Ethnic remedies against snake bite from Kotia hills of Vizianagaram district, Andhra Pradesh, India

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The paper provides information about the treatment of snake bite by tribal people of Kotia hills of Vizianagaram district. The ethnomedicine comes from 17 plant species belonging to 17 genera and 14 families of Magnoliophyta. The tribal inhabitants of the study area largely constitutes of Mannedora, Kondadora, Jatapu and Savara. The documentation of these medicinal plants against snake bite reveals that these ethnic people are still dependent on local vegetation for their life care.

Keywords: Snake bite, Ethnomedicine, Kotia hills, Vizianagaram district

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Introduction

The use of medicinal plants was a chosen practice throughout human history, the knowledge of which gathered through the experience of many generations represents accrued popular wisdom. These medicinal resources were largely obtained from the vegetable kingdom. So ethnic medicine has contributed to the discovery and development of many drugs which are still in use, such as morphine, the main anaesthetic alkaloid being opium1. Venomous snakebites kill human and their pet animals2. It remains an important problem to find suitable antidotes in both developing and developed countries3. Plants are used as antidotes for snake venom by rural populations in India and in many parts of the world2,8. Traditional herbal medicine has been readily available in rural areas for the treatment of snake bite while it is not easily available in urban areas. The tribal inhabitants of the study area mainly consist of Mannedora, Kondadora, Jatapu and Savara. Earlier, some ethnombotanical works in Andhra Pradesh were carried out13 but the present study was undertaken since there is no documentation of ethnic remedies for snake bite of Kotia hills from Vizianagaram district of Andhra Pradesh, India.

Materials and Methods

Ethnomedicinal survey was carried out during 2009–2011 in the tribal hamlets of Kotia Hills. The Kotia hills are in a disputed area between the governments of Andhra Pradesh and Orissa and lies between 18° 26' 063" and 18° 55' 200" North latitudes and 83° 10' 426" and 83° 24' 764" East longitude, the elevation ranges from 850m to 1615m. Ethnobotanical data was collected according to the methodology suggested by Jain14. The information was tapped by interviewing repeatedly the tribal people, their medicine men, witch doctors, elder men and women. Local names, plant parts used and mode of administration were recorded. For documentation, plant specimens were collected and studied with the help of local floras15,16, their nomenclature was updated and the voucher specimens were deposited in the Herbarium of Botany Department (BDH), Andhra University, Visakhapatnam.

Results and Discussion

The present study revealed that totally 17 plants distributed in 17 genera belonging to 14 families and different modes of treatment for snake bite were followed by tribes of Kotia hills of Vizianagaram district, Andhra Pradesh, India. In the following documentation, the species are arranged alphabetically and include information about scientific name, vernacular name, family names of these medicinal plants along with the plant parts used and ethnomedicinal usage (Table 1). Caesalpiniaeae, Mimosaceae, and Apocynaceae have 3 species for each family and one species each for Lamiaceae, Arecaceae, Bignoniaceae,
Table 1—Medicinal plants used for the treatment of snake bite by local people of Kotia hills

<table>
<thead>
<tr>
<th>Botanical Name/Family/Local name</th>
<th>Habit</th>
<th>Part used</th>
<th>Mode of administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia nilotica (L.) Delile., Mimosaceae, Nalla tumma</td>
<td>Tree</td>
<td>Stem bark</td>
<td>Stem bark paste with seeds of <em>Piper nigrum</em> applied immediately on the bitten areas.</td>
</tr>
<tr>
<td>Anisomeles indica (L.) O. Ktze., Lamiaeae, Chinna ranabheri</td>
<td>Shrub</td>
<td>Roots</td>
<td>Root powder applied on the wound for 3 days.</td>
</tr>
<tr>
<td>Aristolochia indica L., Aristolochiaceae, Nalla eswari</td>
<td>Climber</td>
<td>Roots</td>
<td>Roots paste with dried ginger <em>Zingiber officinale</em> Rosc. applied on the bitten area.</td>
</tr>
<tr>
<td>Bauhinia variegata L., Caesalpiniaeae, Devakanchanam</td>
<td>Tree</td>
<td>Roots</td>
<td>Root paste applied on the bitten area.</td>
</tr>
<tr>
<td>Bixa orellana L., Bixaceae, Jabaru kaya</td>
<td>Tree</td>
<td>Leaves</td>
<td>Filtrate from root bark crushed with jaggery and administered two spoonfuls a day for 15 days.</td>
</tr>
<tr>
<td>Caesalpinia bonduc (L.) Roxb., Caesalpiniaceae, Gatchakaya</td>
<td>Shrub</td>
<td>Seeds</td>
<td>Pills from seeds ground with <em>Sesamum indicum</em> L. oil and given 2 pills twice a day for 30 days.</td>
</tr>
<tr>
<td>Eclipta prostrata (L.) L., Asteraceae, Guntagalagaraku</td>
<td>Herb</td>
<td>Aerial part</td>
<td>7mL of plant decoction given orally twice a day for one month and minimum in take of spices, fat and salt during the treatment.</td>
</tr>
<tr>
<td>Hemidesmus indicus (L.) R. Br., Asclepiadaceae, Sagandhi pala</td>
<td>Climber</td>
<td>Roots</td>
<td>Paste from roots with <em>Allium sativum</em> L. and applied immediately after snakebite.</td>
</tr>
<tr>
<td>Jatropha curcas L., Euphorbiaceae, Nepalam</td>
<td>Shrub</td>
<td>Seeds</td>
<td>Decoction from seed powder with roots of <em>Holarrhena antidysenterica</em> (L.) Wall. and <em>Hemidesmus indicus</em> and given 2 spoonfuls twice a day for 2 days.</td>
</tr>
<tr>
<td>Merremia gangetica (L.) Cuford., Convulvulaceae, Eluckachi auk</td>
<td>Herb</td>
<td>Roots</td>
<td>Root tubers paste applied over the bitten part immediately.</td>
</tr>
<tr>
<td>Mimosa pudica L., Mimosaceae, Dongalamallu</td>
<td>Herb</td>
<td>Roots</td>
<td>Roots ground with the of <em>Mucuna puriens</em> Baker along with water and given orally 2 spoonfuls twice a day for 15 days.</td>
</tr>
<tr>
<td>Momordica charantia L., Cucurbitaceae, Kakarakaya</td>
<td>Climber</td>
<td>Whole plant</td>
<td>Two pills prepared from whole plant along with leave of <em>Azadirachta indica</em> are administered twice a day for 10 days.</td>
</tr>
<tr>
<td>Rauvolia serpentina (L.)Benth., Apocynaceae, Sarpagandha</td>
<td>Herb</td>
<td>Roots</td>
<td>Roots crushed with the leaves of <em>Kalanchoe pinnata</em> (Lam.) Pers. and extract given orally and applied over the bitten spot.</td>
</tr>
<tr>
<td>Strychnos nux-vomica L., Loganiaceae, Mushidi</td>
<td>Tree</td>
<td>Seeds</td>
<td>Decoction from seeds crushed with black pepper and administered 2-3 spoonfuls twice a day for 45 days.</td>
</tr>
<tr>
<td>Tiliacora acumunata (Lam.) Miers., Menispermaceae, Tiga mushini</td>
<td>Climber</td>
<td>Roots</td>
<td>Root powder given orally along with water immediately after the bite.</td>
</tr>
<tr>
<td>Vitex negundo L., Verbenaceae, Vavili</td>
<td>Shrub</td>
<td>Roots</td>
<td>Root paste is made into peanut sized pills and 2 pills administered orally twice a day till cure. 50 mL of root powder decoction given before breakfast for 7 days.</td>
</tr>
<tr>
<td>Withania somnifera (L.) Dunal, Solanaceae, Aswagandha</td>
<td>Herb</td>
<td>Roots</td>
<td>and <em>Withania somnifera</em> (L.) Dunal are mostly used for this purpose by the local tribes of Kotia hills.</td>
</tr>
</tbody>
</table>

Asteraceae, Euphorbiaceae, Convulvulaceae, Cucurbitaceae, Lamiaeae, Menispermaceae, Verbenaceae and Solanaceae. Among all species, herbs were found to be more (6 species), followed by trees and climbers (4 species each) and shrubs (3 species). Of all plant parts sampled, roots found to be more (10 species), seeds (3 species) and one species each for stem bark, leaves, whole plant and aerial part.

The ethnomedicinal survey on snake bite indicated that the study area is rich in medicinal plants and certain species like *Eclipta prostrata* (L.) L., *Hemidesmus indicus* (L.) R. Br., *Jatropha curcas* L., *Mimosa pudica* L., *Rauvolia serpentina* (L.) Benth., *Strychnos nux-vomica* L., *Vitex negundo* L. and *Withania somnifera* (L.) Dunal are mostly used for this purpose by the local tribes of Kotia hills.

*Eclipta prostrata* has been highly regarded as snake bite antidote through its distribution from the southern United States to South America. *Aristolochia* species have been found to inactivate *Naja naja* venom and reduce the clotting time of blood plasma when pre-incubated with the venom. A glycoprotein inhibitor was isolated from *Withania somnifera* which acts against cobra venom and *Hemidesmus indicus* displayed inhibitory activity against viper venom. Aqueous extracts of *Vitex negundo* and *Mimosa pudica* neutralized the venom lethality of *Viper*. 
In Indian folklore, it was a belief that brushing the teeth daily with the stick of Tephrosia purpurea Pers.\textsuperscript{21} and Azadirachta indica A. Juss.\textsuperscript{22} make the body resistant against snake venom. Recent efforts have been made to elucidate the efficacy of herbal remedies that are used to treat snake bites\textsuperscript{2}. Traditional herbal medicine used for the snake bite by tribes of South Surguja, Chhattisgarh\textsuperscript{23}, 51 plant species in Malayali Tribes of Salem district, Tamil Nadu\textsuperscript{24}, 25 plants in the tribes of Raigad district of Maharashtra\textsuperscript{25} and 23 medicinal plants in Sugali tribes of Yerramalais of Kurnool district, Andhra Pradesh\textsuperscript{26}. Therefore, attention should also be made on proper exploitation and utilization of these medicinal plants reported from kotia hills of Vizianagaram district, Andhra Pradesh, for future generations.

**Conclusion**

In order to conserve these useful medicinal plant species, there is a need to actively involve the acquiescence of local people in evaluation, planning, implementation and monitoring processes. Documentation of these medicinal plants against snakebite shows that these local people are still dependent on local vegetation for their life care. These plants recorded as antidotes for snake venoms in the Kotia hills region are needed further phytochemical and pharmacological screening for their active principles and clinical trails.

**References**


