ORIGINAL ARTICLE

Medicinal plants and formulations of the Goala tribe of Moulvibazar, Bangladesh

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ABSTRACT

Recent anthropological researches conducted in Bangladesh have largely refuted the notion that the country has only a dozen or more tribes. A number of small tribes, some on the verge of disappearance, have been found. As a result, recent estimates put the number of tribes in Bangladesh as possibly more than hundred. The Goala tribe is among one of these small tribes on the verge of disappearance and which has been located in one of the tea estates in Moulvibazar district of Sylhet Division in the country. Since practically nothing is known about the tribe including their traditional medicinal practices, an ethnomedicinal survey was conducted among the tribe. The total tribal population is about 220 with only one practicing tribal medicinal practitioner. It was observed that the practitioner treats various common ailments with medicinal plants. Altogether 25 plants were observed to be used by the practitioner. These plants were distributed into 16 families. The Euphorbiaceae family contributed 4 plants followed by the Apocynaceae and Combretaceae family with 3 plants each. The various ailments treated included heart disorders, tooth infections, swelling of gums, irregular menstruation, pain, low sperm density, gastrointestinal disorders, hair loss, whitening of hair, jaundice, eczema, snake bite, sexual problems and burning sensations during urination. To the best of our knowledge, this study is the first documentation of the traditional medicinal practices of the Goala tribe and so is of both anthropological and medicinal interest.

Key words: Medicinal plants, Goala tribe, Moulvibazar, Bangladesh.

Introduction

Bangladesh is a small country but has a history of people migrating into this area from ancient times. Earlier anthropological researches suggested that the country has a dozen to fifteen tribal groups still residing within the country. However, recent anthropological studies suggest existence of around 100 or more tribal groups residing in various pockets of the country. Most of these tribal groups are on the verge of disappearance, either through decrease in the size of the tribal population, or due to getting assimilated with the mainstream Bengali-speaking population of the country, who comprises almost 98% of the total population. Practically nothing is known about these small tribes. Not only documentation of these tribes is important from an anthropological view point but also from the ethnomedicinal perspective, since most indigenous communities have a good idea of the medicinal plants around their habitat, which plants they have used in their traditional medicinal practices for centuries for the treatment of various ailments. In fact modern medicine has sort of re-discovered many important drugs currently in use through close observations of medicinal practices of indigenous communities (Balick and Cox, 1996; Gilani and Rahman, 2005).

In most cases, members of a tribal community, in our experiences, keep to their own traditional or tribal medicinal practitioners (TMPs). This arises for a number of reasons like habitat in remote areas of the country where modern medical facilities and allopathic doctors are lacking, financial inability of tribal members to afford modern medicines, and last but not the least, a reluctance to visit and talk about personal sicknesses to any doctor who does not belong to the community. As such most tribes, even to this day, rely on their own TMPs to cater to their medicinal needs, at least for common ailments. Tribal medicinal practitioners exist in most indigenous communities of the world, and most such TMPs rely on medicinal plants as their main resource for disease treatment. This is because most tribes or indigenous communities still reside in remote areas, and from centuries-long contact with plants of the wild, and successive passage and enrichment of medicinal plant knowledge through generations, have acquired considerable knowledge on the medicinal plants and their

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The Goala tribe was located in a tea estate (tea garden) of Moulvibazar district in Sylhet Division of Bangladesh. A preliminary survey indicated that existing tribal members were only about 220. The tribe had one TMP, namely Lobin Goala, age around 65 years, and who mentioned that he had been practicing for the last 40 years. Informed consent was obtained from the practitioners and the tribal Headman to interview the practitioner and also to disseminate any information provided both nationally as well as internationally. Interviews were conducted in Bengali, the language of the mainstream population of Bangladesh, and which was spoken by both the tribal community as well as the interviewers. Actual interviews were conducted with the help of a semi-structured questionnaire and the guided field-walk method of Martin (1995) and Maundu (1995). In this method, the TMP took the interviewers on guided field-walks through areas from where he collected the medicinal plants, pointed out the plants and described their uses. Plant specimens were photographed, collected and dried and later brought back to Bangladesh National Herbarium for complete identification. Supplementary ethnomorphic information was collected from the tribal Headman, usually in evening sessions.

Results and Discussion

The tribal Headman mentioned that they have arrived at their present habitat from Assam in present day India. He estimated the total tribal population at about 220 persons and mentioned that practically all able-bodied women worked in the tea garden plucking tea leaves, and men were employed in the tea garden performing various jobs related to cultivation and maintenance of the tea plants and the whole estate. He further mentioned that their ancestors have arrived at this tea garden around 1921. The total number of families was 40. They have their own language known as ‘Bagani’, but for day to day work use the Bengali language to communicate with other workers in the tea garden. They practice the Hindu religion and worship deities like Kali, Laxmi and Durga. Their marriages are conducted as per the rules of Hindu religion; marriage only takes place among the tribal community members. Marriage dowry is not mandatory. Divorce is not allowed, and women do not re-marry if their husband dies. Of the 220 members, only three have some sort of education as to having completed their Secondary School Certificate Examination. Men usually wear a shirt and a ‘lungi’ (sarong-like), and women wear ‘sarees’. Their main occupation is to work in the tea garden, where they earn a minimum of Bangladeshi Taka 48 and a maximum of Bangladeshi Taka 70 per day (Bangladeshi Taka 82 = 1 US$). As such, all their incomes are below the poverty level income in Bangladesh, which is considered as income of US$ 1 per day. Their diet consists of rice, which is consumed with vegetables and/or meat of boars and male goats. For treatment of their diseases, they consult the only TMP present among them, though the younger generation is gradually leaning to allopathic doctors as provided for them by the tea estate owner.

It was observed that the Goala TMP used a total of 25 plants distributed into 16 families for treatment of what most can be considered as common ailments. Of the 16 families, the Euphorbiaceae family provided 4 plants, followed by the Apocynaceae and the Combretaceae family with 3 plants each. The results are shown in Table 1. Altogether, 17 formulations were mentioned to us by the TMP. With the exception of two formulations which involved mixture of several plant parts, the rest of the formulations were simple and basically comprised of treatment of a single ailment with a single plant part. For instance, low density of sperm was treated with oral administration of juice obtained from the leaves of *Crinum asiaticum* (Serial Number 4). Long-term constipation was treated with oral administration of roots of *Nerium indicum*; in fact, roots were advised to be taken directly by chewing (Serial Number 6). Swelling of gums was treated with simply brushing the gums with stems of either *Jatropha curcas* or *Jatropha gossypifolia* (Serial Numbers 13 and 14, respectively). Eczema was treated by simply massaging leaves of *Senna alata* on the affected area (Serial Number 18). In one formulation, waist
pain was treated by putting roots of *Amaranthus spinosus* in an amulet and then wearing the amulet around the body (Serial Number 3).

Table 2: Medicinal plants and formulations of the Goala TMP.

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Scientific Name</th>
<th>Family Name</th>
<th>Local Name</th>
<th>Utilized Part</th>
<th>Ailment(s) and formulation(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Andrographis paniculata</em> Burn.f.</td>
<td>Acanthaceae</td>
<td>Chirota</td>
<td>Stern</td>
<td>Stomach and heart disorders. 250g each of sliced stems of <em>Andrographis paniculata</em> are mixed with stems of <em>Azadirachta indica</em> A. Juss. (Meliaceae, local name: neem), bark of <em>Terminalia arjuna</em> (Roxb.) W. &amp; A. (Combretaceae, local name: arjun), bark of <em>Smilax ceylanica</em> L. (Smilacaceae, local name: jongli nagbeli) and root of <em>Ziziphus rugosa</em> Lam. (Rhamnaceae, local name: pithali), 50g of fruits of <em>Piper nigrum</em> L. (Piperaceae, local name: gol morich) and 250g talnishri [crystalline sugar obtained from sap of <em>Borassus flabellifer</em> L. (Arecaceae, local name: tal)] and soaked in 1.5 liter water for 12 hours. The mixture is then boiled till the volume has been reduced to 0.5 liter and then cooled and stored in a bottle. One spoonful of the decoction is taken thrice daily.</td>
</tr>
<tr>
<td>2</td>
<td><em>Achyrantes aspera</em> L.</td>
<td>Amaranthaceae</td>
<td>Upomargo</td>
<td>Root</td>
<td>Tooth infections; irregular menstruation. For tooth infections, roots are put inside the ear canal followed by sitting under the sun. For irregular menstruation, 1g of macerated root is taken orally for 7 days.</td>
</tr>
<tr>
<td>3</td>
<td><em>Amaranthus spinosus</em> L.</td>
<td>Amaranthaceae</td>
<td>Kata duga</td>
<td>Root</td>
<td>Waist pain. Roots are tied with a ribbon. Alternately, roots are put in an amulet and worn on the body.</td>
</tr>
<tr>
<td>4</td>
<td><em>Crinum asiaticum</em> L.</td>
<td>Amaryllidaceae</td>
<td>Bon peyaz</td>
<td>Leaf</td>
<td>Low density of sperm. Juice obtained from macerated leaves is taken with lentils for 1 month.</td>
</tr>
<tr>
<td>5</td>
<td><em>Spindias pinnata</em> (J.G. Konig ex L. f.) Kurz.</td>
<td>Anacardiaceae</td>
<td>Amra</td>
<td>Fruit</td>
<td>See Serial Number 16.</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> Mill.</td>
<td>Apocynaceae</td>
<td>Korobi, Kolka</td>
<td>Root</td>
<td>Long-term constipation. Roots are chewed.</td>
</tr>
<tr>
<td>7</td>
<td><em>Plumeria rubra</em> L.</td>
<td>Apocynaceae</td>
<td>Golonchi</td>
<td>Fruit</td>
<td>Hair loss in woman following childbirth. Crushed fruits are mixed with 2.5g fruits of <em>Piper nigrum</em> L. (Piperaceae, local name: gol morich) and 4g locally prepared wine. Two spoonfuls of the mixture is orally administered once daily for 3 days.</td>
</tr>
<tr>
<td>8</td>
<td><em>Tabernaemontana divaricata</em> R.Br.</td>
<td>Apocynaceae</td>
<td>Chokro goda phool</td>
<td>Bark</td>
<td>Cough in children. Juice obtained from macerated bark is warmed with 2-5 fruits of <em>Piper nigrum</em> L. (Piperaceae, local name: gol morich) and 1 spoonful of honey and taken once during the night by sucking.</td>
</tr>
<tr>
<td>9</td>
<td><em>Borassus flabellifer</em> L.</td>
<td>Arecaceae</td>
<td>Tal</td>
<td>Sap</td>
<td>See Serial Number 1.</td>
</tr>
<tr>
<td>10</td>
<td><em>Terminalia arjuna</em> (Roxb.) W. &amp; A.</td>
<td>Combretaceae</td>
<td>Arjun</td>
<td>Bark</td>
<td>See Serial Numbers 1 and 16.</td>
</tr>
<tr>
<td>11</td>
<td><em>Terminalia bellirica</em> (Gaertn.) Roxb.</td>
<td>Combretaceae</td>
<td>Bohera</td>
<td>Fruit</td>
<td>Constipation. Fruits are soaked in water for 3-4 hours followed by straining the water and drinking it.</td>
</tr>
<tr>
<td>12</td>
<td><em>Terminalia citrina</em> (Gaertn.) Roxb. ex Fleming</td>
<td>Combretaceae</td>
<td>Hortoki</td>
<td>Fruit</td>
<td>See Serial Number 16.</td>
</tr>
<tr>
<td>13</td>
<td><em>Jatropha curcas</em> L.</td>
<td>Euphorbiaceae</td>
<td>Varendi</td>
<td>Stem</td>
<td>Swelling of gums. Stems are used to brush gums.</td>
</tr>
<tr>
<td>14</td>
<td><em>Jatropha gossypifolia</em> L.</td>
<td>Euphorbiaceae</td>
<td>Arendi</td>
<td>Stem</td>
<td>Swelling of gums. Stems are used to brush gums.</td>
</tr>
<tr>
<td>15</td>
<td><em>Pedilanthus tithymaloides</em> L.</td>
<td>Euphorbiaceae</td>
<td>Goabi gach</td>
<td>Leaf</td>
<td>Sudden pain in any part of the body. Macerated leaves are applied to painful areas.</td>
</tr>
<tr>
<td>16</td>
<td><em>Phyllanthus emblica</em> L.</td>
<td>Euphorbiaceae</td>
<td>Awla</td>
<td>Fruit</td>
<td>Whitening of hair. Fruits of <em>Phyllanthus emblica</em> are mixed with bark of <em>Terminalia arjuna</em> (Roxb.) W. &amp; A. (Combretaceae, local name: arjun), fruits</td>
</tr>
</tbody>
</table>
Several plants, namely *Andrographis paniculata*, *Azadirachta indica*, *Terminalia arjuna*, *Smilax zeylanica*, *Ziziphus rugosa*, *Piper nigrum*, and *Borassus flabellifer* (Serial Number 1). *Terminalia arjuna* is widely used in Indian Ayurveda system of medicine for treatment of cardiovascular disorders (Khare, 2007) and this particular use of bark of the plant has been scientifically validated in a number of reports. These reports include protective effects of plant bark against Doxorubicin-induced cardiotoxicity (Singh et al., 2008); significant inotropic and hypotensive effect of bark, also increased coronary artery flow and protection of myocardium against ischemic-reperfusion injury (Gauthaman et al., 2005); cardioprotective effect of alcoholic extract of bark in an in vivo model of myocardial ischemic-reperfusion injury (Karthikeyan et al., 2003); efficacy of the plant in chronic stable angina (Dwivedi and Gupta, 2002; Bharani et al., 2002); beneficial effects of bark of the plant in isolated ischemic-reperfused rat heart (Gauthaman et al., 2001); beneficial effects in coronary artery disease (significant reductions in anginal frequency) (Dwivedi and Jauhari, 1997). The fruits of *Piper nigrum* are considered as carminative in Ayurveda, and may prove useful in stomach disorders like flatulence (Bloating), which in addition to being generally uncomfortable can also put pressure on the heart and lead to chest pain. *Andrographis paniculata* is also used in Ayurveda for treatment of flatulence and diarrhea in children, as well as colic and strangulation of intestines. The aqueous extract of leaves of *Azadirachta indica* is considered to have anti-ulcer properties (Khare, 2007). *Smilax zeylanica* is used in Ayurveda for treatment of dysentery. The bark of *Ziziphus rugosa* is also considered anti-diarrheal in Ayurveda. As such, this formulation of the Goala TMP suggests strong Ayurvedic influences, which is not unnatural considering that the Goalas claim to have originally come to their present habitat from Assam in India, and the origin of Ayurveda has been in India somewhat around 3,500 years ago.

The second complex formulation (Serial Number 16) for treatment of premature whitening of hair involved a mixture of fruits of *Phyllanthus emblica*, *Spondias pinnata* and *Terminalia citrina* along with barks of *Terminalia arjuna*. In Ayurveda, fruits of *Phyllanthus emblica* are considered to promote hair growth. The scientific rationality of the other plant parts used in this formulation remains to be elucidated.

Roots of *Achyranthes aspera* have been reported to be used as a toothbrush for getting rid of tooth infections (Srivastav et al., 2011). However, for treatment of tooth infections, the Goala TMP used the roots of this plant in a very unusual manner. He advised the patients to put the roots in the ear canal and sit in the sun (Serial Number 2). The fruits of *Terminalia bellirica*, used by the TMP for treatment of constipation (Serial Number 11) are also considered purgative when half ripe in Ayurveda (Khare, 2007). Root bark of *Jatropha curcas* is applied to sores in Ayurveda, the Goala TMP used it for treatment of swelling of gums (Serial Number 13), which can be due to gum sores.

Overall, it can be said, that the Goala TMP did not treat a large number of ailments and his formulations have a close similarity to the Ayurvedic use of medicinal plants. The comparatively low number of formulations suggests that possibly the major part of the Goala traditional medicinal practice may have been lost or forgotten.
which is not surprising considering that the Goala population has come down to less than 250 and then with only one aged tribal medicinal practitioner. Possibly this TMP is the last of his kind for we did not observe any young TMPs or any apprentices or trainees with the aged TMP. Nevertheless, the medicinal plants of the Goala TMP merit potential for further scientific studies, for even though the knowledge base is not broad, yet this small base can prove to be suitable enough for the discovery of novel, affordable and efficacious drugs.

References


