MEDICINAL PLANTS OF A SANTAL TRIBAL HEALER IN DINAJPUR DISTRICT, BANGLADESH


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ABSTRACT

Background. The Santals are one of the largest tribes residing in the northern districts of Bangladesh. The objective of this study was to document the ethnomedicinal practices of a tribal healer of the Santal tribe residing in Dinajpur district, Bangladesh. Methods. Interviews of the Santal healer were carried out with the help of a semi-structured questionnaire and the guided field-walk method. Results. Altogether 16 plants distributed into 14 families were observed to be used by the Santal healer. These plants were used for treatment of diabetes, cuts and wounds, fever, respiratory tract disorders, skin disorders, bone fracture, sprain, physical weakness, gastrointestinal disorders, leucorrhea, spermatorrhea, and pain. Conclusion. The plants used by the Santal healer adds to the ethnomedicinal uses of various plants in Bangladesh and provides an opportunity to scientists to conduct pharmacological activity studies on the plants towards discover of new drugs.

KEY WORDS: Santal, Dinajpur, Bangladesh, ethnomedicine.

INTRODUCTION

The Santals are the largest tribal group inhabiting the northern districts of Joypurhat, Rajshahi, Thakurgaon, Dinajpur and Rangpur in Bangladesh. They are considered descendants of the Austric-speaking Proto-Australoid race. Besides Bangladesh, the Santal tribe can also be observed in the neighboring West Bengal and Bihar States of India.
Santals are considered to be the original settlers of the area, where they cleared the then existing forests and built up their residences. Even as of this date, the Santals rely on hunting wild animals for their dietary meat to quite some extent. The Santals have their own traditional medicinal practitioners (TMPs), and being the original settlers of the land, their TMPs have through generations built up an extensive knowledge of the medicinal properties of plants found in the vicinity of their residences. \(^{1-5}\)

Considerable differences exist between the TMPs of Santals residing in various districts of Bangladesh, among the TMPs of various Santal clans, and Santal TMPs versus mainstream folk medicinal practitioners (Kavirajes) of the country. \(^{2-5}\) Bangladesh is a land of considerable diversity in traditional medicinal practices among which Ayurveda, Unani, folk medicine and tribal medicine has sometimes blended and sometimes stayed independent of each other. As a result, it is important to document the practices of virtually every traditional medicinal practitioner of Bangladesh, be it among tribes or among folk medicinal practitioners. This documentation is important for not only traditional medicinal practices are to some extent eroding as a result of influence of allopathic medicine and modernization, but also much valuable medicinal plant knowledge will be lost with the disappearance of traditional medicinal practices. Towards a thorough documentation of traditional medicinal practices, we had been conducting ethnomedicinal surveys among various tribal and folk medicinal practitioners of even individual villages or tribal residences for the last few years. \(^{6-16}\) The objective of the present study was to conduct an ethnomedicinal survey among the Santal population of Binnaipata village in Dinajpur district of Bangladesh.

**METHODS**

The survey was carried out among the Santal population residing in Binnaipata village, Dinajpur district, Bangladesh. The Santal as well as mainstream Bengali-speaking settlers were serviced by a Santal TMP, named Nedem Kaviraj, the last part of the name being a title demonstrating that he practiced traditional medicine. The TMP was aged 62 years. Prior Informed Consent was first obtained from the TMP. He was thoroughly apprised as to the nature of our visit and consent obtained to disseminate any information both nationally and internationally. Actual interviews were conducted in the Bengali language, which was spoken fluently by the TMP as well as the interviewers. The interviews were conducted with the help of a semi-structured questionnaire and the guided filed-walk method of Martin \(^{17}\) and Maundu. \(^{18}\) In this method the TMP took the interviewers on guided field-walks through
areas from where he collected his medicinal plants, pointed out the plants, and described their uses. All plant specimens were photographed and collected on the spot, pressed, dried and brought back to Bangladesh National Herbarium at Dhaka for identification. Voucher specimens were deposited with the Medicinal Plant Collection Wing of the University of Development Alternative. The survey took place in between May-July, 2014.

RESULTS
The Santal tribal healer was observed to use a total of 16 plants distributed into 14 families in his various formulations. The total number of formulations was fourteen. The plants were used for treatment of diabetes, cuts and wounds, fever, respiratory tract disorders, skin disorders, bone fracture, sprain, physical weakness, gastrointestinal disorders, leucorrhrea, spermatorrhea, and pain. Among the various afflictions, treatment of bone fracture or sprain, cuts and wounds, and pain were treated with more than one formulation. One formulation was used as an abortifacient. The results are shown in Table 1.

The various formulations differed in nature as to contain a single plant or multiple plants or plant parts. For instance, diabetes was treated with a combination of two plants, namely *Catharanthus roseus* and *Coccinia grandis*. A formulation for treatment of bone fracture and sprains contained both *Cissus quadrangularis* and *Stephania glabra*. Some plants were used for treatment of multiple diseases or symptoms. *Stephania japonica* was used for treatment of both mucus in children as well as dysentery and blood dysentery. Sometimes, different plant parts of the same plant were used to treat different diseases. The leaves of *Drynaria quercifolia* were used to stop bleeding from cuts and wounds, while roots were used to treat sprains and bone fractures. These observations suggest that the TMP not only possessed good knowledge on the medicinal properties of a given plant, but also recognized that different parts from the same plant can be used for treatment of diverse diseases.
Table 1. Medicinal plants of the Santal healer in Dinajpur district, Bangladesh

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Scientific Name</th>
<th>Family Name</th>
<th>Local Name</th>
<th>Parts used</th>
<th>Disease, Symptoms, Formulations, and Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Catharanthus roseus L.</td>
<td>Apocynaceae</td>
<td>Nayan tara</td>
<td>Flower</td>
<td>Diabetes (symptoms: frequent urination, constipation, frequent thirsts, non-healing of infections, loss of weight). Flower juice of <em>Catharanthus roseus</em> is mixed with leaf juice of <em>Coccinia grandis</em> and taken daily (half glass) in the morning orally.</td>
</tr>
<tr>
<td>2</td>
<td>Licuala peltata Roxb.</td>
<td>Arecaceae</td>
<td>Himshim dhukut</td>
<td>Leaf</td>
<td>To cause abortion. Half cup of leaf juice is orally taken once daily for several consecutive days.</td>
</tr>
<tr>
<td>3</td>
<td>Asparagus racemosus Willd.</td>
<td>Asparagaceae</td>
<td>Shotomul</td>
<td>Root</td>
<td>See <em>Lygodium flexuosum</em>.</td>
</tr>
<tr>
<td>4</td>
<td>Coccinia grandis (L.) Voigt</td>
<td>Cucurbitaceae</td>
<td>Tela kochu</td>
<td>Leaf</td>
<td>See <em>Catharanthus roseus</em>.</td>
</tr>
<tr>
<td>5</td>
<td>Euphorbia antiquorum L.</td>
<td>Euphorbiaceae</td>
<td>Vejdol</td>
<td>Whole plant</td>
<td>Cuts, wounds. Whole plant is cut and the sap that oozes out is applied to cuts and wounds. At the same time, crushed whole plant is taken orally. The sap is applied 2-3 times daily. One spoonful of the crushed whole plant is taken orally.</td>
</tr>
<tr>
<td>6</td>
<td>Erythrina variegata L.</td>
<td>Fabaceae</td>
<td>Manda gach</td>
<td>Leaf</td>
<td>Chronic mucus with respiratory difficulties. Paste of leaves is massaged on the chest 1-2 times daily.</td>
</tr>
<tr>
<td>7</td>
<td>Swertia chirayita (Roxb. ex Fleming.) H.Karst.</td>
<td>Gentianaceae</td>
<td>Chirata</td>
<td>Leaf</td>
<td>Helminthic infections (symptoms: stomach pain, indigestion, passing of helminthes with stool, weakness). Leaves are soaked in water overnight followed by drinking the water the next morning. This is done daily till cure. Whole body itches, chronic fever. Leaves are boiled in water to prepare decoction. The decoction (half cup) is taken orally with honey daily in the morning.</td>
</tr>
<tr>
<td>8</td>
<td>Litsea glutinosa</td>
<td>Lauraceae</td>
<td>Mali baula</td>
<td>Bark</td>
<td>Bone fracture, sprain. Bark is soaked in water</td>
</tr>
<tr>
<td>No.</td>
<td>Species</td>
<td>Family</td>
<td>Part Used</td>
<td>Condition</td>
<td></td>
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<tr>
<td>9</td>
<td>Lygodium flexuosum (L.) Sw.</td>
<td>Lygodiaceae</td>
<td>Root</td>
<td>whence a reddish gum oozes out. The gum is applied topically to fractured or sprained area 2-3 times daily.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Stephania glabra (Roxb.) Miers.</td>
<td>Menispermaceae</td>
<td>Stem</td>
<td>Physical weakness. Paste of roots of <em>Lygodium flexuosum</em> and <em>Asparagus racemosus</em> is prepared; one spoonful of paste is taken orally in the morning.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Stephania japonica (Thunb.) Miers.</td>
<td>Menispermaceae</td>
<td>Leaf</td>
<td>Bone fracture, sprain. Paste of stems of <em>Stephania glabra</em> and <em>Cissus quadrangularis</em> is applied topically to fracture or sprains 2-3 times daily for several days.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Cymbopogon citratus (DC.)</td>
<td>Poaceae</td>
<td>Leaf</td>
<td>Mucus in children. Leaf juice is massaged 1-2 times daily on the chest. Dysentery, blood dysentery. One spoonful of leaf juice is taken twice daily for several consecutive days.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Drynaria quercifolia (L.) J. Sm.</td>
<td>Polypodiaceae</td>
<td>Leaf, root</td>
<td>Infections or injuries of the skin. Leaves are fried in oil and the oil massaged on the infected area once or twice daily.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Abroma augusta L.</td>
<td>Sterculiaceae</td>
<td>Whole plant, root</td>
<td>To stop bleeding from cuts and wounds, fracture, sprain. Leaf juice is applied immediately to cuts and wounds to stop bleeding. Crushed roots are applied topically with oil to fractures and sprains.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Cissus quadrangularis L.</td>
<td>Vitaceae</td>
<td>Stem</td>
<td>Leucorrhoea. One spoon of juice obtained from crushed whole plant is orally taken daily in the morning. Spermatorrhea. Powdered root is taken orally every morning with banana and milk.</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Vitis latifolia Roxb.</td>
<td>Vitaceae</td>
<td>Leaf</td>
<td>Leucorrhoea, body pain. One spoonful of leaf juice is orally taken daily for several consecutive days.</td>
<td></td>
</tr>
</tbody>
</table>
DISCUSSION

Diabetes is a disease characterized by high levels of sugar in blood and/or urine. The disease cannot be cured with allopathic medicine. The Santal TMP used a combination of flowers of *Catharanthus roseus* and leaves of *Coccinia grandis* to treat this disease. Interestingly, aqueous flower extract of *Catharanthus roseus* led to significant reduction in blood sugar in alloxan diabetic rats following administration. [19] The blood sugar lowering effect of *Coccinia grandis* leaves has also been demonstrated in humans. [20] Thus the two plant parts can produce a synergistic effect in lowering blood sugar.

The TMP used *Vitis latifolia* for treatment of body pain. Fruit extract of the plant has been reported to show analgesic and anti-inflammatory effects. [21] *Swertia chirayita* was used by the Santal TMP to treat helminthiasis. Anthelmintic activity of the plant has been observed against gastrointestinal nematodes in sheep. [22] The plant was also used by the TMP for fever. It may be noted that the plant has wide-spread uses in traditional Indian medicines for treatment of fever. [23] In traditional Indian medicine, *Erythrina variegata* is used as an anti-asthmatic; [24] the plant was used by the TMP to treat respiratory difficulties.

Interestingly, *Litsea glutinosa*, which was used by the TMP to treat bone fractures and sprain is also used in Indian traditional medicine for treatment of bone fractures and sprains. [25] However, the use of *Stephania glabra* to treat bone fractures and sprain appears to be unique to this TMP and merits further scientific assessment for its validation. Notably, *Cissus quadrangularis* was used with *Stephania glabra* for bone fracture and sprain. The healing effect of *Cissus quadrangularis* on bone fracture is well established. [26] Bone fracture or sprain is always associated with pain. The analgesic activity of *Stephania glabra* has been reviewed. [27] So in this case, the TMP may have been using *Cissus quadrangularis* to heal bone fractures, and *Stephania glabra* was used to relieve pain associated with fractures. Overall, the use of the two plants reveal the extensive medicinal plant knowledge of the TMP, which is not surprising, considering that the Santals have lived in their present residences possibly for millennia and so had ample time to gather and generationally preserve this medicinal plant knowledge.

A comparison of the medicinal plants used by the Santal healer of Binnaipata village in Dinajpur district versus a Santal healer of Dabidubi village of the same district [4] reveals differences between the selection of medicinal plants and the disease(s) treated. For instance, the present healer used *Justicia gendarussa* to treat body pain and fever, while in the earlier
study the Santal healer used the plant to treat itches. *Asparagus racemosus* was used by the TMP in the present study along with *Lygodium flexuosum* to treat physical weakness. In the earlier survey, the Santal TMP used *Asparagus racemosus* to treat meho (diabetes). The previous Santal TMP used *Typhonium roxburghii* and *Stapelia gigantea* to treat bone fracture versus the use of *Cissus quadrangularis* along with *Stephania glabra* by the present Santal TMP. The present Santal TMP also used *Litsea glutinosa* to treat bone fractures. The findings underscore the importance of conducting as many surveys as possible among different healers to get a full understanding of the diversity of medicinal plant uses. It will also be worthwhile to investigate the causative factors behind the differences in treatment with medicinal plants even within the same district.

The discussion, while not extensive, clearly demonstrates two things. The first is that the Santal TMP possessed knowledge of the pharmacological properties of medicinal plants, some of which have been validated in the existing scientific literature. The second point is that a number of other plants, which are yet to be validated through appropriate pharmacological investigations merit attention from scientists to do so. Close observation of the traditional medicinal practices of the indigenous communities have led to the discovery of many modern drugs. \(^{[28]}\) The sandals and their medicinal knowledge should not be any exception to this rule.

**CONCLUSION**

The medicinal plants used by the Santal healer of Dinajpur district merit scientific attention for potential discovery of new drugs from these plants. Quite a number of the medicinal uses of plants were unique and if scientifically proven to be correct, can benefit both the tribal community as well as the rural people of Bangladesh who mostly lacks access to modern medicines.

**CONFLICTS OF INTEREST**

The author(s) declare that they have no competing interests.

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