis of crude drug samples: Part-wise analysis

S. No	Plant part	No of species used	% of richness
1	Leaves	6	14.63
2	Seed	3	7.3
3	Stem bark	9	21.95
4	Root	9	21.95
5	Root bark	4	9.75
6	Tuber	1	2.43
7	Whole plant	9	21.95

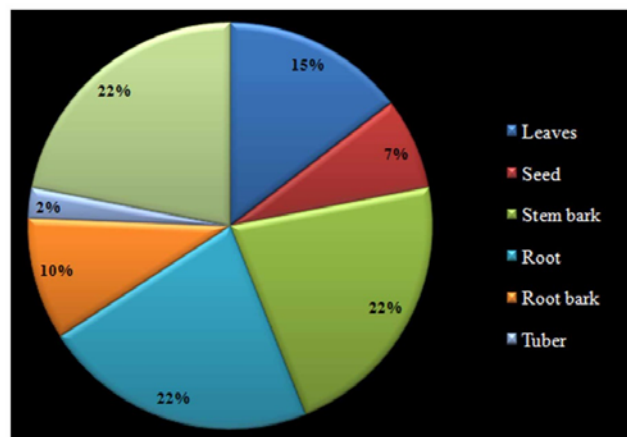


Fig 3: Statistical analysis of crude drug samples: Part-wise analysis

With the ethnomedicinal plants which are used by tribal people and method of snake bite treatments using these plants is discussed. Medicinal plants play an important role in providing information to the researchers in the field of ethnobotany and Ethnopharmacology. The observation of current research showed that traditional medicines have been involved with a significant role among the local people of Rayalaseema region. In this region, the traditional medicinal mode is very efficient, supportive and successful in the treatment of snake bite. Ethnomedicinal survey is most beneficial for research scholars, scientist and scientific companies for further research on isolation and identification of phytoconstituents that can be formulated into various medicines.

4. Conclusion

The tribal and local people of Rayalaseema region of Andhra Pradesh have been using many plants of therapeutic purpose since time immemorial. Local people and tribals mainly depend on the plants for snake bite. They are also very familiar with the antidotes for snake bites. Over exploitation of plant species in the name of drug may lead some species extremely to the disappearance of such species in future. Therefore, attention should be made on correct use in order to reduce over exploitation of these plants. The present study may thus prove to be of great use to the pharmacology, phytochemistry, researchers, conservationists, foresters and people interested in herbal medicine. Finally, to conclude, this research paper may also provide worthy information to pharmacologists and biochemists in screening of individual species and their phytochemicals to accelerate the drug discovery and evaluation process for the treatment of snake bite. The study area is wealthy in medicinal plant resources. For the benefit of the community the reported plant species should take attention and also steps to be taken for conservation as well as multiplication of these plant species.

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6. References

1. Abu-Rabia A. Urinary diseases and ethnobotany among pastoral nomads in the Middle East. *Journal of Ethnobiology and Ethnomedicine*. 2005; 1:4.
2. Antony Gomes, Rinku Das, Sumana Sarkhel, Roshnara Mishra, Sanghamitra Mukherjee, Shamik Bhattacharya, *et al.* Herbs and herbal constituents active against snake bite *Indian Journal of Experimental Biology*. 2010; 48:865-878.
3. Anuradhani Kasturiratne, Rajitha Wickremasinghe A, Nilanthi de Silva, Kithsiri Gunawardena N, Arunasalam Pathmeswaran, Ranjan Premaratna *et al.* The global burden of snakebite: a literature analysis and modelling based on regional estimates of envenoming and deaths. *PLoS Med* 2008; 5(11):e218.
4. Bawaskar HS. Snake venoms and antivenoms: critical supply issues. *Journal of Association Physician of India*. 2004; 52:11-13.
5. Bijayeeni Mohapatra, David A Warrell, Suraweera W, Prakash Bhatia, Neeraj Dhingra, Raju M Jotkar, *et al.* Snake bite mortality in India: A nationally representative mortality survey. *Plos Neglected Tropical Diseases* 2011; 5(4):e1018.
6. Blanchard DL. 2008. The cold blooded news. The newsletter of the Colorado Herpetological Society. [Web page on the internet] 2001; 28(3). Cited on 12/04/2008. Available from: <http://webspinners.com/coloherp/cb-news/vol28/cbn0103/Venom.html>.
7. Chinnappan Alagesaboopathi. Ethnomedicinal plants used for the treatment of Snake bites by Malayali tribal's and rural people in Salem district, Tamilnadu, India. *International Journal of Biosciences*. 2013; 3(2):42-53.
8. Dubey NK, Kumar R, Tripathi P. Global promotion of herbal medicine: Indian opportunities. *Current Medicine* 2004; 86:37-41.
9. Gamble JS. *Flora of Presidency of Madras, Botanical Survey of India, Calcutta*. 1921; 1, 2.
10. Government of India, Central Bureau of Health Intelligence. Health Status Indicators, National Health Profile 2007 and 2008 (Provisional): 3.1.9 State/UT wise Cases and Deaths Due to Snake Bite in India. 107-108.
11. Hati AK, Mandal M, De MK, Mukherjee H, Hati RN. Epidemiology of snakebite in the district of Burdwan, West Bengal. *J Indian Med Assoc* 1992; 90:145-147.
12. Jain SK. *Dictionary of Indian folk medicine and ethnobotany*. Deep publications, New Delhi, 1991.
13. Jain SK, Rao RR. *A Handbook of Field & Herbarium Methods*. Today and Tomorrows Printer & Publication, New Delhi. 1997.
14. Johnson Saturas N, Venkata Ratnam K, Tirupathi Reddy G, Venkata Raju RR. Taxonomic Validation of Crude Drugs used for Poisonous Bites by Adivasis of Rayalaseema Region, Andhra Pradesh. *Ethnobotanical Leaflets* 2008; 12:934-37.
15. Kanojia Anita, Chaudhari Kishor, Shivaji Gothecha, Vinod Kumar. Medicinal plants active against snake envenomation. *IJRAP* 2012; 3(3):363-366.
16. Khaleel Basha, Sudarsanam G, Traditional Use of Plants against Snakebite in Sugali tribes of Yerramalais of Kurnool district, Andhra Pradesh, India. *Asian Pacific Journal of Tropical Biomedicine* 2012; S575-S579.
17. Kirtikar, Basu BD. *Indian Medicinal Plants*. International Book Distributors, Dehra Dun, India, p.1975; 1-4:2793.
18. Kuntal Das. Medicinal Plants for Snake Bite Treatment - Future Focus. *Ethnobotanical Leaflets* 2009; 13:508-21.
19. Mukharjee PK, Wahil A. Integrated approaches towards drug development from Ayurveda and other systems of medicine. *Journal of Ethnopharmacology*. 2006; 103:25-35.
20. Pei SJ. Ethnobotanical approaches of traditional medicine studies: Some experiences from Asia. *Pharmaceutical Biology* 2001; 39:74-79.
21. Pullaiah T, Moulali D. *Flora of Andhra Pradesh*. 1sted, Scientific Publisher Jodhapur. 1977, 1, 2.
22. Tarakeswara Naidu MN, Chandra Babu, Venkaiah M. Ethnic remedies against snakebite from Kotia hills of Vizianagaram district, Andhra Pradesh, India. *Indian Journal of Natural Products and Resources*. 2013; 4(2):194-196.
23. Warell DA. Epidemiology of snake bite in South-East Asia Region. In: Warrell DA (ed.) *Guidelines for the management of snakebite*. New Delhi: WHO regional office for Southeast Asia 2010.
24. Yogendra Kumar Gupta and Sharda Shah Peshin. Snake Bite in India: Current Scenario of an Old Problem. *J Clin Toxicol*. 2014; 4(1):182.