Phytomedicines of traditional health-care professionals in the vicinity of Lawachara Forest Reserve, Moulvibazar district, Bangladesh

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ABSTRACT

An ethnomedicinal survey was carried out among traditional health-care professionals practicing in the vicinity of Lawachara Forest Reserve in Sreemangal sub-district of Moulvibazar district, Bangladesh. Interviews were carried out with two practitioners who dispensed various medicinal plants to various tribal group and mainstream community members residing in the area. The two practitioners were observed to use a total of 43 plants distributed into 32 families for treatment of various diseases. The diseases treated included respiratory tract disorders, pain, gastrointestinal disorders, skin diseases, hair loss, hypertension, diabetes, rheumatic fever, dengue fever, jaundice, cuts and wounds, heart disorders, anemia, sexual disorders, and liver disorders. The formulations used were simple; plants or plant parts were orally taken or topically applied in the form of juice, direct chewing, and cooking followed by oral partaking of the cooked plants. The plants used for treatment of diabetes, rheumatic fever, dengue fever, heart and liver disorders merit special attention from scientists for they can form the basis of new drugs towards treatment of these diseases. Since gastrointestinal disorders and various types of pain are common disorders, scientific validation of plants used to treat these diseases can prove to be beneficial to the rural folks who lack access or cannot afford allopathic medicines.

Key words: Phytomedicine, Moulvibazar, Lawachara, medicinal plants, Bangladesh

INTRODUCTION

Plants have always formed the basis of medicines since prehistoric times. Since their advent, human beings have possibly through trial and errors discovered the medicinal values of plants. Prior to the introduction of allopathic medicine, and even since its introduction and use, indigenous societies continue to use medicinal plants for treatment. In Bangladesh, traditional medicinal practices exist in the form of Ayurveda, Unani, and folk medicinal practices.

The use of plants for treatment by indigenous societies and traditional health-care professionals is fairly common throughout the world, as evidenced by the number of ethnomedicinal reports published every year. Thousands of reports have been published detailing use of medicinal plants in virtually every continent of the world. Since a full list is beyond the scope of the present manuscript, only a few reports will be cited here. The Vaidyas (traditional medicinal practitioners) of Uttaranchal, India use 135 plants for treatment of various diseases [33]. The aborigines of southeastern Australia are known to use medicinal plants [23]. Use of medicinal plants by indigenous communities in Brazil has been reported [12]. Approximately 80% of the population of Ethiopia, Africa relies on herbal medicines for treatment [89]. Traditional use of medicinal plants has been reported among the aboriginal people inhabiting the boreal forests of Canada [87]. The indigenous people of Manokwari, West Papua use wild plants as traditional medicines [39]. In fact, many modern allopathic drugs have resulted from
medicinal plants through close observations of indigenous society practices [5,11,22].

Considering the importance of documenting traditional medicinal practices, we had been conducting ethnomedicinal surveys among folk and tribal medicinal practitioners for several years [51,55-57,10,26,28,45,46,59-67,1-7,9,25,30,31,68,69,78,80,13,27,28,36,70-73,79,4,49]. Bangladesh reportedly has at least 5,000 floral species and about a fifth of these floral species are believed to have ethnomedicinal uses. It is important to document these uses before they are lost. The objective of the present study was to conduct an ethnomedicinal survey among the traditional health-care professionals in the vicinity of Lawachara Forest Reserve in Sreemangal Upazila of Moulvibazar district, Bangladesh, which is regarded as a ‘hot-spot’ regarding floral species.

Materials and Methods

The area surveyed had three traditional health-care professionals. One of them was Bengali-speaking and belonged to the mainstream Bengali-speaking population and practiced among both mainstream as well as tribal residents of the area. The other was a tribal healer, who also practiced among both mainstream population and tribal residents. Prior Informed Consent was first obtained from the healers. The healers were explained the full scope of our visit and consent obtained to disseminate any information provided in both national and international venues. Actual interviews were conducted with the help of a semi-structured questionnaire and the guided field-walk method of conducting ethnomedicinal surveys among folk and tribal residents of the area.

The two practitioners were observed to use a total of 43 plants distributed into 32 families for treatment of various diseases. The diseases treated included respiratory tract disorders, pain, gastrointestinal disorders, skin diseases, hair loss, hypertension, diabetes, rheumatic fever, dengue fever, jaundice, cuts and wounds, snake bite, urinary troubles, heart disorders, anemia, sexual disorders, and liver disorders. The formulations used were simple; plants or plant parts were orally taken or topically applied in the form of juice, direct chewing, and cooking followed by oral partaking of the cooked plants. The results are shown in Table 1, and some comparative ethnomedicinal uses of the plants are discussed (below). It appears that the plants used by the healers have ethnomedicinal importance, and ethnomedicinal consensus or a large number of reports on a given plant indicate that the plant may be suitable for future drug discovery. Since a comparative ethnomedicinal discussion will be beyond the scope of the present paper, only selected species will be analyzed as to their diversity or consensus of ethnomedicinal uses.

<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>Andrographis paniculata (Burm.f.)</td>
<td>Acanthaceae</td>
<td>Kalomegh</td>
<td>Leaf</td>
<td>Coughs, cold. Leaf juice is orally taken.</td>
</tr>
<tr>
<td>2</td>
<td>Phlogacanthus thyrsiflorus Nees.</td>
<td>Acanthaceae</td>
<td>Kala bashok</td>
<td>Leaf</td>
<td>Coughs. Leaf juice is orally taken.</td>
</tr>
<tr>
<td>3</td>
<td>Aloe vera (L.)</td>
<td>Aloeaceae</td>
<td>Ghritokumar</td>
<td>Root</td>
<td>Tendon pain. Root paste is topically applied.</td>
</tr>
<tr>
<td>4</td>
<td>Aerva sanguinolenta (L.) Juss. ex. Schult</td>
<td>Amaranthaceae</td>
<td>Eden pata</td>
<td>Leaf</td>
<td>Dysentery. Leaf juice is orally taken.</td>
</tr>
<tr>
<td>5</td>
<td>Amaranthus spinosus L.</td>
<td>Amaranthaceae</td>
<td>Kata dugi</td>
<td>Stem</td>
<td>Flatulence, dysentery. Stem juice is orally taken by sucking.</td>
</tr>
<tr>
<td>6</td>
<td>Annona muricata L.</td>
<td>Annonaceae</td>
<td>Ata</td>
<td>Leaf</td>
<td>Hair loss. Equal amount of crushed leaf and coconut oil is applied to the hair for ¼ hour.</td>
</tr>
<tr>
<td>7</td>
<td>Centella asiatica (L.) Urb.</td>
<td>Apiales</td>
<td>Thankuni, Chatmi, Khudra manki</td>
<td>Leaf, bark</td>
<td>Diarrhea, dysentery. Leaf juice is orally taken for 3 days. Stomach pain. Bark is orally taken.</td>
</tr>
<tr>
<td>8</td>
<td>Alstonia scholaris (L.) R.Br.</td>
<td>Apocynaceae</td>
<td>Chatim</td>
<td>Bark</td>
<td>Skin diseases. Bark paste is topically applied.</td>
</tr>
<tr>
<td>9</td>
<td>Rauvolfia serpentina (L.)</td>
<td>Apocynaceae</td>
<td>Shorpgondha</td>
<td>Root</td>
<td>Hypertension. Roots are taken orally.</td>
</tr>
<tr>
<td>No.</td>
<td>Scientific Name</td>
<td>Family</td>
<td>Part Used</td>
<td>Uses</td>
<td></td>
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</tr>
<tr>
<td>10</td>
<td>Allocaisia macrocarpa (L.) G. Don.</td>
<td>Araceae</td>
<td>Leaf</td>
<td>Diabetes. Leaves are fried with onion and garlic and orally taken.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Colocasia esculenta (L.) Schott</td>
<td>Araceae</td>
<td>Stem</td>
<td>Severe headache. Stems are sliced into small pieces, warmed and taken orally.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Calotropis gigantea R.Br.</td>
<td>Asclepiadaceae</td>
<td>Leaf</td>
<td>Chest pain. Sap of leaf is mixed with mustard, warmed and applied to chest.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Asparagus racemosus (Wild.)</td>
<td>Asparagaceae</td>
<td>Leaf, flower</td>
<td>To increase lACTation. Leaf and flower juice is orally taken.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Wedelia chinensis (Osbeck) Merrill</td>
<td>Asteraceae</td>
<td>Stem</td>
<td>Toothache. Leaves are chewed and orally taken or chewed and spitted out.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Gaura pendant Roxb.</td>
<td>Burseraceae</td>
<td>Leaf</td>
<td>Rheumatic fever. Leaf juice is orally taken.</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Crataeva magna (Lour.) DC.</td>
<td>Capparidaceae</td>
<td>Leaf, bark</td>
<td>Pain. Leaf or bark paste is topically applied.</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Carica papaya L.</td>
<td>Caricaceae</td>
<td>Fruit</td>
<td>Dengue fever. Unripe fruits are cooked and taken orally or ripe fruits are taken orally.</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Terminalia arjuna (Roxb.) Wight &amp; Am.</td>
<td>Combretaceae</td>
<td>Bark</td>
<td>Heart disorders, low semen density. Powder prepared from roots is orally taken every night on an empty stomach.</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Kalanchee pinnata (Lam.) Pers.</td>
<td>Crassulaceae</td>
<td>Leaf</td>
<td>Heart disorders. Leaf juice is orally taken.</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Cucumis sativus L.</td>
<td>Cucurbitaceae</td>
<td>Leaf</td>
<td>Diabetes. Leaves are fried and taken orally.</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Cuscuta reflexa Roxb.</td>
<td>Cuscutaceae</td>
<td>Whole plant</td>
<td>Jaundice. Whole plant juice is orally taken.</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Manihot esculenta Crantz</td>
<td>Euphorbiaceae</td>
<td>Tuber</td>
<td>Cuts and wounds, hunger. Tuber paste is topically applied to cuts and wounds. Tubers are cooked and eaten to mitigate hunger.</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Phyllanthus emblica L.</td>
<td>Euphorbiaceae</td>
<td>Fruit</td>
<td>Hair loss, blood purifier. Fruits are orally taken.</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Ricinus communis L.</td>
<td>Euphorbiaceae</td>
<td>Leaf</td>
<td>Rheumatic fever. Leaf juice is orally taken.</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Cassia alata L.</td>
<td>Fabaceae</td>
<td>Leaf</td>
<td>Skin diseases. Leaf paste is applied topically with a little table salt.</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Mucuna prurient L.</td>
<td>Fabaceae</td>
<td>Seed</td>
<td>Snake bite. Seed paste is topically applied around the bitten area.</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Saraca asoca (Roxb.) Wilde</td>
<td>Fabaceae</td>
<td>Bark</td>
<td>Urinary troubles, indigestion, dysentery. Bark powder is orally taken.</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Hyptis suaveolens Poit</td>
<td>Lamiaceae</td>
<td>Fruit</td>
<td>Weakness. Fruits are orally taken.</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Leucas aspera (Wild.) L.</td>
<td>Lamiaceae</td>
<td>Flower leaf</td>
<td>Coughs in children and adults. Flowers are administered to children with mother’s milk. Leaves are cooked and orally taken by adults.</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Ocimum tenuiflorum L.</td>
<td>Lamiaceae</td>
<td>Leaf</td>
<td>Coughs. One leaf is orally administered with mother’s milk for coughs in children. Leaf juice is orally taken with honey for coughs in adults.</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Allium sativum L.</td>
<td>Liliaceae</td>
<td>Clove</td>
<td>Fever, heart disorders. Cloves are cooked and taken orally.</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Lygodium flexuosum (L.) Sw.</td>
<td>Lygodiaceae</td>
<td>Leaf</td>
<td>Rheumatic fever, anemia. Leaves are cooked and orally taken.</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Lawsonia inermis L.</td>
<td>Lythraceae</td>
<td>Leaf</td>
<td>Skin infections. Leaf paste is topically applied.</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Hibiscus rosa sinensis L.</td>
<td>Malvaceae</td>
<td>Flower</td>
<td>Blood dysentery. Flowers are chewed with molasses and orally taken for a few weeks.</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Acmatostachis indica A. Juss.</td>
<td>Meliaceae</td>
<td>Leaf</td>
<td>Skin infections. Leaf paste is topically applied.</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Strebla asper Lour.</td>
<td>Moraceae</td>
<td>Leaf, bark</td>
<td>Toothpaste. Crushed leaves and bark is used to brush teeth.</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Cynodon dactylon (L.) Pers.</td>
<td>Poaceae</td>
<td>Whole plant</td>
<td>To stop bleeding from cuts and wounds. Crushed whole plant is topically applied.</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Aegle marmelos (L.)</td>
<td>Rutaceae</td>
<td>Fruit</td>
<td>Indigestion, loss of appetite. Fruit juice is taken for 2-3 days.</td>
<td></td>
</tr>
</tbody>
</table>
Andrographis paniculata was used by the healers to treat coughs and colds. The plant is reportedly used by the Deb barma clan of the Tripura tribe of Moulibazar district, Bangladesh to treat malaria [32]. Traditional healers of Kancheepuram district of Tamil Nadu, India use the plant to treat snake bite and diabetes [48]. The rural people of Mayurbhanj district, Orissa, India use the plant to treat skin diseases, malaria, stomach pain, and dysentery [77]. The plant is used to treat indigestion by folk medicinal practitioners of Bagerhat district, Bangladesh [59]. The tribal and local inhabitants of Rajouri-Poonch districts of Jammu and Kashmir, India use the plant for the treatment of kidney disorders [3]. The Baiga tribals in Amarkantak Meikal Forest of Madhya Pradesh, India use the plant against malaria [34]. The Tripuri tribe of Tripura State, India uses the plant as a hepatoprotective agent [13]. The Santal, Saunti, Lodha and Bathudi tribes of Kaptipada Forest Range, Orissa, India use the plant as a tonic and against fever [6]. The Malayali tribes of Yercaud Hills, Southern Eastern Ghats, Salem District, Tamil Nadu, India, use the plant against diabetes [75]. The tribals of Mayurbhanj district, Orissa, India, use the plant to treat warts [76]. The Tharu tribes of Dudhwa National Park, India, use the plant for fever and anorexia [37]. The Gond tribe of Adilabad district, Andhra Pradesh, India uses the plant against all sorts of fever including malarial, typhoid, and viral fevers [47]. The Bauri tribal community of Moulibazar district, Bangladesh uses the plant against fever including malarial fever [15]. The villagers in Kumargarhi Hills of Salem district, Tamil Nadu, India use leaves to treat dyspepsia, helminthiasis, and stomach ache, and roots to treat fever and as a tonic [2]. The plant is used to treat sexual disorders in Kamrup district, Assam, India [17]. The tribals of Sheopur district, Madhya Pradesh, India use the plant against stomach diseases and cholera (Pathak and Mishra, 2011). The Garo tribe inhabiting the Madhupur forest region of Bangladesh uses the plant to treat fever, headache, and vertigo [44]. The plant has been scientifically proven to be effective against common cold [18].

Centella asiatica was used by the healers to treat diarrhea and dysentery. The tribal communities (Kol, Gond, Mawasi) of Chitrakoot, Madhya Pradesh, India use the plant against rickets in children [81].

The Baiga tribals of Madhya Pradesh, India use the plant against syphilis, mental disorders, and skin disease [34]. The Kani tribals of Pechhiparai Hills of Southern Western Ghats of Tamil Nadu, India use the plant against stomach upset or indigestion [88]. The Marakh sect of the Garo tribe inhabiting Mymensingh district in Bangladesh uses the plant against excessive bleeding menstruation [74]. The Bauri tribal community of Moulibazar district, Bangladesh uses the plant against dysentery [13].

The Deb barma clan of the Tripura tribe of Moulibazar district, Bangladesh uses the plant against stomach disorders [32]. The tribals of Meghalaya, Northeast India use the plant against diarrhea and dysentery [38]. The tribes of Rajasthan, India apply the plant to painful rheumatic joints [35]. The Tai-Khamyang tribe of Assam, India uses the plant against carbuncle and piles [83]. The tribes of Pratapgarh, Rajasthan, India use the plant as a diuretic and against leprosy and in improving memory [43]. The plant is used against anxiety neurosis, colitis, cough, and bronchial asthma by the local traditional practitioners in Mount Abu, Rajasthan, India [21]. The plant is used for loss of appetite and diarrhea by the Nag clan of the Rai Ghatual tribe in Moulibazar district, Bangladesh [14]. The plant has been shown in scientific studies to be active against enteric pathogens [40], and so can prove useful in diarrhea and dysentery.

Alocasia macrorrhizos was used by the healers against diabetes. Leaves of the plant were fried with onion and garlic and advised to be consumed by diabetic patients. The plant is used for treatment of pus in ears and decreased eyesight by folk medicinal practitioners of Dhamrai in Dhaka district, Bangladesh [56]. The Gor tribe of Sylhet district, Bangladesh uses the plant to treat erectile dysfunction [3]. Folk medicinal practitioners of Sylhet Division, Bangladesh use it against edema, pain, and cuts and wounds [62]. Folk medicinal practitioners of Ishwardi Upazila in Pabna district, Bangladesh use the plant against joint pain and swelling of legs and hands [26]. Kavirajes of Chañia area, Bangladesh use the plant against tiger bite, rheumatoid arthritis, and itches [61]. Traditional medicinal practitioners of Buxar district in Bihar, India use the plant on abscesses to expel pus [82]. Notably, antihyperglycemic activity has been...
observed with rhizomes of the plant [54]. Equally notably, the plant was advised to be taken with onion and garlic. Hypoglycemic effects of onion (Allium cepa) have been seen in Type I and II diabetic patients [20]. The antidiabetic properties of garlic (Allium sativum) have also been reported [84]. Thus the three plants together can produce a synergistic effect in controlling blood glucose levels in diabetic patients with the provision that the antihyperglycemic properties of the plants are not destroyed by frying.

Terminalia arjuna was used by the healers against heart disorders and low semen density. Tribal communities of Chitrakoot, Madhya Pradesh, India use the plant against headache and spermatorrhea [81]. Folk medicinal practitioners in several villages in Kurigram district, Bangladesh use the plant against heart disease, pain in heart, and blood coming from mouth [13]. The tribals of Hoshangabad, Madhya Pradesh, India use the plant against abdominal pain, diarrhea, and vomiting [86]. The Khasia tribe of Sylhet, Bangladesh uses the plant against heart diseases, fever, and ear ache [85]. The traditional practitioners of Mount Abu, Rajasthan, India use the plant against cardiac debility, diabetes, diarrhea, dysentery, and menstrual disorders [21]. The Garo tribal community living in Netrakona district, Bangladesh uses the plant against heart disease, dysentery, diarrhea, and jaundice [62]. The Bauri tribal community of Moulivibazar district, Bangladesh uses the plant against cardiovascular disorders, whitish discharge during urination, burning sensations during urination, and puerperal fever [13]. The Malayali tribe of Yercaud Hills, Southern Eastern Ghats, Salem district, Tamil Nadu, India uses the plant against diabetes [75]. The beneficial effects of the plant in coronary artery disease have been shown [19].

Ethnomedicinal comparisons of several randomly chosen plants obtained in the present survey suggest that the plants have similar ethnomedicinal uses elsewhere. Scientific reports also suggest that the uses of the plants by the healers are scientifically validated on the basis of the available bioactivity studies with the plants. The plants used by the healers therefore merit attention from scientists and further scientific research can lead to discovery of novel drugs from the plants. Such research is important for diseases like diabetes have no total cure in allopathic medicine. Diabetes can lead to other complications and is fast becoming endemic throughout the world. The healers used three different plants (Alocasia macrorrhizos, Cucumis sativus, Abroma augusta) for treatment of diabetes. Any one of these plants can become the basis of discovery of a new generation of antidiabetic drugs. It is noteworthy that antihyperglycemic activity of Cucumis sativus has been reported [52]. The hypoglycemic effect of Abroma augusta has also been shown in alloxan diabetic rats [24].

References


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