Study of medicinal plants in a flood plain wetland in Barpeta district, Assam, India

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Abstract

This paper presents the medicinally important macrophytes of Kapla beel a freshwater flood plain wetland. The Kapla beel is located in Barpeta district of lower Assam. The macrophyte community comprised of 36 species belong to 24 families. The study showed 13 plant species have medicinal properties namely Acorus calamus L, Sagittaria sagittifolia L, Typha latifolia L, Sparganium erectum L, Lemna minor L, Spirodella polyrrhiza (L) Schleid, Vallisneria spiralis L, Hydrilla verticillata (L.F.) Royle., Mentha aquatica L, Polygonum amphibium L, Trapa bispinosa L, Eichhornia crassipes (Mart.) solms and Nelumbo nucifera. Gartner. The study indicates the importance of conservation of aquatic vegetation of flood plain wetland in Assam. The conservation efforts of aquatic vegetation will facilitate the conservation of medicinal plants too.

Keywords : Kapla beel, Medicinal plants.

1. Introduction

Aquatic macrophytes are of utmost ecological and economic importance in wetland ecosystem. They mobilize mineral elements and provide shelter to aquatic invertebrate and vertebrate animal community. They also produce enormous biomass and play an important role in productivity and nutrient cycle of the wetland ecosystem. From economical point of view the aquatic plants provide food, medicine, fibre, craft and animal fodder. Different studies have recorded that among the aquatic macrophytes, a considerable amount constitute medicinal plants (Kirtikar and Basu, 1993; Nandakari, 1994; Kim et al., 1997; Rahman et al., 2000, 2001; Kar et al., 2004; Baral and Kurmi, 2006; Gyawali and Kim, 2009; Mohammad et al., 2011). Since there are scanty reports on medicinal plants of flood plain wetlands, the present study was undertaken to investigate the different medicinal plants in Kapla beel, a freshwater perennial wetland in Barpeta district, Assam.

2. Study Area

Kapla beel is a freshwater flood plain wetland located in Barpeta district of Assam. It lies at the intersection of 26°15′ – 26°30′ N latitude and 91°00′ – 91°15′ E longitude. Kapla beel covers an area of about 91 hectares and it is located about 120 Km away from Guwahati city towards west. The average annual minimum and maximum temperature ranges between 16°C–32°C and rainfall about 2000 mm.

3. Materials and Methods

For the present study the Kapla beel area was arbitrarily divided into five zones i.e. North, South, East, West and Central zone. The
The result of macrophyte analysis of Kapla beel is presented in Table-1. The macrophyte community comprised of 24 families represented by 36 species occupying emergent floating and submerged habitat. Out of 36 species 13 macrophyte species are medicinal plants possessing different medicinal properties for various types of ailments. These includes—

### Table - 1 : Medicinal Plants of Kapla beel (Wetland)

<table>
<thead>
<tr>
<th>TAXON</th>
<th>FAMILY</th>
<th>NAME OF MACROPHYTES</th>
<th>HABITAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Araceae</td>
<td>Acorus calamus L.</td>
<td>Emergent</td>
<td></td>
</tr>
<tr>
<td>Alismataceae</td>
<td>Sagittaria sagittifolia L.</td>
<td>Emergent</td>
<td></td>
</tr>
<tr>
<td>Typhaceae</td>
<td>Typha latifolia L.</td>
<td>Emergent</td>
<td></td>
</tr>
<tr>
<td>Sparganiaceae</td>
<td>Sparganium erectum L.</td>
<td>Emergent</td>
<td></td>
</tr>
<tr>
<td>Lemnaceae</td>
<td>Lemma minor L.</td>
<td>Floating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spirodella polyrrhiza (L) schleid</td>
<td>Floating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vallisneria spiralis L.</td>
<td>Submerged</td>
<td></td>
</tr>
<tr>
<td>Hydrochariataceae</td>
<td>Hydrilla verticellata (L.F.) Royle</td>
<td>Submerged</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lamiaceae</td>
<td>Mentha aquatica L.</td>
<td>Emergent</td>
<td></td>
</tr>
<tr>
<td>Nymphaeaceae</td>
<td>Nelumbo nucifera Gartner</td>
<td>Floating</td>
<td></td>
</tr>
<tr>
<td>Polygonaceae</td>
<td>Polygonum amphibium L.</td>
<td>Floating</td>
<td></td>
</tr>
<tr>
<td>Trapaceae</td>
<td>Trapa bispinosa L.</td>
<td>Floating</td>
<td></td>
</tr>
<tr>
<td>Pontederiaceae</td>
<td>Eichhornia crassipes (Mart) solms</td>
<td>Floating</td>
<td></td>
</tr>
</tbody>
</table>

#### 4.1. Acorus calamus L.

It is a perennial aquatic plant. The leaves are sword shaped, smooth glossy and fresh green. Rhizome of this plant is used for relief of toothache, headache and the ancient Chinese people used it to lessen swelling, for constipation, to cure fever, asthma and bronchitis. The plant is used as air purifier, rhizome is used in the treatment of cough, asthma, fever, diarrhea and dysentery, (Saharia and Sarma, 2011). It has antiseptic, antimicrobial, sedative, analgesic and anti inflammatory and anti tumor properties (Gyawali and Kim, 2009).

#### 4.2. Typha latifolia L.

A perennial aquatic plant. The leaves are up to 2 m long and 2.5 cm broad and bluish green in colour. The plant has food and medicinal value. Leaves are used for diuretic (Duke and Ayensu, 1985). Pollen of this plant is used as astringent
and used in diuretic and sedative purposes. Dried pollen is anticoagulant and used in the treatment of kidney stone, haemorrhage, painful menstruation, abnormal uterine bleeding, cancer of lymphatic system (Foster and Duke, 1990; Hussain et al., 2010) Typha latifolia is also used in the treatment of tapeworm, diarrhea and whooping cough (Moreman, 1998).

4.3. *Lemna minor* L

It is small floating perennial plant consisting of a round or egg shaped thalli, mostly 2-3 mm in diameter, flat dark green above and lighter below. The whole plant has antidiuretic and depurative properties. It is also used in the treatment of skin diseases. It acts specially on nostrils in the diseases like rhinitis, polypi etc. (Boericke, 2007).

4.4 *Spirodella polyrrhiza* (L) Schleid

It is free floating, shiny green on upper surface and usually red on lower surface. *Spirodella polyrrhiza* is used as Chinese medicinal herb for diuretic effect, reducing swelling and reducing perspiration (Zi ping shu, 2010).

4.5. *Vallisneria spiralis* L

It is used as appetizer, refrigerant, demulcent and women complaint (leucorrhoea) and used for stomachache (Stuart, 2003; Duke and Ayensu, 1985; Chopra et al., 1986)

4.6. *Hydrilla verticellata* (L. F.) Royle

It is a rooted submerged perennial aquatic plant. It has long stem and leaves are generally small. It is used in the treatment of abscesses and boil and wounds. A dried powder of the plant is applied to cuts and wounds that helps to accelerate healing. The plant contains oletiona A and B attributing to antitumor and antibacterial activity (Pal et al., 2004). The plant also helps in detoxification, blood circulation, diabetes and neurological health (Pal et al., 2005).

4.7. *Mentha aquatica* L

It is a submerged aquatic plant. The stalked leaves are egg shaped, jaw edged, hairy and in crossed pairs and attain 60-100 cm length. It is used for the treatment of stomach and intestinal complaints, migraine and other troubles (Bursche, 1991). The leaves are used in fever, headache and digestive disorders (Foster and Duke, 1990). The plant part is useful in sore throat, ulcers and bad breath (Launert, 1981). It is believed that the plant possesses antiseptic, antispasmodic, astringent, carminative, emetic, cholagogue and diaphoretic properties and other medicinal properties are refrigerant, stimulant, stomachic and vasodilator. (Lust, 1979).

4.8. *Nelumbo nucifera* Gartner

Lotus seeds are used to treat weak sexual function in men and leucorrhoea in women and diarrhea. The green embryo is used to reduce blood pressure. The plant is used in piles and hearty disorder. (Rothe, 2011). Lotus leaves are beneficial to stomach, spleen and liver and assist in lowering blood lipids. Lotus stamens benefiting the heart and kidney. It is mainly used for preventing white discharge such as treatment of leucorrhoea or for frequent urination. All parts of the lotus have some anti haemorrhagic effect (Dharmananda, 1993). Lotus fruits are used in cardiac treatment (Saharia and Sarma, 2011)

4.9. *Polygonum amphibium* L

It has long (up to 1 m) stalked floating leaves bluntly tapering at the top, it is glossy, dark green and leathery. Fresh roots applied directly to cure the blisters in the mouth (Leighton, 1985). Infusion of dried, pounded roots or raw root eaten for eradication of chest cold (Turner et al., 1980). Flowers used as bait for trout fishing (Steedman, 1928). Roots used for mouth sores (Smith, 1928). Infusion of plants used for stomach pain (Smith, 1932).

4.10. *Trapa bispinosa* L

It is a perennial floating plant. The leaves are leathery, stalked with a rhombic, toothed leaf blade. The extract of *Trapa bispinosa* inhibit microbial growth, and juice used for diarrhea and dysentery. The fruit is used in inflammation, urinary diseases, fracture, sore throat, bronchitis, leucorrhoea and malaria (Mohammad et al., 2011). The herb has been used for hepato protective activity (Kar et al., 2004). The whole
herb and fruit have antimicrobial and antibacterial activity (Rahman et al., 2000, 2001), anti tumour activity (Irikura et al., 1972) and free radical scavenging activity (Kim et al., 1997). Further the fruits have been used as anti inflammatory in leprosy, urinary discharge, fractures, sore throat, bronchitis and anaemia (Kirtikar and Basu, 1993).

4.11. *Eichhornia crassipes* (Mart.) solms

It is a free floating (but sometimes rooted) amphibian perennial freshwater plant. It can be used for the treatment of swelling, goiter, burning sensation, haemorrhage and general debility. The neighbouring people of Kapla beel use *Eichhornia crassipes* to prepare a medicine locally called ‘Dakhala khar’ (Alkali) which is used specially for the treatment of indigestion and to improve appetite. The plant has antifungal and antimicrobial properties. (Thamaraiselvi et al., 2012).

4.12. *Sparganium erectum* L.

The plant may reach 20-70 cm high. The leaves are distinctly keeled, triangular at the base. An infusion of this plant can be mixed with other leaves and used in the treatment of chills. The plant possess medicinal value as anti scorbatic and diuretic. The plant has astringent properties. (Moerman,1998).

4.13. *Sagittaria sagittifolia* L.

It is a herbaceous perennial plant. The leaves are arrow shaped. This plant exhibits antibacterial activity (Devi and Ramasubramaniraja, 2009) and antiscorbutic and diuretic properties. (Grieve, 1971; Duke and Ayensu, 1985).

The above study clearly showed that flood plain wetlands harbour a large number of medicinal plants of immense medicinal value. In Assam there are 3474 wetlands and they certainly shelter huge volume of medicinal plants with various medicinal properties. Therefore, the present study emphasize the need for extensive evaluation of medicinal plants of wetlands across Assam and other Northeastern states. Further the study also indicates the need for undertaking vigorous conservation measures to protect the wetland aquatic plants in general and medicinal plants in particular.
References


