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Ethno Medicinal Survey on Herbal Plants Used Against Helminthiasis by the Tribal Medicinal Practitioners of Chitradurga District, Karnataka State, India

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Abstract

Helminthiasis is a macro parasitic disease of humans and other animals in which a part of the body is infected by parasitic worms. The present study recorded the medicinal plant remedies used by local tribal communities of Chitradurga district, Karnataka state, India for curing helminthiasis. The Ethno medicinal information for curing helminthiasis was obtained from herbal practitioners, elderly men and women in the villages by semi structured questionnaires through frequent field visits and interviews. A total of 22 medicinal plant species belonging to 19 families have been used by the tribal practitioners. In the current survey, 11 important species were recorded. The outcome of the study may provide a scope to reveal data of medicinal herbs prescribed by herbal practitioners for treating helminthiasis and update the status of the respective herbal population in the study area and provide appropriate conservation measures for preservation and utilization of these medicinal plants by local herbal practitioners and related people.

Keywords

Chitradurga, Ethnomedicinal, Helminthiasis, Medicinal Plants, Tribal Practitioners

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1. Introduction

Helminthiasis (helminthosis), also known as helminth infection or worm infection, is a macro parasitic disease of humans and animals. Tapeworms, flukes and roundworms are the major types commonly found in the gastrointestinal tract and move to other organs as well to cause physiological injury. It's a global level issue and many incidences are recorded due to frequent world travel and immigration. Helminthiasis infestations lead to malnutrion, anemia, eopsinophilia and pneumonia despite they remain the major cause for the wildlife diseases and the economic crises in the livestock industry including the human socio-economic problems in developing countries [1]. The tribal and rural people of various parts of India are highly depending on medicinal plants to meet their daily requirements, for earning their livelihood using local and herbal medicines that cure various disorders. This is attracting the attention of several botanists and plant scientists who directing the vigorous researches towards the discovery and rediscovery of several medicinal plants along with their medicinal remedies for various diseases. Applications of the plant *Butea monosperma* (Lam.) seeds used by traditional medicine practitioners to cure worm infections was reported under an ethnomedical survey of 7 medicinal plants in Mali, West

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Africa [2]. Studies on anthelmintic activity of medicinal plants used against intestinal helminthiasis found to have active compounds from *Sclerocarya birrea*, *Aframomum alboviolaceum*. *Pericopsis laxiflora*, *Vitellaria paradoxa* and *Hibiscus asper*. Based on the findings it is imperative that the traditional uses of some of the studied plants in the treatment of intestinal helminthosis and the vigor plant species could be a probable source of novel lead for anti-helminthic compounds [3]. Therefore, the present study was aimed to conduct an ethno medicinal survey, authentication, data documentation and to study the medicinal plant remedies used by local tribal communities of Chitradurga district for curing helminthiasis. This would be useful in understanding the traditional knowledge practices and family secret based approaches in curing helminthiasis and the related diseases.

2. Materials and Methods

2.1. Study Area

Chitradurga District of Karnataka State, India lies between latitude 13 034' to 15 0 02' N and longitude 76 001' to 77 0 01' E. (Figure 1) Temperature 37 C (Max) 15 C (Min). Average Rainfall 744 mm. Major soil types are deep and shallow black soil, Mixed red and black soil, red loamy and sandy soil. The terrain is not uniform and is characterized by vast stretches of undulating plains with intermittent parallel chains of hills. The district is having mixed and dry deciduous forests.

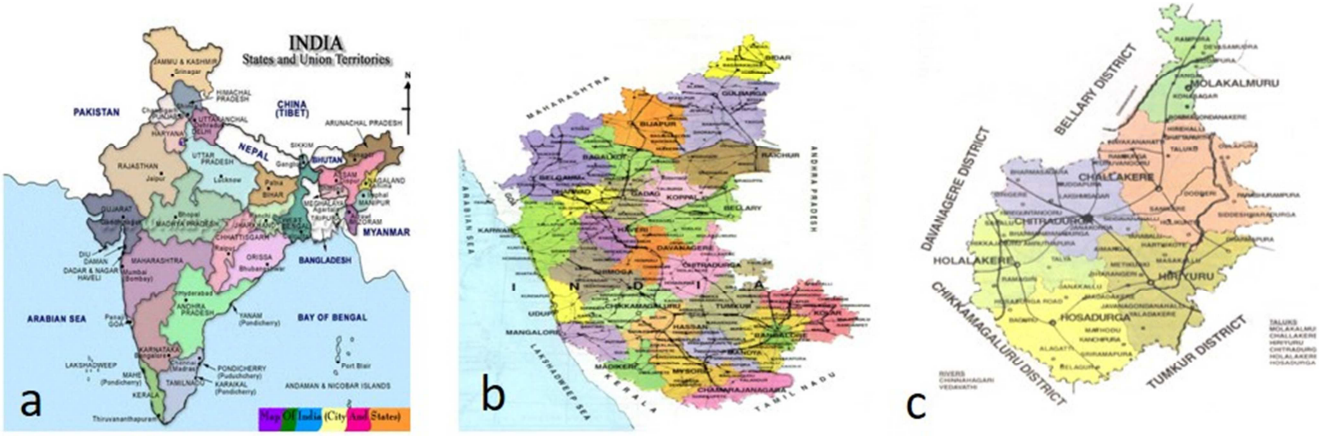

Figure 1. Study area showing the a) map of India, b) Karnataka State and c) Chitradurga District including six taluks.

2.2. Data Collection

Frequent field trips were undertaken to different places of all the six taluks of Chitradurga District during November 2014 to April 2015. secret practitioners, tribes like elava, golla, naik, nayaka, elderly men and women in the villages using semi structured questionnaires as describe by Shosan and Mariangela Napoli [4]. Collected medicinal plant materials under investigation were subjected for ethno medicinal information that are used to cure helminthiasis as per the methods followed by herbal practitioners. The collected plant specimens used for treating helminthiasis were identified and authenticated based on the Flora of Madras Presidency [5]. The plant specimens and different parts are preserved in the form of herbarium [6, 7]. The herbarium sheets and the collected raw drug materials were stored and maintained in the Department of Botany, I.D.S.G. Govt. College, Chikmagalur-577102, Karnataka state, India. The herbarium sheets with dried plant shoot materials containing flower buds and flowers, fruits and seeds are maintained, preserved in-situ in herbarium room and regularly monitored for any pathogen attack. The herbarium materials are sprayed with 70% formalin followed by 70% ethanol and dried.

3. Results and Discussion

During the present investigation, a database of total 22 medicinal plant species belonging to 19 families, have been collected, identified, authenticated, listed, categorized and analyzed (Table 1). The plant extracts are used as medicines in the form of juice, powder, decoction, paste, tablets and also in combination with other plant parts as prescribed by traditional practitioners, family secret practitioners, elderly men and women in the villages.

Similar studies were conducted earlier [2] where Ethno pharmacological survey of different uses of seven medicinal plants from Mali, (West Africa) in the regions Doila, Kolokani etc. Other workers have also reported the plants like anthelmintic activity of medicinal plants used against intestinal helminthiasis in ten economically important medicinal herbs [8-10]. Helminths are found to be most wide spread parasites in human and the traditional medicinal cure is widely preferred by local people in the villages under herbal practitioners and practice home-made herbal preparations especially for who do not have access to

allopathic medicines and require alternative medicines which are readily formulated, prepared and easily available within their reach in the tribal forest area. Presently, the traditional knowledge and herbal practices are not very commonly followed among the tribal people, not practiced in family in the generations together as well. Also, the global warming reduced the normal life and living environment in the tribal forests including the trigger pertaining to certain environmentally induced vulnerable herbal population. Based on certain clinical trial the herbal drug for parasite "Ayush-64" which has mixture of four herbs like *Piccorhiza kurroa*, *Alstonia scholaris*, *Swertia chirata*, *Caesalpenia bonducella* was found to be good in the initial parasite clearance while relapsed in many cases after 3 weeks [10]. During the field studies, it was noticed that the occurrence and distribution of some documented plants have become rare and to be endangered in future. The medicinal plants which are found to be

Table 1. Medicinal plants used against helminthiasis by different tribes of Chitradurga district.

No.	Botanical name/ Family	Local name	Parts used/Formulations
1.	*Ailanthus excelsa* Roxb. / Simaroubaceae	Hebbevu	Stem bark is grind in luke warm water and the extract is given orally three times a day for five days.
2.	*Alstonia scholaris* (L.) R. Br.*/ Apocynaceae	Maddale	Stem bark is soaked in water for overnight; the water is given with ginger juice orally.
3.	*Aristolochia indica* L.*/ Aristolochiaceae	Eshwari balli	100 gms of roots are ground well and decoction is made by adding triphala churna and given orally for week.
4.	*Artemisia nilagirica* (C. B. Clarke)/ Asteraceae	Manchapatre	100gms of manchpatre leaves and 50 gms of neem bark are grind,
5.	*Azadirachta indica* A. Juss/ Meliaceae	Bevina mara	decoction is made given orally twice a day for 7days.
6.	*Bambusa arundinaceaea* (Retz.) Roxb. / Poaceae	Bidiru	Tender shoots are grind with lemon juice and it is given thrice a day.
7.	*Barringtonia acutangula* (L.) */ Lecythidaceae	Neeru ganagalu	150 gms of Root and 50 gms of Eshwari balli are boiled in one litre of water until it becomes half; it is taken for five days.
8.	*Boerhavia diffusa* L./ Nyctaginaceae	Komme gida	Roots are crushed, soaked in water for 4-5 hours, filtered extract is mixed with few drops of neem oil and it is taken orally for three days.
9.	*Butea monosperma* (Lam.) Taubert/ Papilionaceae	Muttuga	50 grams of seeds are roasted, powdered mixed with garlic and jaggery made into small tablets, taken orally twice a day for one week.
10.	*Carica papaya* L./ Caricaceae	Pappaya	Dried milky latex and seeds are grind to make tablets and coated with ghee given thrice a day for five days.
11.	*Cassia mimosoides* L.*/ Caesalpianiaceae	Nelatangadi	Hand full of leaves are boiled in water by adding kamkasuri and till oil and the filtrate is given twice a day.
12.	*Citrus medica* L.*/ Rutaceae	Madala	Fruits are cut and smashed, filtered and mixed with tricatu churna and given orally.
13.	*Crinum defixum* Ker-Gawler*/ Liliaceae	Visha mungali	100 gms of Visha mungali roots, 50gms of garuga leaves are grind and dried in shade. The churna is used along with luke warm water for a week.
14.	*Eclipta alba* (L.) Hassk. / Asteraceae	Garuga	Ten ml of leaf juice is orally used twice a day.
15.	*Embelia ribes* N. Burman*/ Myrsinaceae	Vayu vidanga	Seeds are grind to make churna, it is taken with milk.
16.	*Ficus religiosa* L./ Moraceae	Arali mara	Usage of leaf extract gives good result against helminthiasis.
17	*Hollarrhena antidysenterica* (Roth) A.D C. / Apocynaceae	Kodasige	Kodasige seeds are roasted and powdered, mixed with Ingalarada
18	*Balanites aegyptiaca* auct.non (L.) Delile*/ Simaroubaceae	Ingalarada mara	Gum. Tablets made by this are given in the night for seven days.
19	*Swertia chirayita* (Roxb.ex Flem.)*/ Gentianaceae	Chirayita/ Nelabevu	Whole plant decoction given twice a day.
20	*Jasminum grandiflorum* Bailey/ Oleaceae	Jajimallige	Tender leaf paste is made by adding wild turmeric it is taken for 7 days.
21	*Pogostemon patchouli* Hook f.non Pelletier*/ Lamiaceae	Pacchetene	Leaf juice is orally taken for 5days to get relief from disease symptoms.

*plants found to be endangered in the study area.

endangered from the list of plants surveyed (Table 1) are Alstonia scholaris, Aristolochia indica, Barringtonia acutangula, Cassia mimosoides, Citrus medica, Crinum defixum, Embelia ribes, Balanites aegyptiaca, Swertia chirayita, Pogostemon patchouli. Merli L W and Benjamin G [10] reported the list of 5 endangered species, 13 vulnerable and 3 nearly threatened species related to herbs used for malaria parasite treatment. They also emphasized that these plant species have insecticidal and molluscicidal properties.

Therefore, these rare and vulnerable plant species should be protected by forest act and the species population could be balanced by reintroducing the tissue cultured plants through biotechnological methods like micro propagation and cryopreservation as well. Besides, special awareness programmes should be conducted to the tribal community, herbal practitioners and general public by NGOs and government agencies regarding conservation, medicinal plant cultivation by farmers with subsidies and germplasm preservation project through various media viz. radio, television, print media etc. As suggested by Payel Sen Choudhury (2011) [11] such types of programmes and

communication are known as development communication. It can thus be said to be an approach to communication which provides communities with information they can use in bettering their lives. Development communication has two primary roles, i.e. transforming role, as it steps social change in the direction of the hygiene taste of today's generation in this competitive market and a socializing role by seeking to maintain some of the established values of the society. Media plays an important role in development communication through circulation of knowledge, providing forum for discussion of issues, teach ideas, skills for a better life and create a base of consensus for stability of the state [11].

According to UN regulations natural resource aspects of sustainable development in India and agenda 21, the conservation and sustainable use of biological resources based on local knowledge systems and practices is ingrained in Indian ethos and way of life. Formal policies and programmes for conservation and sustainable use of biodiversity resources date back several decades. The concept of environmental protection is enshrined in the Indian Constitution in Article 48(a) and 51(g). (http://www.un.org/esa/agenda21).

4. Conclusions

The tribal people of study area live in remote areas largely depend upon the local plant resources to meet their daily requirements and cure various diseases. The most of the reported species used for the preparations of medicines are wild. This study reveals that medicinal plants still play a vital role in the primary health care of the tribal people in anti-parasitic disease cure. Our ethno medicinal data may provide a base to explore new compounds related to chemical, pharmacological, clinical and biochemical investigations, which may yield potential drug for helminthes and other parasites. To conclude, screening of active principles, pharmacological values and anthelmintic activity against helminthiasis and the conditions that cause the organism, should be studied invitro and clinically tested. The results supported the traditional uses of some of the tested plants in the treatment of intestinal helminthiasis with highlights on the list of endangered species in the study area. Suggested development programmes on various state, national and UN regulations would add awareness among the public including tribal herbal practioners which would reduce the vulnerable and endangered plants misuse and create preparedness of control measures.

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