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Ethnoveterinary Applications of Medicinal Plants by Traditional Herbal Healers in Reang Tribeo South District Tripura, India

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Abstract

The present study was carried out in two small towns namely Santir Bazar and Julaibari situated within the subdivision of South District Tripura to document the traditionally used ethnomedicinal plants for curing domestic animal ailments prevailing in the locality. Four developmental blocks Bakafa and Jolaibari in the Santir Bazar subdivision and Amarpur and Karbook in the Jatanbari subdivision were selected for the survey. Data were collected through a structured questionnaire and observations were made during the field visit. The Forest Department facilitated the consultation of nine traditional healers along with other village elders. In the present investigation we have reported a total of 37 species of plants belonging to 32 families of 37 genera used by local communities to treat various animal ailments. These include 14 herb species, 9 trees, 7 climbers, 5 shrubs, 1 grass, and 1 epiphyte. The reported plants were used to treat majorly seven ailments viz., cuts and wounds, bone injury, skin infection, eye infection, dysentery, indigestion and constipation. The survey is preliminary in the area and needs further support to cover other areas occupied by tribal communities.

Keywords: Ethnoveterinary medicine; Health care; Disease; Digestion

Introduction

The study of traditional medicine is often a difficult process [1]. Traditional health care systems have been used for over at least two thousand years in the study area [2]. Plant-based traditional medical systems continue to provide the primary method of health care to more than three-quarters of the world's population [3]. Apart from health care, medicinal plants are the most significant source of alternative income for many underprivileged ethnic communities [4]. Ethno botanical studies have documented many plants with significant medicinal properties [5]. These tribal groups living in biodiversity rich areas possess a wealth of knowledge about the utilization and conservation of edible and medicinal plants [6]. Ethno veterinary medicine plays a key role in rural areas [7] where resource-poor livestock farmers have limited access to modern disease prevention, treatment and frequently depend on traditional knowledge to manage animal health problems and to improve productivity. Despite the importance of ethnoveterinary medicine for animal healthcare in most developing countries it has not yet been well documented [8].

Indigenous knowledge of the veterinary health care system acquired by traditional herbal healers is transmitted orally from one generation to another [9]. The traditional knowledge of specialists (Vaidyas) and local healers (who are knowledgeable and experienced in traditional systems of ethnoveterinary practices) is not documented, and is dwindling quickly [10]. Understanding ethnoveterinary practices can lead to their validation and eventually to better animal healthcare provision and enhanced living standards for the rural poor [11,12] yet there is a notable scarcity of studies [13]. The available information on ethnoveterinary medicine piecemeal at best for India in general [14-16]. Tripura possesses an extremely rich bio-diversity, and its degradation could be a threat for the existence of medicinal plants due to increasing levels of deforestation and degradation. The transmission of traditional knowledge to the next generations is also getting limited. The characteristics, sophistication, and validity of ethnoveterinary systems differ greatly among individuals, societies,

and regions. Hence, documentation of ethnoveterinary medicine from regions with rich ethnographic and biodiversity is of great significance. The present effort was put forth to document the traditionally used plants for ethnoveterinary treatments in some tribal areas of South District, Tripura.

Materials and Methods

The present study was carried out in two small town areas (Santir Bazar and Julaibari), in the South District sub-division of Tripura, India. Four development blocks: Bakafa and Jolaibari in the Santir Bazar subdivision and Amarpur and Karbook in the Jatanbari subdivision. These are located between 22°56'N 23°45'E and 91°18'N 91°59'E at an elevation of 26 masl. The Reang tribe is dominant in the area and other major tribes include Uchoi, Jamatia and Debbarma. The climate of the region is mostly warm and is characterized by humid summer and dry cool winter with plenty of rains during July to October. Rainfall is received from the Southwest monsoon which normally breaks in the month of May. Average annual rainfall in the district is about 2000 mm and the temperature ranges from a maximum of 35.23°C and a minimum of 7.43°C.

Data were collected through structured questionnaire after obtaining prior informed consent from all participants and observations were made during the field visits. The information was gathered from the tribal medicine men and people of the tribal community selected

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Received January 06, 2016; **Accepted** February 02, 2016; **Published** February 05, 2016

Citation: Reang I, Goswami S, Pala NA, Kumar M, Bussmann RW (2016) Ethnoveterinary Applications of Medicinal Plants by Traditional Herbal Healers in Reang Tribeo South District Tripura, India. Med Aromat Plants 5: 234. doi:10.4172/2167-0412.1000234

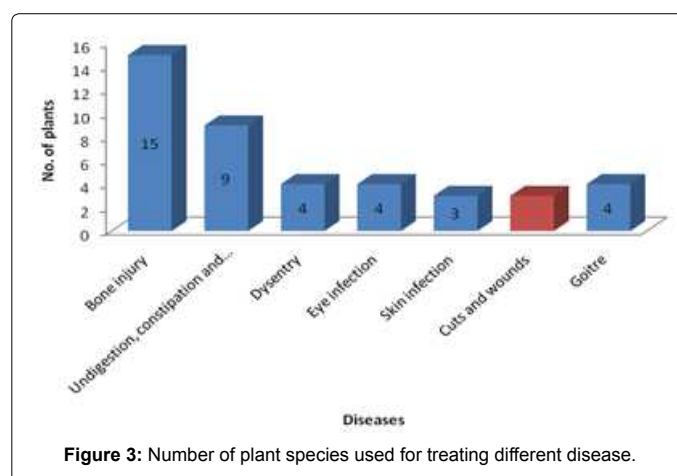
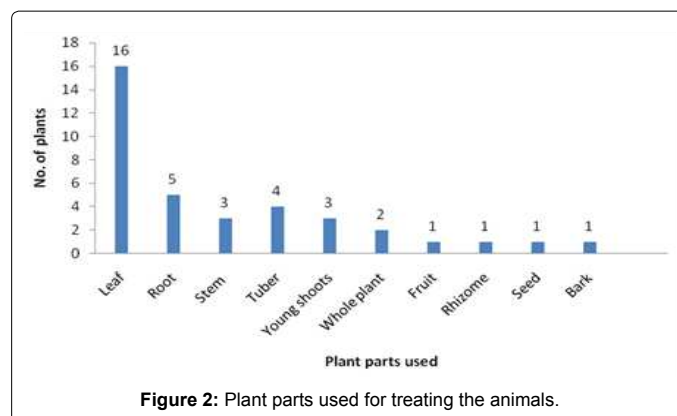
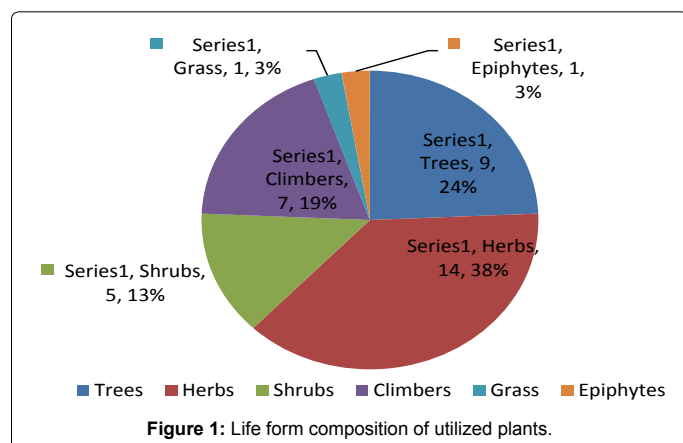
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via snowball sampling who knew well about the surrounding plants, their local names, parts used, preparation in herbal medicine, mode of administration, dosages, and uses in treating various ailments and diseases. The Forest Department facilitated the consultation with nine traditional healers and other elders from the villages and interviews were conducted after obtaining prior oral consent from all participants. The survey was conducted particularly with Tripuri (Reang, Uchoi, and Jamatia) tribes in Gumti (Jatanbari subdivision) and South District (Santir Bazar subdivision) of Tripura with the help of a Forest Range Officer and local medicine men (*bhoidho*, Tripuri), who collect most of the medicinal plants from surrounding vegetation. Specimens were collected and identified by taxonomists in the Tripura University using the regional flora (Flora of Tripura) and herbarium vouchers. The specimens were processed into mounted herbarium sheets following Jain and Rao [17].

Results and Discussion

The medicinal plants collected during the study were used for treating both human as well as animal ailments. In the present survey we have reported 37 species of plants belonging to 32 families and 37 genera used by local communities to treat various animal ailments prevailing in the respective localities. These reported species included 14 herbs, 9 trees, 7 climbers, 5 shrubs, 1 grass, and 1 epiphyte (Figure 1). The twenty plant species out of 37 were grown in wild condition and 16 species were available both in the wild as well as in cultivated conditions. The plant parts like leaves, root, stem, tuber, young shoots, whole plants, fruit, rhizome, seed and bark were used to treat different ailments. Leaves of sixteen plant species are used as medicine and were dominant followed by roots (5 species), tuber (4 species), young shoot (3 species), stem (3 species), whole plant (2 species), and rhizome, seed, bark, and fruit (1 species each) (Figure 2). The traditional knowledge about indigenous ethnomedicine is largely transmitted by oral tradition from generation to generation without any written record. Such practices are still prevalent among rural and tribal communities in many parts of the world. Traditional medicines and habitats from where they can be collected are being depleted rapidly [18,19].

The seven ailments prevailing among the animals were treated with 37 plant species (Table 1). The most common ailments included cuts and wounds, bone injury, skin infection, eye infection, dysentery, indigestion, and constipation. Fifteen species were used for treatment of bone injury followed by nine species each for indigestion, constipation and stomach problems and four species each for dysentery and eye infection (Figure 3).



Bone injury

A paste is produced by mixing and grinding raw egg and katha with the plants like *Acorus calamus*, *Aristolocia tagala*, *Calotropis procera*, *Cajanus cajan*, *Curculigo orchioides*, *Crotalaria pallida*, *Dillenia pentagyna*, *Diplazium esculentum*, *Hoya* spp., *Ichnocarpus frutescens*, *Macaranga* spp., *Microcos paniculata*, *Sterculia villosa*, *Thysanolaena maxima*, and *Vanda roxburghii*. The prepared medicine is then covered with the tender leaf of *Artocarpus heterophyllus* and applied on the injured part and kept for 3 days. Afterwards the injured area is washed with warm water and fresh medicine can be applied. Treatment lasts for at least 2-4 weeks.

Eye infection

The leaves of *Ocimum sanctum*, *Spermacoce ocymoides* and *Pandanus foetidus* needs grinding until the juice could be squeezed out and few drops can be applied to the eyes followed by Juice obtained from the stems of *Smilax* spp. This treatment is used twice a day and results could be seen within a week.

Indigestion and constipation

Achyranthes aspera, *Allium sativum*, *Chlerodendrum fragrans*, *Piper nigrum* and lemon leaf are well grinded and mixed with water of macerated tobacco leaves (cold water extract) to treat indigestion in cows. The rhizome of *Curcuma zedoaria* is fed as a fine paste to the affected animal and results can be seen within a day. *Luffa acutangula*, *Allium sativum* and *Justicia gendarussa* are mixed well and fed with water to the affected animal showing results within 4-6 hours. *Acorus*

S No	Family	Botanical names	Local names	Habit	Parts used
1.	Acanthaceae	<i>Justicia gendarussa</i> Burm. f.	Khumbera	Herb	Leaf
2.	Acoraceae	<i>Acorus calamus</i> L.	Langkhreng	Herb	stem
3.	Amaranthaceae	<i>Achyranthes aspera</i> L.	Ultalengra	Herb	Root
4.	Amaryllidaceae	<i>Allium sativum</i> L.	Rosun kphoih	Herb	Tuber
5.	Apiaceae	<i>Centella asiatica</i> (L.) Urb.	Samsota	Herb	Whole plant
6.	Apocynaceae	<i>Calotropis procera</i> (Aiton) W.T. Aiton	Hangra pata	Shrub	Leaf
7.	Apocynaceae	<i>Catharanthus roseus</i> (L.) G. Don.	Khum boiragi	Herb	Whole plant
8.	Apocynaceae	<i>Hoya</i> spp.	Kaladaru	Climber	Leaf
9.	Apocynaceae	<i>Ichnocarpus frutescens</i> (L.) W.T. Aiton	Nildu	Shrub	Leaf
10.	Aristolochiaceae	<i>Aristolochia tagala</i> Cham.	Nsoi henchi	Climber	Leaf
11.	Asparagaceae	<i>Asparagus racemosus</i> Meisn.	Shaktishara	Herb	Root
12.	Asparagaceae	<i>Dracaena reflexa</i> var. <i>angustifolia</i> Baker	Bloung chanti	Shrub	Root
13.	Asteraceae	<i>Chromolaena odorata</i> (L.) R.M. King. & H. Rob.	Maisnoi	Herb	Leaf
14.	Athyriaceae	<i>Diplazium esculentum</i> (Retz.) Sw.	Moikhandol	Climber	Young shoot
15.	Cucurbitaceae	<i>Luffa acutangula</i> (L.) Roxb.	Jhinga	Climber	Seed/Fruit
16.	Dellineaceae	<i>Dillenia pentagyna</i> Roxb.	Mandul	Tree	Leaf
17.	Euphorbiaceae	<i>Macaranga</i> spp..	Laichauh	Tree	Young shoot
18.	Fabaceae	<i>Albizia procera</i> (Roxb.) Benth.	Khurih	Tree	Bark
19.	Fabaceae	<i>Cajanus cajan</i> (L.) Huth	Bloung khaukhleung	Tree	Leaf
20.	Fabaceae	<i>Crotalaria pallida</i> Aiton	Skamyouthma kakho	Herb	Leaf
21.	Hypoxidaceae	<i>Curculigo orchoides</i> Gaertn.	Lairdom kla	Herb	Tuber
22.	Lamiaceae	<i>Clerodendrum chinense</i> (Osbeck) Mabb.	Chwkhwima	Herb	Root
23.	Lamiaceae	<i>Ocimum sanctum</i> L.	Khumbabauh	Shrub	Leaf
24.	Lauraceae	<i>Cinnamomum glanduliferum</i> (Wall.) Meisn	Bloung tejpatha	Ttree	Root
25.	Lygodiaceae	<i>Lygodium scandens</i> (L.) Sw.	Aichu sinaima	Climber	Leaf
26.	Malvaceae	<i>Bombax ceiba</i> L.	Bochu	Tree	Tuber
27.	Malvaceae	<i>Microcos paniculata</i> L.	Kushnanaliya	Tree	Leaf
28.	Malvaceae	<i>Sterculia villosa</i> Roxb.	Phatchhi	Tree	Tuber
29.	Moraceae	<i>Streblus asper</i> Lour.	Pathar sauna	Tree	Leaf
30.	Orchidaceae	<i>Vanda roxburghii</i> R. Br.	Slan tawgba	Epiphyte	Leaf
31.	Pandanaceae	<i>Pandanus foetidus</i> Roxb.	Tawkha phaukhloi	Herb	Leaf
32.	Piperaceae	<i>Piper longum</i> L.	Gol moris	Climber	Seed/Fruit
33.	Poaceae	<i>Bambusa balcooa</i> Roxb.	Warna blai	Grass	Leaf
34.	Poaceae	<i>Thysanolaena maxima</i> (Roxb.) Kunze	Nouhsi blai	Herb	Young shoot
35.	Rubiaceae	<i>Spermocoe ocymoides</i> Burm. f.	Samgoda	Shrub	Stem
36.	Smilacaceae	<i>Smilax</i> spp.	Moukhra phaikho	Climber	Stem
37.	Zingiberaceae	<i>Curcuma zedoaria</i> (Christm.) Roscoe	Kormo ksom	Herb	Rhizome

Table 1: Description of Ethnoveterinary Plants.

calamus, *Allium sativum*, *Curcuma zedoaria* and *Hoya* spp. are mixed and given to the affected animal thrice a day to treat indigestion and takes almost two days to get normal.

Dysentery

Leaves of *Catharanthus roseus*, *Centella asiatica*, *Streblus aspera*, *Justicia gendarussa*, and *Lygodium scandens* are grinded separately and given to the affected animals thrice a day.

Cuts and wounds

Leaves of *Chromolaena odorata* are grinded into a paste and applied on cuts to stop bleeding. Leaves of *Hoya* spp. and *Ichnocarpus frutescens* are applied if a nerve is injured.

Skin disease

Ash of *Centella asiatica* mixed with Raap is applied on the affected area twice a day. Ash of *Bambusa balcooa* is mixed with coconut oil and applied on the affected area.

Goiter

Achyranthes aspera, *Allium sativum*, *Chlerodendrum fragrans*, *Piper nigrum* and lemon leaf is grinded and mixed with tobacco leaf juice (cold water extracts) and this can be administered in liquid form to cows.

Plant parts used as medicine

Leaf: *Aristolochia tagala*, *Bambusa balcooa*, *Calotropis procera*, *Cajanus cajan*, *Chromolaena odorata*, *Crotalaria pallid*, *Dillenia pentagyna*, *Hoya* sp., *Ichnocarpus frutescens*, *Justicia gendarussa*, *Lygodium scandens*, *Microcos paniculata*, *Ocimum sanctum*, *Pandanus foetidus*, *Streblus asper*, *Vanda roxburghii*.

Root: *Achyranthes aspera*, *Asparagus racemosus*, *Clerodendrum chinense*, *Cinnamomum glanduliferum*, *Dracaena gracilis*.

Tuber: *Allium sativum*, *Bombax ceiba*, *Curculigo orchoides*, *Sterculia villosa*.

Stem: *Spermacoce ocymoides*, *Smilax* sp., *Lygodium scandens*.

Young shoots: *Thysanolaena maxima*, *Mcaranga* sp., *Diplazium esculentum*.

Whole plant: *Centella asiatica*, *Catharanthus roseus*.

Rhizome: *Curcuma zedoaria*.

Bark: *Albizia procera*.

Availability of identified medicinal plants

Available in the wild: *Achyranthes aspera*, *Aristolochia tagala*, *Cajanus cajan*, *Clerodendrum chinense*, *Cinnamomum glanduliferum*, *Chromolaena odorata*, *Crotalaria pallid*, *Curculigo orchioides*, *Dillenia pentagyna*, *Diplazium esculentum*, *Dracaena gracilis*, *Lygodium scandens*, *Ichnocarpus frutescens*, *Mcaranga* spp., *Microcos paniculata*, *Ocimum sanctum*, *Pandanus foetidus*, *Smilax* sp., *Thysanolaena maxima*, *Vanda roxburghii*.

Available both wild and cultivated: *Albizia procera*, *Acorus calamus*, *Asparagus racemosus*, *Bambusa balcooa*, *Bombax ceiba*, *Catharanthus roseus*, *Curcuma zedoaria*, *Centella asiatica*, *Calotropis procera*, *Hoya* spp., *Justicia gendarussa*, *Luffa acutangula*, *Sterculia villosa*, *Spermacoce ocymoides*, *Streblus asper*, *Piper nigrum*.

Available in cultivation only: *Allium sativum*.

Conclusions

Our study suggests that documentation of these medicinal plants and associated indigenous knowledge can be helpful for conservation and sustainable use of medicinal plants in this area and for validation of these plant preparations in veterinary treatment. Intervention of scientific community is need of the hour to improve the health care system of animals with the help of locally available resources. The dependency on herbal treatments for animal health care is due to widespread faith and the unavailability of animal health service for the villages or nearby area.

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Citation: Reang I, Goswami S, Pala NA, Kumar M, Bussmann RW (2016) Ethnoveterinary Applications of Medicinal Plants by Traditional Herbal Healers in Reang Tribeo South District Tripura, India. *Med Aromat Plants* 5: 234. doi:[10.4172/2167-0412.1000234](https://doi.org/10.4172/2167-0412.1000234)

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