ORIGINAL ARTICLES

Medicinal plants used by the folk medicinal practitioners of Bangladesh: a randomized survey in a village of Narayanganj district


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ABSTRACT

Folk medicinal practitioners play an important role in the primary health-care system of Bangladesh. They are known as Kavirajes and practice in villages, towns and cities of the country. The mainstay of their formulation is medicinal plants, which is either administered orally or topically in the form of decoctions, pastes, pills, juice or direct administration of whole plant or plant parts. The objective of the present study was to conduct a survey in a randomly chosen village, which lies between the two urban areas of Dhaka and Narayanganj in Narayanganj district of Bangladesh. Kasipur, the village where the survey was carried out had one Kaviraj who administered to the population’s need in various diseases. It was observed that the Kaviraj used 64 medicinal plants in his formulations. The plants were distributed into 41 families. The Asteraceae family contributed to the highest number of plants (6) followed by the Fabaceae family with 5 plants. The Apocynaceae, Lamiaceae, Rutaceae, Solanaceae and Zingiberaceae families contributed 3 plants per family. Leaves constituted the major plant part used, forming 47.1% of total uses. Leaves were followed by roots at 16.3% and fruits at 13.5%. Gastrointestinal disorders and skin diseases were the main ailments treated. Other than diabetes, the Kaviraj did not treat any complicated diseases. This was probably because since the village surveyed was between two urban areas, the village population had quite easy access to allopathic doctors and modern clinics in the urban areas. Despite the easy access to modern doctors, the village people relied on the Kaviraj for treatment of common ailments, suggesting that folk medicinal practitioners can still play a considerable role in the day to day care of health and treatment of common diseases, thus saving a patient from incurring substantial costs related to modern allopathic doctors and clinics.

Key words: Medicinal plants, folk medicine, Narayanganj, Kaviraj, Bangladesh.

Introduction

Folk medicinal practitioners, otherwise known as Kavirajes, constitute a major role in providing primary health-care to the population of Bangladesh. In general, their patients come from the poor strata of the society; nevertheless, if a Kaviraj has enough experience and is noted for his or her treatment, the Kaviraj is also frequented by the more affluent sections of the people for treatment of various ailments. Enough anecdotal evidence suggests that folk medicine has helped cure many patients with diseases that cannot be cured with modern allopathic medicine. The practice of a Kaviraj is usually family-based and continued from generation to generation. Thus with successive generations, a Kaviraj can accumulate an extensive knowledge on the medicinal properties and uses of medicinal plants, which form the mainstay of their formulations.

Practically every village of the 86,000 villages of Bangladesh, as well as the towns and cities have one or more Kavirajes, which usually depends on the population size of the particular village, town or city. The formulations of the Kavirajes are very simple and usually consist of oral or topical administration of whole plant or plant parts, which may be administered in the form of decoctions, pastes, pills, juice or direct administration of the plant. Since such form of treatment is comparatively cheap, it can be afforded by all sections of the society. We had been conducting ethnomedicinal surveys among both the Kavirajes of the mainstream population as well as tribal medicinal practitioners for a number of years (Nawaz et al., 2009; Rahmatullah et al., 2009a-c; Hasan et al., 2010; Hossan et al., 2010; Mollik et al., 2010a,b; Rahmatullah et al., 2010a-g; Jahan et al., 2011). In our surveys, it has been noted that the medicinal plants used by any particular Kaviraj to treat a specific ailment can differ from another Kaviraj in the vicinity for treatment of the same ailment. Thus to gain a comprehensive knowledge of the medicinal plant usage in Bangladesh by the Kavirajes, it is imperative to...
survey as many localities as possible and gather information from the practicing Kaviraj at that locality. The objective of the present study was to conduct an ethnomedicinal survey among the practicing Kavirajes in a randomly chosen village of Kasipur, which lies between two urban centers, namely, Dhaka and Narayanganj.

Materials and Methods

The present survey was carried out at Kasipur village in Kasipur Union, which lies between two urban centers of Bangladesh, namely Dhaka and Narayanganj. The village itself falls in Narayanganj district and has a population of about 8,000. The village was chosen randomly; however, the major reason for choosing this village was to find out what sort of ailments were being taken by patients for treatment by folk medicinal practitioner(s) of the village, since the village population had access to modern allopathic doctors and hospitals at both Dhaka and Narayanganj. The village was found to have one practicing Kaviraj, namely, Mr. Md Ilias, aged 35 years.

Informed consent was initially obtained from the Kaviraj, who was told in details as to the nature of our visit. Consent was obtained that the information may be presented both nationally and internationally. 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 Kaviraj took the interviewers on guided field-walks through areas from where he collected medicinal plants, pointed out the plants and described their uses. Plant specimens were photographed and collected on the spot. Dried plant specimens were brought back to Dhaka for identification by Mr. Manjur-Ul-Kadir Mia, ex-Curator and Principal Scientific Officer of Bangladesh National Herbarium.

Results and Discussion

It was observed that the Kaviraj of Kasipur village used a total of 64 plants distributed into 41 families for treatment. The results are shown in Table 1. The Asteraceae family contributed 6 plants followed by the Fabaceae family with 5 plants. The Apocynaceae, Lamiaceae, Rutaceae, Solanaceae and Zingiberaceae families contributed 3 plants each. Leaves constituted the major plant part used, forming 47.1% of the total uses. Roots constituted 16.3% of total uses, while fruits constituted 13.5% of total uses. Other plant parts used were stems, barks, flowers, seeds, rhizomes, cloves. Whole plants formed only 1.9% of total uses.

The major ailments treated were gastrointestinal disorders and skin diseases. Gastrointestinal disorders are a common ailment in Bangladesh, especially among the village people because of lack of quality drinking water. Skin diseases also occur quite frequently because of the general unhygienic conditions of living, working in the fields, and the hot and humid climate. At Kasipur village, the problem of skin diseases was compounded by the fact that the village lied between two highly industrialized urban areas of Dhaka and Narayangang. As the factories lacked adequate effluent treatment plants, the nearby rivers and canals were highly polluted, contributing to the incidences of skin diseases. However, other diseases were also treated like respiratory difficulties, fever, coughs and colds, hair loss, anemia, tooth problems, pain, cuts and wounds, hemorrhoids, burns, jaundice, irregular menstruation and epilepsy. Diabetes was the only complicated disease treated by the Kaviraj for which modern allopathic medicine does not have a total cure.

The formulations of the Kaviraj were quite simple. For treatment of respiratory difficulties, merely boiled leaves or barks of Justicia adhatoda were orally administered. For toothache, teeth were advised to be brushed with young leaves of Mangifera indica. Occasionally, different plant parts from the same plant were used for treatment of different diseases. The leaves of Catharanthus roseus were orally administered for diabetes, while roots were topically applied for skin diseases and joint pain. The term skin diseases usually referred to diseases like scabies, eczema, fungal infections, sores, and boils. The same part of a plant could be used for treatment of multiple ailments. The leaves of Mangifera indica were used for treatment of toothache, tooth infections and dysentery. While for toothache and tooth infections, treatment consisted of brushing teeth with the leaves, for dysentery, young leaves were taken with a little honey. Honey and sugar were found to be combined with a number of formulations to make the formulation more palatable to the patient.

When the plant part was a fruit, several forms of administration were observed. Ripe fruits of Carissa carandas were advised to be directly taken as treatment for acidity. Fruits of Ananas comosus were also directly eaten in the raw as treatment for fever, colds and coughs. On the other hand, for treatment of constipation, loss of appetite, diarrhea and dysentery, ripe fruits of Tamarindus indica were soaked in water and the whole mixture taken in the form of a sherbert. Fruits of Ficus hispida were advised to be cooked and eaten for treatment of constipation and to aid digestion.

Topical applications consisted of plant part to which a little oil or ghee has been added. Ghee is boiled butter from which the liquid portion is taken out; as such, it can be referred to as clarified butter. The use of oil or ghee in topical applications showed a basic knowledge of topical treatment in the Kaviraj, even though the Kaviraj did not have any medical degrees but just obtained his knowledge from previous generations and current practice. Oil or ghee helps to spread the applied material more evenly on the skin, acts as an emollient, and
facilitates absorption of bio-active compounds through the skin. This facts alone suggest that folk medicinal treatment cannot be simply dismissed as quackery, as is done by allopathic doctors. Through accumulated knowledge over centuries, a Kaviraj can have a detailed knowledge of not only plants but the best way for administration of the plant for treatment of diseases.

Table 1: Medicinal plants used by the Kaviraj of Kasipur village of Narayanganj district, Bangladesh.

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Scientific Name</th>
<th>Family Name</th>
<th>Local Name</th>
<th>Utilized Part</th>
<th>Formulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Justicia adhatoda L.</td>
<td>Acanthaceae</td>
<td>Bashok</td>
<td>Leaf, bark</td>
<td>Respiratory difficulties, asthma. Boiled leaves or barks are orally administered.</td>
</tr>
<tr>
<td>2</td>
<td>Aloe vera (L.) Burm.f.</td>
<td>Aloaceae</td>
<td>Ghrito kumara</td>
<td>Leaf</td>
<td>Constipation, burns, skin disorders, diabetes. Sherbet prepared from soft pulp within the leaves is taken orally for constipation, skin diseases and diabetes. Macerated leaf pulp is topically applied to burns.</td>
</tr>
<tr>
<td>3</td>
<td>Mangifera indica L.</td>
<td>Anacardiaceae</td>
<td>Aam</td>
<td>Leaf</td>
<td>Toothache, tooth infections, dysentery. Teeth are brushed with young leaves as treatment for toothache and tooth infections. Crushed young leaves are taken with a little honey for dysentery.</td>
</tr>
<tr>
<td>4</td>
<td>Carissa carandas L.</td>
<td>Apocynaceae</td>
<td>Koromha</td>
<td>Fruit</td>
<td>Anemia, burning sensations in stomach (acidity). Sherbet prepared from macerated fruits is taken for anemia. Ripe fruits are taken for acidity.</td>
</tr>
<tr>
<td>5</td>
<td>Catharanthus roseus (L.) G. Don</td>
<td>Apocynaceae</td>
<td>Noyon tara</td>
<td>Leaf, root</td>
<td>Diabetes, skin diseases, joint pain. Leaves are chewed with a little honey for diabetes. Alternately, leaves are squeezed in water and the water taken for diabetes. Macerated roots are topically applied for skin diseases and joint pain.</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum Mill.</td>
<td>Apocynaceae</td>
<td>Rokto korobi</td>
<td>Leaf, root</td>
<td>Hair loss, skin diseases. Macerated leaves are applied to scalp to prevent hair loss. A combination of boiled leaves and roots are applied to affected areas for skin diseases.</td>
</tr>
<tr>
<td>7</td>
<td>Typhonium trilobatum (L.) Schott</td>
<td>Araceae</td>
<td>Kharkan, Chamkas</td>
<td>Leaf, root</td>
<td>Helminthiasis, burning sensations in the stomach. Boiled leaves are cooked and eaten as vegetable. Macerated roots are orally administered for helminthiasis and burning sensations in the stomach.</td>
</tr>
<tr>
<td>8</td>
<td>Calotropis procera (Ait.) Ait.f.</td>
<td>Asclepiadaceae</td>
<td>Akondo</td>
<td>Leaf</td>
<td>Joint pain, pneumonia. Macerated leaves of Justicia adhatoda and some cloves of Allium sativum are mixed with oil and applied to painful areas of joints. Leaves are slightly warmed and applied to chest for pneumonia.</td>
</tr>
<tr>
<td>9</td>
<td>Ageratum conyzoides L.</td>
<td>Asteraceae</td>
<td>Ochunti</td>
<td>Leaf</td>
<td>Cuts and wounds (to stop bleeding), acne, skin diseases, fever. Crushed leaves are applied to cuts and wounds, acne, and areas affected in skin diseases. Sherbet prepared from leaf juice is taken for fever (both therapeutic and preventive).</td>
</tr>
<tr>
<td>10</td>
<td>Blumea lacera DC.</td>
<td>Asteraceae</td>
<td>Sheal moti</td>
<td>Leaf, root</td>
<td>Fever, bleeding due to hemorrhoids, diarrhea. Boiled leaves are taken with a little amount of sugar for fever. Juice obtained from macerated leaves is taken like a sherbet to stop bleeding from hemorrhoids.</td>
</tr>
</tbody>
</table>
Crushed roots are taken for diarrhea.

11  **Eclipta alba** (L.) Hassk.  
   *Asteraceae*  
   Kaligamusa, Kalo keshi  
   Leaf  
   Helminthiasis, hair loss, to blacken hair. Macerated leaves are orally taken for helminthiasis, and applied topically to scalp to prevent hair loss and blacken hair.

12  **Mikania cordata** (Burm.f.) B. L. Robinson  
   *Asteraceae*  
   Malaria lota, Jarman lota  
   Leaf  
   Cuts and wounds (to stop bleeding), burns. Crushed leaves are applied.

13  **Synedrella nodiflora** (L.) Gaertn.  
   *Asteraceae*  
   Hola pat  
   Leaf  
   Jaundice, stomach disorders. Leaves are cooked and taken like a vegetable. Alternately, juice obtained from macerated leaves is taken with a little garlic and honey.

14  **Tagetes erecta** L.  
   *Asteraceae*  
   Ganda ful  
   Leaf, flower  
   Colds, coughs, hemorrhoids, constipation. Boiled leaves are taken for coughs and colds. Juice obtained from macerated leaves and flowers is applied to hemorrhoids to stop bleeding and orally taken as laxative.

15  **Ananas comosus** (L.) Merr.  
   *Bromeliaceae*  
   Anarosh  
   Leaf, fruit  
   Helminthiasis, fever, cold, coughs. Fruits are eaten during fever, colds and coughs. The whitish portion from the bottom of leaves is macerated to obtain juice, which is orally administered for helminthiasis.

16  **Opuntia dillenii** (Ker-Gawl.) Haw.  
   *Cactaceae*  
   Foni monsha  
   Leaf  
   Prickly heat, dandruff. Water in which leaves have been boiled is used to wash hair for dandruff. The same water is used for bathing to get rid of prickly heat (small eruptions on skin due to heat which itches).

17  **Canna indica** L.  
   *Cannaceae*  
   Kola boti  
   Root, rhizome  
   Fever, loss of appetite, skin diseases. Crushed roots are strained through a piece of cloth and the juice obtained taken for fever and loss of appetite. Macerated mix of roots and rhizomes is applied to affected areas of skin for skin disorders.

18  **Carica papaya** L.  
   *Caricaceae*  
   Papay  
   Fruit  
   Burning sensations and pain in the stomach, loss of appetite, indigestion. Raw fruits are cooked and taken as vegetable.

19  **Mesua ferrea** L.  
   *Clusiaceae*  
   Nageshwar  
   Leaf, fruit, seed  
   Burning sensations in hands or feet, joint pain, cold. Dried and powdered leaves and fruits are mixed with a little amount of ghee (clarified butter) and applied topically to hands or legs for burning sensations. For joint pain, crushed seeds mixed with oil are applied to joints. Macerated leaves are mixed with coconut oil and applied to head both for treatment and prevention of cold.

20  **Quisqualis indica** L.  
   *Combretaceae*  
   Madhibi lota  
   Leaf, root  
   Helminthiasis, gastrointestinal disorders. Juice obtained from macerated leaves and roots is orally administered for helminthiasis. Leaves are taken orally for gastrointestinal disorders.

21  **Terminalia chebula** Retz.  
   *Combretaceae*  
   Hortoki  
   Fruit (dried)  
   Vomiting tendency, constipation, skin diseases. Dried fruits are taken with a little honey for vomiting tendency; dried and powdered fruits are mixed with
<table>
<thead>
<tr>
<th></th>
<th>Scientific Name</th>
<th>Family</th>
<th>Part Used</th>
<th>Medicinal Use</th>
</tr>
</thead>
</table>
| 22| *Ipomoea aquatica* Forsk. | Convolvulaceae | Kolmi shak | Leaf, root, flower  
Jaundice, diarrhea, skin diseases.  
Boiled leaves are eaten as vegetable. Macerated leaves and flowers are applied with turmeric to affected areas of skin in skin diseases. Macerated roots are taken with honey for jaundice and diarrhea till cure. |
| 23| *Kalanchoe pinnata* (Lam.) Pers. | Crassulaceae | Pathorkuchi | Leaf  
Diarrhea, cuts and wounds.  
Leaves are chewed alone or with a little salt to stop diarrhea.  
Crushed leaves are applied topically to cuts and wounds. |
| 24| *Coccinia grandis* (L.) J. Voigt | Cucurbitaceae | Kola kochu | Leaf  
Diabetes, stomach pain. Juice obtained from squeezed leaves is taken with a little sugar for stomach pain. Only leaf juice is taken for diabetes. |
| 25| *Dillenia indica* L. | Dilleniaceae | Chalta | Leaf, fruit  
Loss of appetite, to prevent stomach upsets. Diarrhea, dysentery. Macerated young leaves are taken with a little honey to restore appetite. Juice obtained from fruits is taken to prevent stomach upsets and for treatment of diarrhea and dysentery. |
| 26| *Shorea robusta* C. F. Gaertn. (Smit) | Dipterocarpaceae | Shal | Leaf, seed  
Burns, joint pain. Crushed seeds are applied with a little oil to joint pain. Macerated leaves are applied to burns. |
| 27| *Phyllanthus amarus* Schumach. & Thonn. | Euphorbiaceae | Voiyom gach | Leaf  
Loss of appetite, diarrhea, dysentery, skin diseases. Crushed leaves are applied to affected areas of skin for skin diseases. Boiled leaves are taken for loss of appetite, diarrhea and dysentery. |
| 28| *Ricinus communis* L. | Euphorbiaceae | Varenda | Leaf, seed  
Rheumatic pain, joint pain, headache. Oil obtained from seeds is applied to affected areas for rheumatic and joint pains. Crushed mixture of leaves and seeds is applied to head for headache. |
| 29| *Cajanus cajan* (L.) Millsp. | Fabaceae | Orol gach | Leaf, seed  
Jaundice. Juice obtained from macerated leaves is taken with a little honey for jaundice. Seeds are cooked and taken like pulses. |
| 30| *Mimosa dioptricha* C. Wright ex Sauvalle | Fabaceae | Shada lojaboti | Root  
Jaundice, prevention of snake bite. Garland made from roots is worn around the neck for jaundice. Roots are put in an amulet and worn around the waist to prevent snake bites. |
| 31| *Mimosa pudica* L. | Fabaceae | Laal lojaboti | Root  
Jaundice, skin diseases. Garland of roots is worn around the neck for jaundice. Crushed roots of *Mimosa pudica* and rhizomes of *Curcuma longa* are applied in combination to affected areas during skin diseases. |
| 32| *Saraca indica* L. | Fabaceae | Ashok | Leaf, bark  
Sexual disorders, helminthiasis. Bark of *Saraca indica* are soaked in water and taken with a few cloves of *Allium sativum* for sexual disorders. Boiled leaves and barks are taken for helminthiasis. |
| 33| *Tamarindus indica* L. | Fabaceae | Tentul | Fruit  
Constipation, loss of appetite, diarrhea, chronic fever, |
<table>
<thead>
<tr>
<th>No.</th>
<th>Species Name</th>
<th>Family</th>
<th>Common Name</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td><em>Hyptis suaveolens</em> (L.) Poit.</td>
<td>Lamiaceae</td>
<td>Tokma</td>
<td>Seed</td>
</tr>
<tr>
<td>35</td>
<td><em>Ocimum americanum</em> L.</td>
<td>Lamiaceae</td>
<td>Tulshi</td>
<td>Leaf</td>
</tr>
<tr>
<td>36</td>
<td><em>Tectona grandis</em> L.f.</td>
<td>Lamiaceae</td>
<td>Shegun</td>
<td>Leaf, root, flower</td>
</tr>
<tr>
<td>37</td>
<td><em>Litsea monopetala</em> (Roxb.) Pers.</td>
<td>Lauraceae</td>
<td>Kajoli pata</td>
<td>Leaf</td>
</tr>
<tr>
<td>38</td>
<td><em>Allium sativum</em> L.</td>
<td>Liliaceae</td>
<td>Roshun</td>
<td>Clove</td>
</tr>
<tr>
<td>39</td>
<td><em>Lawsonia inermis</em> L.</td>
<td>Lythraceae</td>
<td>Mehedi</td>
<td>Leaf, fruit</td>
</tr>
<tr>
<td>40</td>
<td><em>Hibiscus rosa-sinensis</em> L.</td>
<td>Malvaceae</td>
<td>Joba</td>
<td>Leaf, root, flower</td>
</tr>
<tr>
<td>41</td>
<td><em>Azadirachta indica</em> A. Juss.</td>
<td>Meliaceae</td>
<td>Neem</td>
<td>Leaf, fruit</td>
</tr>
<tr>
<td>42</td>
<td><em>Ficus hispida</em> L.f.</td>
<td>Moraceae</td>
<td>Bohoi gach</td>
<td>Fruit</td>
</tr>
<tr>
<td>No.</td>
<td>Species</td>
<td>Family</td>
<td>Local Name</td>
<td>Part Used</td>
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</tr>
<tr>
<td>43</td>
<td><em>Ficus racemosa</em> L.</td>
<td>Moraceae</td>
<td>Dumur</td>
<td>Leaf, root, fruit</td>
</tr>
<tr>
<td>44</td>
<td><em>Psidium guajava</em> L.</td>
<td>Myrtaceae</td>
<td>Goya, Peyara</td>
<td>Leaf</td>
</tr>
<tr>
<td>45</td>
<td><em>Nymphaea nouchali</em> Burm.f.</td>
<td>Nymphaeaceae</td>
<td>Shada shapla</td>
<td>Leaf, flower, whole plant</td>
</tr>
<tr>
<td>46</td>
<td><em>Jasminum sambac</em> (L.) Aiton</td>
<td>Oleaceae</td>
<td>Beli ful</td>
<td>Leaf</td>
</tr>
<tr>
<td>47</td>
<td><em>Peperomia pellucida</em> (L.) Kunth.</td>
<td>Piperaceae</td>
<td>Luchi pata</td>
<td>Leaf</td>
</tr>
<tr>
<td>48</td>
<td><em>Cynodon dactylon</em> (L.) Pers.</td>
<td>Poaceae</td>
<td>Durba ghass</td>
<td>Whole plant</td>
</tr>
<tr>
<td>49</td>
<td><em>Eleusine indica</em> (L.) Gaertn.</td>
<td>Poaceae</td>
<td>Malonkuri</td>
<td>Leaf, root</td>
</tr>
<tr>
<td>50</td>
<td><em>Ixora coccinea</em> L.</td>
<td>Rubiaceae</td>
<td>Rongon</td>
<td>Root</td>
</tr>
<tr>
<td>51</td>
<td><em>Aegle marmelos</em> (L.) Corr.</td>
<td>Rutaceae</td>
<td>Bel</td>
<td>Leaf, fruit</td>
</tr>
<tr>
<td>52</td>
<td><em>Citrus aurantiifolia</em> (Christm.) Swingle</td>
<td>Rutaceae</td>
<td>Lebu</td>
<td>Leaf, fruit</td>
</tr>
<tr>
<td>53</td>
<td><em>Murraya paniculata</em> (L.) Jack</td>
<td>Rutaceae</td>
<td>Kamini</td>
<td>Leaf, stem</td>
</tr>
<tr>
<td>54</td>
<td><em>Litchi chinensis</em> Sonn.</td>
<td>Sapindaceae</td>
<td>Lichu</td>
<td>Leaf</td>
</tr>
<tr>
<td>Page</td>
<td>Species</td>
<td>Family</td>
<td>Part</td>
<td>Disease</td>
</tr>
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<td>----------------------------------</td>
</tr>
</tbody>
</table>
| 55   | *Datura metel* L.           | Solanaceae | Leaf, flower | Skin diseases, dandruff.  
Macerated mix of leaves and flowers are applied to skin for skin disorders till cure.  
Macerated leaves of *Datura metel* and *Lawsonia inermis* are applied to head for dandruff. |
| 56   | *Lycopersicon esculentum* Mill. | Solanaceae | Fruit | Indigestion, loss of appetite, blood purifier. Juice obtained from fruits is taken. |
| 57   | *Solanum sisymbriifolium* Lam. | Solanaceae | Leaf, root, flower | Wounds (to stop bleeding), skin diseases. Macerated flowers are applied to wounds. Macerated leaf and root mixture is applied to affected areas of skin for skin diseases. |
| 58   | *Abroma augusta* L.f.       | Sterculiaceae | Leaf, seed | Burning sensations during urination, dysentery, pain. Leaves are soaked in water and the water taken to get relief from burning sensations during urination. Leaves, soaked in water, are taken for dysentery. Crushed seeds are applied with a little oil to pain-affected areas. |
| 59   | *Christella arida* (D. Don) Holttum | Thelypteridaceae | Leaf, root | Dysentery, skin diseases. Young leaves are boiled in water and taken with a little honey for dysentery. Crushed roots of *Christella arida* and rhizomes of *Curcuma longa* are applied in combination to affected areas in skin diseases. |
| 60   | *Trema orientalis* (L.) Blume | Ulmaceae | Leaf, stem, root | Pain, epilepsy, diarrhea. Boiled leaves are orally administered for diarrhea. Boiled leaves and roots are orally administered for epilepsy. Crushed young stems are applied to painful areas. |
| 61   | *Centella asiatica* (L.) Urb. | Umbelliferae | Leaf | Dysentery, dysentery. Juice obtained from macerated leaves is taken. Alternately, leaves are macerated with a little amount of any lentil, fried in oil and eaten. |
| 62   | *Curcuma longa* L.          | Zingiberaceae | Rhizome | Helminthiasis, skin diseases, loss of appetite, to increase memory. Juice obtained from macerated rhizomes is taken in the morning on an empty stomach for helminthiasis. Macerated rhizomes are applied to skin for skin diseases. Crushed rhizomes are taken with warm milk to improve memory and restore appetite. Skin diseases. Macerated leaves of *Jasminum sambac* and rhizomes of *Curcuma longa* are applied to affected areas of skin in skin diseases. Skin diseases. Crushed roots of *Mimosa pudica* and rhizomes of *Curcuma longa* are applied in combination to affected areas during skin diseases. Skin diseases. Crushed roots of *Christella arida* and rhizomes of *Curcuma longa* are applied in combination to affected areas in skin diseases. |
| 63   | *Curcuma zedoaria* (Christm.) Roscoe | Zingiberaceae | Leaf, rhizome | Helminthiasis, headache, to improve eyesight. Macerated leaves are mixed with lime water (water containing calcium hydroxide) and orally applied for skin diseases. |
A combination of plants (usually parts from two plants) was also used by the Kaviraj for treatment. Cloves of *Allium sativum* were mixed with leaves of *Justicia adhatoda* for treatment of joint pain, and mixed with bark of *Saraca indica* for treatment of sexual disorders. Rhizomes of *Curcuma longa* were used by themselves for treatment of helminthiasis and skin diseases, or mixed with leaves of *Jasminum sambac*, roots of *Mimosa pudica* or roots of *Christella arida* for treatment of various skin diseases.

Besides oral and topical applications, a plant part may also be used to wear as a garland or put in an amulet to be worn around the body. Roots of *Mimosa diplostichra* were advised to be worn around the neck as a garland as treatment for jaundice. Roots of the same plant were put in an amulet and worn around the waist to protect a person from being bitten by snakes. Roots of *Mimosa pudica* were also advised to be worn around the neck as a garland for treatment of jaundice. In both cases, garlands were made by tying a number of roots with a string and then hanging it loosely around the neck. The garland can be taken off during bathing, but an amulet has to be worn all the time till cure.

Lately, interest has focused on the practices of traditional medicinal practitioners by the scientific community in their efforts to find safer and better drugs. As a result of this interest and concomitant scientific research, more and more plants are being validated through scientific evidence in their traditional uses. For instance, *Justicia adhatoda*, which was advised by the Kasipur Kaviraj to be orally administered for respiratory difficulties and asthma, contains alkaloids with positive effects on inflammatory diseases (Chakraborty and Brantner, 2001); extract of the plant also has been shown to have anti-tussive effect (Dhuley, 1999), and a bronchodilator alkaloid (vasicinone) has been isolated from the plant (Mehta and Amin, 1959). Anti-diabetic activity of the plant * Catharanthus roseus* has been mentioned in a number of reports (Islam *et al.*, 2009; Rasineni *et al.*, 2010; Gacche and Dhole, 2011). It can be said with a certain degree of confidence that more medicinal plants used by the Kavirajes will be validated in their uses by scientific evidences once their relevant bio-activities has been studied. Many modern medicines are plant-based and their discoveries were made possible through observations of the medical practices of indigenous peoples (Cotton, 1996). It is expected that the same trend will continue in the future.

**References**


Gacche, R.N. and N.A. Dhole, 2011. Profile of aldose reductase inhibition, anti-cataract and free radical scavenging activity of selected medicinal plants: an attempt to standardize the botanicals for amelioration of diabetes complications. Food and Chemical Toxicology, 49: 1806-1813.


