UNCOMMON MEDICINAL PLANT FORMULATIONS USED BY A FOLK MEDICINAL PRACTITIONER IN NAOGAON DISTRICT, BANGLADESH

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ABSTRACT

Background: Folk medicine is the most common form of various traditional medicinal systems in Bangladesh. The objective of this study was to document some uncommon uses of medicinal plants by a folk medicinal practitioner (Kaviraj) of Pabna district, Bangladesh.

Methods: Interviews of the Kaviraj were carried out with the help of a semi-structured questionnaire and the guided field-walk method.

Results: The Kaviraj used 23 plants distributed into 18 families in his formulations. The formulations were used to treat asthma, coughs, gastrointestinal disorders, hemorrhoids, urinary problems, tuberculosis, vomiting, abscess, chicken pox, miscarriage, rheumatism, malnutrition, fatigue, and as sex stimulant. Conclusion: The study suggests that the Kavirajes of Bangladesh differ considerably in their use of medicinal plants, which merits scientific attention to the plants towards discovery of new drugs.

KEYWORDS: Folk medicine, Kaviraj, Naogaon, Bangladesh.

INTRODUCTION

Bangladesh is a country of a number of traditional medicinal systems along with blending of all these systems in such a manner such that the practices of any particular traditional medicinal practitioner are quite unique. Firmly established traditional medicinal systems with their own formularies and even medical schools exist for Ayurveda, Unani and homeopathy.
But apart from these three systems, there are the folk medicinal practitioners (Kavirajes), who do not have any formal medical education and who may be influenced to some extent by these systems, or may be quite unique in his or her choice of formulations to treat various diseases. A Kaviraj usually uses medicinal plants as the major ingredient and more often the only ingredient in his or her formulations. The medicinal plant knowledge of a Kaviraj may be acquired through trial and errors or may be passed from generation to generation within the family. As such, every Kaviraj has his or her own unique formulations of medicinal plants, which in some cases may be similar to Kavirajes of other areas of the country while in other cases, may be completely different.

The importance of ethnomedicinal knowledge in the discovery of modern drugs is now accepted throughout the scientific community and even to some extent, the medical community. Modern or allopathic drugs have greatly improved a patient’s recovery rate from a number of diseases, but also suffer from problems like adverse effects, development of drug-resistant vectors, and for a number of diseases, simply the inability to cure. On the other hand, ethnomedicinal formulations have the distinction of being possibly used for centuries and so are more time-proven, though they may suffer from adequate scientific studies on the formulations. Nevertheless, it is true that adequate documentation and scientific studies on the ethnomedicinal practices of various indigenous communities have resulted in the discovery of numerous allopathic drugs, which have proven their value in treatment of previously incurable diseases.

Some recent drugs from medicinal plants which have proved their worth in treatment of difficult diseases include artemisinin (for treatment of malaria), nitisinone (for treatment of tyrosinaemia), tiotropium (for treatment of chronic obstructive pulmonary disease or COPD), and paclitaxel (for treatment of cancer).[^1] Plants in traditional medicinal systems have been described as one of the best routes for discovery of future drugs, which can prove beneficial in treatment of both old and merging diseases.[^2] It may be noted in this context, that although modern medicine does not have cure for diseases like diabetes, rheumatoid arthritis, and certain forms of cancer or cancer at a late stage (to name only a few), traditional medicinal systems claim to have cures for this diseases. In fact, more than at least 3,000 years ago, Ayurvedic treatises have described cancer as Granthi (minor neoplasm) or Arbuda (major neoplasm), and has prescribed remedies for them.[^3] As such, the aim of the modern...
researcher should be to approach the traditional medicinal systems with a new concept, which is to validate scientifically the treatment methods with the traditional medicinal formulations. Similar to the ‘barefoot’ doctors of China, Kavirajes can play a major role in the health-care system of Bangladesh, for practically every village in the country has one or more practicing Kavirajes. Moreover, the rural people of the country either lacks access to or cannot afford allopathic medicines. But since the practices of the Kavirajes are so varied, there needs to be adequate documentation and scientific validation of the Kavirajes’ practices. Towards that, we had been conducting ethnomedicinal surveys for the last few years.\textsuperscript{[4-32]} The objective of this survey was to document the medicinal plants and formulations of a Kaviraj (folk medicinal practitioner) in Naogaon district of Bangladesh, whose selection of medicinal plants we found to be somewhat unique and different from Kavirajes in our previous ethnomedicinal surveys. Moreover, there appeared to be Ayurvedic influences on the Kaviraj in his formulations.

METHODS

Prior Informed Consent was first obtained from the Kaviraj, Borrai Muddi, age 50 years, male, and practicing in Korai danga village in Naogaon district, Bangladesh. He claimed to have learnt his Kaviraj practices from his father. The Kaviraj was 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 Kaviraj as well as the interviewers. The interviews were conducted with the help of a semi-structured questionnaire and the guided field-walk method of Martin\textsuperscript{[33]} and Maundu.\textsuperscript{[34]} In this method the Kaviraj 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.

RESULTS

The Kaviraj used a total of 23 plants distributed into 18 families in his formulations. Altogether, his formulations numbered only nine because most of his formulations were polyherbal formulations i.e. contained a mixture of different plants or plant parts. In fact, the most simple of his formulation, which contained only one plant, was to use the roots of
Amaranthus dubius as sex stimulant. His various formulations were used to treat asthma, coughs, gastrointestinal disorders, hemorrhoids, urinary problems, tuberculosis, vomiting, abscess, chicken pox, miscarriage, rheumatism, malnutrition, fatigue, and as sex stimulant. The results are shown in Table 1.

From our earlier ethnomedicinal surveys, it appears that the only treatment which is in common between the present Kaviraj and other previously surveyed Kavirajes was the present Kavirajes’ use of Adhatoda vasica to treat coughs and asthma. But even then the present Kaviraj used roots of the plant, while other Kavirajes used leaves. [8, 35-36] And even more, the roots of the plant were used with fruits of Terminalia chebula, raisins, and honey or sugar. The rest of the formulations are not common with our previous ethnomedicinal observations within Bangladesh.

DISCUSSION

It is to be noted that fruits of Terminalia chebula are considered beneficial in Ayurveda for treatment of coughs and bronchial asthma and so is the plant, Adhatoda vasica. [37] Honey has been found beneficial in nocturnal coughs in a scientific study. [38] Honey is also considered useful in Ayurveda for treatment of bronchial asthma. [39] The anti-tussive effect of Adhatoda vasica has been reported in animal models of mechanical or chemical-induced coughs. [40] Thus the Kavirajes’ use of Adhatoda vasica, Terminalia chebula, and honey seems to be based on a good knowledge of the medicinal properties of these plants and honey, and which has not only been validated by scientific reports, but also suggests Ayurvedic influences.

The use of Bauhinia racemosa to treat stomach disorders by the Kaviraj also is supported by Ayurveda, where amongst other diseases, it is used for diarrhea. [37] In Ayurveda, Ipomoea mauritiana is used as a cholagogue, [37] which means it will increase bile flow to the intestines. The Kaviraj used the plant to increase appetite which can result from increased bile flow and consequent improved digestion. Fruits of Phyllanthus emblica and Elettaria cardamomum were also used by the Kaviraj along with Ipomoea mauritiana to increase appetite. In Ayurveda, the fruits of Phyllanthus emblica are considered as a gastrointestinal tonic and also used for treatment of dyspepsia. The fruits of Elettaria cardamomum are used in Ayurveda for loss of appetite. Thus the use of these plant parts in combination would produce a strong appetite-stimulating effect. The whole formulation shows Ayurvedic influences also in the sense that apart from Pterocarpus santalinus, the rest of the plants are considered Ayurvedic drug plants and improvement of appetite can result from partaking of
specific plant parts like fruits or tubers. The formulation merits scientific attention as to whether it can be scientifically validated as a gastrointestinal tonic. It is to be noted that the same formulation was used by the Kaviraj to treat tuberculosis. The scientific validation of this treatment needs to be determined.

The Ayurvedic Pharmacopoeia of India recommends *Tinospora cordifolia* for skin diseases; the Kaviraj used the plant against abscess and chicken pox. Notably, the plant was used along with *Azadirachta indica* and *Andrographis paniculata* for treatment of abscess and chicken pox by the Kaviraj. The former plant is recommended in Ayurveda for treatment of small pox as well as a blood purifier, while the latter plant is mentioned in Ayurveda as a blood purifier. Notably, abscess is known in Ayurveda as Vidhradhi and chicken pox as Laghu Masurika where skin and/or blood may be vitiated, that is spoiled or impaired. Hence, blood purification can help in both chicken pox and abscess. Furthermore, *Azadirachta indica* leaf extract has been shown to be inhibitory against skin pathogens \[41\], and so the presence of this plant part (although bark was used by the Kaviraj) may prove beneficial in skin disorders and in preventing further skin infections during chicken pox.

*Piper longum* has uses in Ayurveda as a digestive, appetizer and carminative. The Kaviraj used it against acidity and distaste in mouth, the latter signifying a loss of appetite or a distaste in food. It is interesting that the Kaviraj used fruits of *Piper longum* along with roots of *Plumbago zeylanica* and *Glycyrrhiza glabra*, and fruits of *Elettaria cardamomum*, and Triphala (equal amounts of dried and powdered fruits of *Terminalia bellirica*, *Terminalia chebula* and *Phyllanthus emblica*) along with sugar and milk as an appetizer and for miscarriages. Following miscarriage, the body would be weak. So the formulation is intended to increase appetite. The roots of *Glycyrrhiza glabra* (liquorice) are considered beneficial in Ayurveda against gastric ulcer. They have a slight sweet taste and occasionally given as cubes for sucking and to increase appetite. Triphala is considered a major Ayurvedic drug being used for a number of problems from early graying of hair to boosting up the immune system and increasing digestive capacity. \[42\] In fact, the use of Triphala is the strongest evidence that the Kaviraj was well aware of Ayurvedic medicines and Ayurvedic drug plants.
### Table 1: Medicinal plants and formulations of the Kaviraj from Naogaon district in 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><em>Adhatoda vasica</em> Nees.</td>
<td>Acanthaceae</td>
<td>Harbokso</td>
<td>Root</td>
<td>Asthma, coughs. Roots of <em>Adhatoda vasica</em> are mixed with fruits of <em>Terminalia chebula</em>, raisins, and honey or sugar and taken thrice daily orally.</td>
</tr>
<tr>
<td>2</td>
<td><em>Andrographis paniculata</em> Nees.</td>
<td>Acanthaceae</td>
<td>Kalomegh</td>
<td>Leaf</td>
<td>See <em>Tinospora cordifolia</em>.</td>
</tr>
<tr>
<td>3</td>
<td><em>Trianthema portulacastrum</em> L.</td>
<td>Aizoaceae</td>
<td>Punornoba</td>
<td>Whole plant</td>
<td>Stomach disorders, coughs, hemorrhoids. Decoction of whole plants of <em>Trianthema portulacastrum</em>, leaves of <em>Alocasia macrorrhizos</em>, and fruits of <em>Terminalia chebula</em> and <em>Trichosanthes dioica</em> is mixed with cow urine and taken orally twice daily.</td>
</tr>
<tr>
<td>4</td>
<td><em>Amaranthus dubius</em> Mart.</td>
<td>Amaranthaceae</td>
<td>Juankha</td>
<td>Root</td>
<td>Sex stimulant. Root juice is orally taken.</td>
</tr>
<tr>
<td>5</td>
<td><em>Alocasia macrorrhizos</em> (L.) G. Don.</td>
<td>Araceae</td>
<td>Kochu</td>
<td>Leaf</td>
<td>See <em>Trianthema portulacastrum</em>.</td>
</tr>
<tr>
<td>6</td>
<td><em>Bauhinia racemosa</em> Lam.</td>
<td>Caesalpiniaceae</td>
<td>Sheth Kanchon</td>
<td>Flower, bark</td>
<td>Stomach disorders, urinary problems. A combination of flower and bark juice is taken orally thrice daily.</td>
</tr>
<tr>
<td>7</td>
<td><em>Terminalia bellirica</em> (Gaertn.) Roxb.</td>
<td>Combretaceae</td>
<td>Bohera</td>
<td>Fruit</td>
<td>See <em>Plumbago zeylanica</em>.</td>
</tr>
</tbody>
</table>
| 8             | *Terminalia chebula* Retz         | Combretaceae    | Hortoki    | Fruit      | See *Adhatoda vasica*.  
 See *Trianthema portulacastrum*.  
 See *Plumbago zeylanica*.                                                                                              |
<p>| 9             | <em>Ipomoea mauritiana</em>             | Convolvulaceae  | Vui kumra  | Tuber      | Tuberculosis, to increase appetite. 3g powder of tubers of <em>Ipomoea mauritiana</em>, bark of <em>Pterocarpus</em>                  |</p>
<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Family</th>
<th>Part</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Trichosanthes dioica Roxb.</td>
<td>Cucurbitaceae</td>
<td>Fruit</td>
<td>Patal fruits are mixed with ghee (clarified butter) and honey and taken orally 3-4 times daily. See <em>Trianthema portulacastrum</em>.</td>
</tr>
<tr>
<td>11</td>
<td>Phyllanthus emblica L.</td>
<td>Euphorbiaceae</td>
<td>Fruit</td>
<td>Amloki fruits are mixed with ghee (clarified butter) and honey and taken orally 3-4 times daily. See <em>Ipomoea mauritiana</em>. See <em>Plumbago zeylanica</em>.</td>
</tr>
<tr>
<td>12</td>
<td>Glycyrrhiza glabra L.</td>
<td>Fabaceae</td>
<td>Root</td>
<td>Josthi modhu bark is mixed with ghee (clarified butter) and honey and taken orally 3-4 times daily. See <em>Plumbago zeylanica</em>.</td>
</tr>
<tr>
<td>13</td>
<td>Pterocarpus santalinus L.f.</td>
<td>Fabaceae</td>
<td>Root</td>
<td>Rokto chandan bark is mixed with ghee (clarified butter) and honey and taken orally 3-4 times daily. See <em>Ipomoea mauritiana</em>.</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Azadirachta indica A. Juss.</td>
<td>Meliaceae</td>
<td>Bark</td>
<td>Neem bark is mixed with ghee (clarified butter) and honey and taken orally 3-4 times daily. See <em>Tinospora cordifolia</em>.</td>
</tr>
<tr>
<td>16</td>
<td>Tinospora cordifolia (Willd.) Miers.</td>
<td>Menispermaceae</td>
<td>Leaf</td>
<td>Guloncho leaf is mixed with ghee (clarified butter) and honey and taken orally 3-4 times daily. Abscess, chicken pox. Leaves of <em>Tinospora cordifolia</em> and <em>Andrographis paniculata</em> and bark of <em>Azadirachta indica</em> are boiled in water and the extract taken orally on an empty stomach.</td>
</tr>
<tr>
<td>17</td>
<td>Piper longum L.</td>
<td>Piperaceae</td>
<td>Leaf, fruit, root</td>
<td>Pipulda leaves, fruits and dehusked seeds of <em>Hordeum vulgare</em> is taken orally once daily. Acidity, vomiting, distaste in mouth. Decoction of leaves, fruits and roots of <em>Piper longum</em>, and dehusked seeds of <em>Hordeum vulgare</em> is taken orally once daily. See <em>Plumbago zeylanica</em>.</td>
</tr>
<tr>
<td>18</td>
<td>Plumbago zeylanica L.</td>
<td>Plumbaginaceae</td>
<td>Root</td>
<td>Chita root is mixed with ghee (clarified butter) and honey and taken orally 3-4 times daily. Miscarriage, appetizer. Roots of <em>Plumbago zeylanica</em> and <em>Glycyrrhiza glabra</em>, fruits of <em>Piper longum</em> and <em>Elettaria cardamomum</em>, and <em>Triphala</em> (equal amounts of dried and powdered fruits of <em>Terminalia bellirica</em>, <em>Terminalia chebula</em> and <em>Phyllanthus emblica</em>) are mixed with sugar and taken orally with milk.</td>
</tr>
</tbody>
</table>
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**CONCLUSION**

Taken together, the formulations of this Kaviraj to some extent not only shows Ayurvedic influences, but also can be validated on the basis of scientific evidences. The uses of a number of uncommon plants by the Kaviraj suggest strongly that the plants should be further studied towards discovery of effective compounds against the diseases treated by the Kaviraj. Poly-herbal formulations, in general, have two advantages: that of producing synergistic effects by the various plants involved, and negating adverse effects of any particular plant within the formulation through a second or more plants. Thus the poly-herbal formulations of this Kaviraj merit further scientific attention.

**Conflicts of interest**

The authors declare that there are no conflicts of interest.
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