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Traditional Knowledge on Ethnomedicinal Plants Used for Curing Leprosy in Raniganj Coalfield Area of West Bengal



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Abstract

An ethnomedicinal exploration was conducted in various collieries of Raniganj coalfield area in West Bengal and the valuable data on the uses of native medicinal plants were collected. In this study indigenous knowledge related with ethnomedicinal plants used by tribals and local people were noted. Many plants were reported to cure leprosy apart from other diseases cured. The use of plants, plant parts has been discussed. This investigation was an attempt to systematically enumerate and document the use of ethnomedicinal plants especially for the cure of leprosy.

Keywords: Ethnomedicinal, Raniganj, West Bengal, Leprosy.

Introduction

Plants have been used in traditional medicine for many centuries. India has more than three thousand years of medicinal heritage based on medicinal plants which are largely used as folk medicine or preparation of recent pharmaceuticals¹. Raniganj coalfield area has a peculiar assemblage of ethnomedicinal plants. Nature has made it one of the richest regions of the Earth and among its various natural endowments vegetation is one of the most important bioresource. The native people of this region are acquainted with the uses of ethnomedicinal plants growing in the surrounding coalfield area. Raniganj is situated on the western part of Burdwan district of West Bengal. It lies on exposed Gondwana rocks and consists of undulating laterite soil. The different tribes found in this area are Santhals as dominant besides Mahi, Mali, Modikor, Munda, Parhaya, Ho and Bhumjis, etc. It is surrounded by hills of Chotanagpur, districts of Bankura, Purulia and Birbhum. It is a coal mining, industrial town and one of the most important coalfield regions of Eastern India. Coal in India was first mined in Naryankumari near Raniganj². This area lies in the Damodar Valley region surrounded by Durgapur-Asansol industrial belt. The area has a humid mesothermal type of climate. Leprosy is one of the oldest diseases known to man. Despite advances in all spheres of medical science, leprosy continues to be a public health challenge in countries like India. In rural parts of India it is considered to be an incurable disease which has resulted in severe stigmatization³. Leprosy has afflicted humanity since time immemorial. It once affected every continent and it has left behind a terrifying image in history and human memory of mutilation, rejection and exclusion from society. Leprosy has struck fear into human beings for thousands of years, and was well recognized in the oldest civilizations of China, Egypt and India. However, treatment for leprosy only appeared in the late 1940s with the introduction of dapsone, and its derivatives. Leprosy bacilli resistant to dapsone gradually appeared and became widespread. Leprosy also known as Hansens disease is a chronic infectious disease that affects the skin, peripheral nerves, upper respiratory tract and eyes⁴. This disease is caused by *Mycobacterium leprae* which is a slow growing, acid fast bacteria. When *Mycobacterium leprae* was discovered by G.A. Hansen in 1873, it was the first bacterium to be identified as causing disease in man. This bacteria which are rod shaped (bacilli) are transmitted either by inhalation or by direct contact in to an open wound from an infected individual⁵. However, leprosy is actually not that contagious. One can catch it only if a person comes into close and repeated contact with nose and mouth droplets from someone with untreated leprosy. Children are more likely to get leprosy than adults. The

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main symptoms of leprosy are loss of temperature sensation, needles sensation, disfiguring pale colored skin sores and lumps that do not go away after several weeks or months. Nerve damage can lead to muscle weakness and loss of feeling in arms and legs⁶. It usually takes about three to five years for symptoms to appear after coming into contact with the leprosy causing bacteria. Some people do not develop symptoms until twenty years later. Leprosy's long incubation period makes it very difficult for doctors to determine when and where a person with leprosy got infected⁷.

Review of Literature

According to World Health Organization (WHO), about 180,000 people worldwide are infected with leprosy and most of them are in Africa and Asia. About hundred people are diagnosed with leprosy in the U.S. every year, mostly in the South, California, Hawaii, and some other U.S. territories. The WHO launched a 5-year "Global leprosy strategy 2016–2020" in April 2016 titled 'accelerating towards a leprosy-free world'. This was built on the earlier five year strategy 2011–2015 that focused on early leprosy detection to reduce disabilities. The document states that the agenda of eliminating leprosy at the sub national level is still unfinished in many countries and will therefore continue to be pursued in the coming years. Other challenges are continued delay in detecting new patients, persisting discrimination against people affected by leprosy, and limited impact on transmission of leprosy⁸. The SPARSH Leprosy Awareness Campaign (SLAC) was launched on 30th January 2017 and is a program intended to promote awareness and address the issues of stigma and discrimination⁹. In India, the National Leprosy Eradication Programme (NLEP) is the centrally sponsored health scheme of the Ministry of Health and Family Welfare, Government of India. While the NLEP strategies and plans are formulated centrally, the programme is implemented by states and union territories. The programme is also supported by WHO, International Federation of Antileprosy Associations (ILEP), and few NGOs¹⁰. Despite the above successes, the fact remains that India continues to account for 60% of new cases reported globally each year and is among the 22 "global priority countries" that contribute 95% of world numbers of leprosy warranting a sustained effort to bring the numbers down. In the year 2007, new cases detected in India were 137,685, and nine years later in 2016, the number remained almost the same at 135,485¹¹. Panda et al. (2016) reported some plants having therapeutic use against leprosy in Bhadrak district of Orissa¹². Jhonsy and Kaviyaran (2015) reported fifty one plant species used for the treatment of leprosy in tribal peoples of Kanyakumari district of TamilNadu¹³. Tripathi et al. (2013) documented forty five species of medicinal plants used in traditional health care system of which some were found to be used against leprosy in South West Bengal¹⁴. Kingston et al. (2009) also reported about indigenous knowledge of using medicinal plants in treating skin diseases including leprosy in Kanyakumari district of Southern India¹⁵.

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Objective of the Study

To document the traditional knowledge of tribals of Raniganj coalfield area about the usefulness of various ethnomedicinal plants towards curing leprosy. The study on such plants of ethnobotanical importance may help in getting some effective medicine for leprosy at nominal rate which can be easily affordable for the common man.

Materials and Methods

In order to assess the use of ethnomedicinal plants by tribals systematic field survey was conducted in tribal localities and collieries of Sriduli, Bansra, Satgram, Kunustoria and Siarsol collieries in Raniganj coalfield region of West Bengal from October 2015 to November 2016. This coalfield area is a part of Eastern Coalfields. Raniganj is bounded by latitude 23° 55' N and longitude 86° 45' E to 87° 20' E. The tribal areas were visited in different seasons to avail most of the plant materials in abundance and in their flowering condition. The information about medicinal uses of the plants were gathered on the basis of interview with traditional medicinal practitioners, local people and experienced old rural folks belonging to different tribal communities in different collieries. In the present study, safety considerations were properly maintained and abundant plants were recorded. Herbarium specimens and photographs were identified by taxonomists and stored for future use. The ethnomedicinal plants used for cure against leprosy was confirmed by experienced tribal medicinal practitioners and tribal volunteers. The queries were done by the authors to indigenous community as suggested by Jain (1964); Martin (1995) and Maundu (1995) for carrying out systematic study in ethnobotanical investigations^{16,17,18}. The views of medicine men and informants on Prior Informed Consent (PIC) and intellectual property rights (IPR) were taken on traditional knowledge and practices. They had agreed that their knowledge can be used for research and academic purposes for the welfare of the humanity. No conflict of interest was observed in this ethnobotanical study. Information about the medicinal plants and their uses has been collected from authentic tribal medicinal practitioners and by consulting them repeatedly. In case information differed from experts to experts, rule of maximum was applied. Regular visits to patients regarding information about recovery were noted; 55% -60% positive answers were taken as confirmed. Information on medicinal plants, local name, plant parts used and mode of administration for curing leprosy were recorded.

Results and Discussion

Raniganj coalfield area is rich in ethnomedicinal knowledge which is being transmitted from one generation to another in verbal form. Most of the tribal people interviewed had no formal education. They had inherited the knowledge from their ancestors. Informants were chosen on the basis of their efficiency to identify a particular plant in situ and their basic knowledge of ethnomedicine. Both individual and group interviews were taken to get significant information regarding ethnomedicinal use

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of plants. This vital knowledge needs to be scientifically and systematically documented before it is lost due to rapid changes in the community on account of attaining modern civilization by the tribals and other local peoples of Raniganj coalfield area. The important factor for such change is consumption of allopathic medicines and migration of youth from tribal areas to urban areas for employment. The importance of recording this traditional knowledge becomes indispensable in view of rapid socio economic and cultural changes and for high technique low cost solution¹⁹. It was also noted in the study that the traditional medicinal practitioners were afraid of the extinction of some important ethnomedicinal plants to cure leprosy due to anthropogenic activities like rapid increase in human population and biotic interference, etc. A special mortar and pestle made of stone or wood are used by them for preparing these ethnomedicines. The dosage and duration of the drugs vary from one herbal healer to another herbal healer. However, they strictly follow the collection time of plant materials, drying, storage techniques and method of preparation. In modern system of medicine

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antibiotics are used to treat the different types of leprosy infection. Long-term treatment with two or more antibiotics is recommended, usually from six months to a year. However, antibiotics cannot treat the nerve damage. Anti-inflammatory drugs are used to control nerve pain and damage related to leprosy. This may include steroids, such as prednisone which have side effects in long term. Medical researchers are still investigating the route of transmission of leprosy. It is not hereditary but recent genetic studies have shown that about seven genes are associated with an increased susceptibility to leprosy and so it may be partially inheritable. People who live with untreated leprosy patients are about eight times more likely to develop the disease. Prevention of contact with droplets from nasal and other secretions from patients is currently the most effective way to avoid the disease²⁰. In this survey forty six ethnomedicinal plants were recorded which have the potential to cure leprosy of which nine were monocotyledons and thirty seven were dicotyledons. The following plant species were identified for their use against leprosy in Raniganj coalfield area.(Table1).

Table1. List of Ethnomedicinal Plants Used to Cure Leprosy in Raniganj Coalfield Area

S.N.	Botanical Name	Family	Local Name/ Santhali Name	Uses
1.	<i>Abrus precatorius</i> L.	Fabaceae	Kawet	The extract of the seeds is used to cure white leprosy.
2.	<i>Abutilon indicum</i> (L.)Sw.	Malvaceae	Mirubaha	The extract of the roots is taken orally with hot water.
3.	<i>Ageratum conyzoides</i> L.	Asteraceae	Dochunti	The extract of the leaves is applied on affected areas of the skin.
4.	<i>Alocasia indica</i> (Roxb.)Schott.	Araceae	Manakachu	The extract of the rootstock is used.
5.	<i>Amaranthus spinosus</i> L.	Amaranthaceae	Janum arak	The juice of the whole plant is used.
6.	<i>Anacardium occidentale</i> L.	Anacardiaceae	Hijlibadam	The powder of the bark is made into a paste and applied externally.
7.	<i>Andrographis paniculata</i> (Burm. f.)Wall ex Nees	Acanthaceae	Chirayta	Paste made from leaf is applied topically.
8.	<i>Argemone mexicana</i> L.	Papaveraceae	Gokhula janum	Seed paste is applied.
9.	<i>Asparagus racemosus</i> Willd.	Liliaceae	Satwar	The root decoction is mixed with honey and cow's milk and taken orally till cure.
10.	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Nim	The bark is powdered and seed oil is used till cure.
11.	<i>Boerhaavia diffusa</i> L.	Nyctaginaceae	Punarnova/Khapra ara	The root is dried, crushed to form powder which is applied on affected areas.
12.	<i>Caesalpinia bonduc</i> (L.)Roxb.	Caesalpinaceae	Bagni	Dried root powder is used.
13.	<i>Cajanus cajan</i> (L.) Huth.	Fabaceae	Rahar	The juice of the leaves is applied.
14.	<i>Cassia fistula</i> L.	Caesalpinaceae	Nuruic	Dried root powder and juice of the fruits is applied.
15.	<i>Cassia tora</i> L.	Caesalpinaceae	Chakunda	The extract of the leaves and seeds is applied.
16.	<i>Centella asiatica</i> (L.) Urban	Apiaceae	Thankuni	Fresh juice from the leaf is useful in curing the disease.
17.	<i>Clerodendrum indicum</i> (L.) O. Kuntze	Verbenaceae	Nargi	The root bark is boiled, filtered and the extract is

				used to treat leprosy.
18.	<i>Clerodendrum viscosum</i> Vent.	Euphorbiaceae	Ghentu/Kharbari	Root bark is boiled in Karanj oil with garlic and applied as ointment.
19.	<i>Coccinia grandis</i> (L.) Voigt	Cucurbitaceae	Telakucha	The juice of the fruits is used.
20.	<i>Commelina benghalensis</i> L.	Commelinaceae	Kana arak	The extract of the whole plant is used.
21.	<i>Cymbopogon citrates</i> Stapf.	Poaceae	Gandhabena	The extract of the grass and roots is used together.
22.	<i>Cyperus rotundus</i> L.	Poaceae	Tandi	Fresh juice of the roots is applied.
23.	<i>Dalbergia sissoo</i> Roxb.	Fabaceae	Sisoo	The powder of bark is used.
24.	<i>Dioscorea alata</i> L.	Dioscoreaceae	Chupri alu	The extract of the tubers is useful.
25.	<i>Emblica officinalis</i> Gaertn.	Euphorbiaceae	Meral	The juice of the fruits is applied.
26.	<i>Euphorbia tirucalli</i> L.	Euphorbiaceae	Siju	The juice of the whole plant is used.
27.	<i>Gloriosa superba</i> L.	Liliaceae	Siric samano	The extract of the tubers is used.
28.	<i>Hiptage benghalensis</i> Kurz.	Malpighiaceae	Basanti	The leaf extract is applied on the wounds.
29.	<i>Holarrhena pubescens</i> (Buch.-Ham) Wall. Ex G. Don.	Apocynaceae	Kurchi	The extract of the root is applied.
30.	<i>Ipomoea aquatica</i> Forssk.	Convolvulaceae	Kalmi shak	The extract of the whole plant is used.
31.	<i>Kaempferia galangal</i> L.	Zingiberaceae	Ekangi	The extract of the rhizomes and leaves are applied.
32.	<i>Lawsonia inermis</i> L.	Lythraceae	Mehendi/Henna	The bark powder and juice of the flowering twigs are used.
33.	<i>Luffa cylindrical</i> (L.) M. Roem.	Cucurbitaceae	Purul	The juice of the fruit is used.
34.	<i>Mimosa pudica</i> L.	Mimosaceae	Lajjabati	The paste of the roots is applied.
35.	<i>Nelumbo nucifera</i> Gaertn.	Nelumbonaceae	Padma/Kamal	The powder of the seeds is used.
36.	<i>Nerium odorum</i> Soland.	Apocynaceae	Rajbaka	The root bark oil is applied to treat leprosy.
37.	<i>Ocimum sanctum</i> L.	Lamiaceae	Tulsi	Leaf paste is used for treating wounds of leprosy.
38.	<i>Pergularia daemia</i> (Forssk.) Chiov.	Asclepiadaceae	Chagalbati	The extract of the whole plant is used.
39.	<i>Piper betle</i> L.	Piperaceae	Pan/Tambul	The extract of the whole plant is prescribed orally.
40.	<i>Plumbago zeylanica</i> L.	Plumbaginaceae	Chitrak	The extract of the roots is applied.
41.	<i>Pterospermum acerifolium</i> Willd.	Sterculiaceae	Kanakchampa	The extract of the flowers is useful.
42.	<i>Pterospermum canescens</i> Roxb.	Sterculiaceae	Muchkunda	The extract of the flowers is used on wounds.
43.	<i>Pueraria tuberosa</i> DC.	Fabaceae	Tirra	The juice of the tuberous root is used.
44.	<i>Semecarpus anacardium</i> L.	Anacardiaceae	Soso	The powder of the nuts is used.
45.	<i>Tectona grandis</i> L.	Verbenaceae	Segun	The extract of the flowers and bark is used.
46.	<i>Vitex negundo</i> L.	Verbenaceae	Sinduari	The leaf juice is applied to treat leprosy.

Conclusion

Raniganj coalfield area of West Bengal sustains a very rich medicinal plant wealth. The ethnobotanical study revealed the uses of

ethnomedicinal plants for the cure of leprosy. The trend of increasing resistant pathogenic microbes has induced the search for safer and natural medicines. The data collected in the above exploration can be

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used for pharmacological research for the discovery of new phytomedicines. The mode of preparation and administration of ethnomedicines are easy without any reported side effects. The valuable information gathered should be propagated among the people so that it may bear a scientific meaning. However, clinical and pharmacological traits would support the efficacy of the ethnomedicinal plants. Steps should be taken for the conservation of these important ethnomedicinal plant species of Raniganj coalfield area like cultivation of rare medicinal plants, provision of training to traditional medicinal practitioners and establishment of medicinal plant gardens, etc to protect the genetic biodiversity. Thus, traditional medicines have the potential to form the basis of pharmaceutical drugs for the treatment of leprosy.

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Endnotes

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