Ethnomedicinal aspects of some weeds from paddy fields of Villupuram district in Tamil Nadu, India

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ABSTRACT

The present investigation has been carried out to enumerate the ethnomedicinal plant growing in the paddy field of Villupuram district, Tamil Nadu. Ten selected sites in the Villupuram district was taken for investigation. Random quadrate method was adapted for studying the phytosociological attributes of the weeds. A total of 145 plant species belonging to 22 families were identified, out of which 39 plant species are medicinally important to cure different diseases in human beings directly. Amaranthaceae and Euphorbiaceae was the dominant family seen during observation. Frequency, Relative frequency, Density, Relative density, Abundance, Relative abundance and Important Value Index (IVI) of the species were calculated.

Keywords: Ethnomedicine; Paddy field; Frequency; Density; Important Value Index (IVI)

1. INTRODUCTION

Plants are generally rich sources of many natural herbal products which have mostly used for human welfare especially in tonic to loss of viability and also reduce the human pain and suffering from many diseases. From the ancient period man has been used several different plants to cure all body pain and different diseases. Now-a-days throughout the world several thousands of plants mostly weed plants are medicinal but very few drug plant are cultivated (Upma Dobhal et al., 2006). Many of the drug used in modern medicine were initially used in crude form in traditional uses and other useful biological activity (Iwu et al., 1999). Ethnobotany is the study of the relationship between plants and people. Quite a number of plants considered as weeds in modern sciences have significant value in ethnobotany. Weeds are very common, dominant and widespread in the crop fields. Paddy is the most important cereal crop in Tamil Nadu, which contributes nearly 20 % to the gross domestic agricultural product and provides more than 50 % of total calorie requirement to the Tamil Nadu people. Weeds are genetically liable and phenotypically plastic; such characters enable them to pass through successfully in adverse habitats. They easily invade crop fields which are favourite grounds for their quick growth. The presence of weeds in the fields and their impact on the crop production and environment has been well documented (Randall 1996; Frohlich et al., 2000; Hassan and Marwat 2001). Role of weeds in ayurvedic medicine...
was described by Govindiah (1981). Nath et al. (2007) described ethnomedicinal aspects of 38 species of weeds of Darrang district of Assam. Leena Sharma (2010) described the weeds of Rajasthan and their ethnobotanical importance.

2. MATERIALS AND METHODS

2.1. Study area

The Villupuram district extends over an area of 8204.63 sq. Km is situated in the south eastern portion of Tamil Nadu. It is bounded on the north by Thiruvannamalai and Kanchipuram districts on the east by the Bay of Bengal, on the south by the district of Cuddalore and on the west by Salem and a part of Dharmapuri districts. The average maximum and minimum temperature ranges from 32.78 °C to 24.08 °C respectively. The district lies between 11° 57' N latitude and 79° 32' E longitude.

2.2. Methodology

Present study was conducted in ten selected sites of Villupuram district in the paddy crop fields. Random quadrate method was adopted for studying phytosociological attributes of weeds. Quadrate of 1 x 1 m were laid down and hence a sum of 60 quadrates was laid. All the weeds from each quadrate were collected separately in polythene bags. The information regarding the local name, plant parts used, name of the diseases cured and the process of administration were collected with the help of rural people, village vaidyas and aged elders. A questionnaire was prepared in the local language for collection of ethic information and interviews were conducted. The collection of information was accompanied by the collection of voucher specimens. The plants were pressed, following the standard technique (Cunningham, 2001). Identification of collected specimens was done with the help of literature. Ethnomedicinal data obtained in the field were complied and compared with the published references of Srivastava et al. (2000), Prajapathi and Khana (2004) and Jadeja et al. (2004). Frequency, Relative frequency, Density, Relative density, Abundance, Relative abundance and Importance Value Index of the species were calculated.

\[
\text{Frequency} (\%) = \frac{\text{Total number of quadrats in which the species occur}}{\text{Total number of quadrats studied}} \times 100
\]

\[
\text{Relative Frequency} (\%) = \frac{\text{Frequency of individuals of a species}}{\text{Total frequency of all species}} \times 100
\]

\[
\text{Density} = \frac{\text{Total number of individuals of a species in all quadrats}}{\text{Total number of quadrats studied}}
\]

\[
\text{Relative Density} (\%) = \frac{\text{Density of individuals of a species}}{\text{Total density of all species}} \times 100
\]

\[
\text{Abundance} = \frac{\text{Total number of individuals of a species in all quadrats}}{\text{Total number of quadrats in which the species occurred}}
\]

\[
\text{Relative abundance} (\%) = \frac{\text{Abundance of individuals of a species}}{\text{Total abundance of all species}} \times 100
\]
Importance Value Index = Relative density + Relative frequency + Relative abundance

3. RESULTS AND DISCUSSION

Present study is undertaken with a view to explore the source, purpose and method of use of different plant resources of Villupuram district. The present survey was done to record the overall relationship of the local people with plant resources. The information obtained from the various source of the area of study has been given in the table 1. Observation indicated that weed species collected from crop fields are being used to cure different human diseases.

Table. 1 Survey of ethnomedicinal plants in the paddy field.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Botanical name</th>
<th>Family</th>
<th>Vernacular name</th>
<th>Parts used</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Acalypha indica L.</td>
<td>Euphorbiaceae</td>
<td>Kuppaimaeni</td>
<td>Whole plant</td>
<td>Anthelmantitic, Ulcers</td>
</tr>
<tr>
<td>2.</td>
<td>Achyranthes aspera L.</td>
<td>Amaranthaceae</td>
<td>Naayuruvi</td>
<td>Leaves, seeds</td>
<td>Urinary and skin diseases</td>
</tr>
<tr>
<td>3.</td>
<td>Adhatoda zeylanica Nees.</td>
<td>Acanthaceae</td>
<td>Adhatoda</td>
<td>Leaves, roots</td>
<td>Tuberculosis, Ulcer, Piles</td>
</tr>
<tr>
<td>4.</td>
<td>Alternanthera sessilis R.br.ex D C</td>
<td>Amaranthaceae</td>
<td>Ponnaankanni</td>
<td>Whole plant</td>
<td>Eye diseases, body cool, Ulcer</td>
</tr>
<tr>
<td>5.</td>
<td>Amaranthus spinosus L.</td>
<td>Amaranthaceae</td>
<td>Mullukeerai</td>
<td>Whole plant</td>
<td>Mouthwash, Toothache</td>
</tr>
<tr>
<td>6.</td>
<td>Amaranthus tricolor L.</td>
<td>Amaranthaceae</td>
<td>Thandukeerai</td>
<td>Leaves, roots</td>
<td>Blood pressure</td>
</tr>
<tr>
<td>7.</td>
<td>Amaranthus viridis L.</td>
<td>Amaranthaceae</td>
<td>Kuppaikerai</td>
<td>Leaves, roots</td>
<td>Skin diseases, Blood pressure</td>
</tr>
<tr>
<td>8.</td>
<td>Boerrhavia diffusa L.</td>
<td>Nyctaginaceae</td>
<td>Moorkaratai</td>
<td>Whole plant</td>
<td>Eye infection, Anaemia</td>
</tr>
<tr>
<td>9.</td>
<td>Cardiospermum helicacabum L.</td>
<td>Sapindaceae</td>
<td>Modakkanchor</td>
<td>Whole plant</td>
<td>Fever, Eye complaints</td>
</tr>
<tr>
<td>10.</td>
<td>Centella asiatica Urb.</td>
<td>Apiaceae</td>
<td>Vallaarai</td>
<td>Whole plant</td>
<td>Cooling, carminative, Asthma</td>
</tr>
<tr>
<td>11.</td>
<td>Chloris barbata Sw.</td>
<td>Poaceae</td>
<td>Corapillu</td>
<td>Roots</td>
<td>Cold, Rheumatism</td>
</tr>
<tr>
<td>12.</td>
<td>Cleome viscosa L.</td>
<td>Cleomaceae</td>
<td>Vaelaikkeerai</td>
<td>Whole plant</td>
<td>Wounds, Ulcer, Earache</td>
</tr>
<tr>
<td>13.</td>
<td>Croton sparciflorus Mor.</td>
<td>Euphorbiaceae</td>
<td>Railpoondu</td>
<td>Roots</td>
<td>Cough, Fever, Vomitting</td>
</tr>
<tr>
<td>15.</td>
<td>Commelina bhengalensis Schult. F.</td>
<td>Commelinaceae</td>
<td>Kaanaakuzhai</td>
<td>Whole plant</td>
<td>Cancer, Ulcer, Skin diseases</td>
</tr>
<tr>
<td>16.</td>
<td>Cyperus rotundus L.</td>
<td>Cyperaceae</td>
<td>Koraipil</td>
<td>Whole plant</td>
<td>Vomitting, Wounds</td>
</tr>
<tr>
<td>No.</td>
<td>Scientific Name</td>
<td>Family</td>
<td>Common Name</td>
<td>Part Used</td>
<td>Uses</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------</td>
<td>------------------</td>
<td>-----------------------</td>
<td>-----------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>17</td>
<td><em>Cyperus scariosus</em> R. br.</td>
<td>Cyperaceae</td>
<td>Poonkorai</td>
<td>Tubers</td>
<td>Stomach pain, Washing hair</td>
</tr>
<tr>
<td>18</td>
<td><em>Eclipta alba</em> Hassk.</td>
<td>Asteraceae</td>
<td>Karisalaankanni</td>
<td>Whole plant</td>
<td>Chronic diseases, Cough</td>
</tr>
<tr>
<td>19</td>
<td><em>Euphorbia hirta</em> L.</td>
<td>Euphorbiaceae</td>
<td>Ammanpacharisi</td>
<td>Whole plant</td>
<td>Cough, breast pain, asthma</td>
</tr>
<tr>
<td>20</td>
<td><em>Heliotropium indicum</em> L.</td>
<td>Boraginaceae</td>
<td>Siruthaelkodukku</td>
<td>Whole plant</td>
<td>Cough, Fever, Wounds</td>
</tr>
<tr>
<td>21</td>
<td><em>Hygrophila auriculata</em> L.</td>
<td>Acanthaceae</td>
<td>Neermuli</td>
<td>Roots, Seeds</td>
<td>Rheumatism, eye diseases</td>
</tr>
<tr>
<td>22</td>
<td><em>Leucas aspera</em> Spr.</td>
<td>Lamiaceae</td>
<td>Thumbai</td>
<td>Leaves, flowers</td>
<td>Dyspepsia, Verminosis</td>
</tr>
<tr>
<td>24</td>
<td><em>Marsilea minuta</em> L.</td>
<td>Marsileaceae</td>
<td>Aarakkeerai</td>
<td>Tubers, leaves</td>
<td>Anti-inflammatory, diuretic</td>
</tr>
<tr>
<td>25</td>
<td><em>Mullugo oppositifolia</em> L.</td>
<td>Aizoaceae</td>
<td>Paarpadagam</td>
<td>Whole plant</td>
<td>Dysentry</td>
</tr>
<tr>
<td>26</td>
<td><em>Mukia maderaspatana</em> Cogn.</td>
<td>Cucurbitaceae</td>
<td>Musumusukkai</td>
<td>Leaves, Seeds</td>
<td>Chronic diseases, cough</td>
</tr>
<tr>
<td>27</td>
<td><em>Ocimum canum</em> Sims.</td>
<td>Lamiaceae</td>
<td>Naathulasi</td>
<td>Whole plant</td>
<td>Cough, Dysentry</td>
</tr>
<tr>
<td>28</td>
<td><em>Portulaca oleracea</em> L.</td>
<td>Portulacaceae</td>
<td>Pasalai</td>
<td>Leaves</td>
<td>Dysentry, Haemorrhoids</td>
</tr>
<tr>
<td>29</td>
<td><em>Phyllanthus amarus</em> L.</td>
<td>Euphorbiaceae</td>
<td>Keelanelli</td>
<td>Whole plant</td>
<td>Stomach pain, Ulcer, fever</td>
</tr>
<tr>
<td>30</td>
<td><em>Physalis minima</em> L.</td>
<td>Solanaceae</td>
<td>Thothakkali</td>
<td>Whole plant</td>
<td>Urinary purgative</td>
</tr>
<tr>
<td>31</td>
<td><em>Ricinus communis</em> L.</td>
<td>Euphorbiaceae</td>
<td>Aamanakku</td>
<td>Leaves, roots</td>
<td>Pilles, cough, headache</td>
</tr>
<tr>
<td>32</td>
<td><em>Sida acuta</em> Burm.</td>
<td>Malvaceae</td>
<td>Arivaalmunai poondu</td>
<td>Leaves, flowers</td>
<td>Swelling, Blood clot</td>
</tr>
<tr>
<td>33</td>
<td><em>Solanum nigrum</em> L.</td>
<td>Solanaceae</td>
<td>Manathakkaali</td>
<td>Leaves, roots</td>
<td>Ulcers, burning sensation</td>
</tr>
<tr>
<td>34</td>
<td><em>Solanum trilobatum</em> L.</td>
<td>Solanaceae</td>
<td>Thoodhuvalai</td>
<td>Leaves</td>
<td>Cold, Pain, Cough</td>
</tr>
<tr>
<td>35</td>
<td><em>Solanum xanthocarpum</em> Sch.&amp; Wendl.</td>
<td>Solanaceae</td>
<td>Kandankathiri</td>
<td>Whole plant</td>
<td>Cough, Stomach pain, Asthma</td>
</tr>
<tr>
<td>36</td>
<td><em>Toddalia asiatica</em> Lam.</td>
<td>Rutaceae</td>
<td>Milaharani</td>
<td>Roots, leaves</td>
<td>Skin diseases, Piles, Cough</td>
</tr>
<tr>
<td>37</td>
<td><em>Tribulus terrestris</em> L.</td>
<td>Zygophyllaceae</td>
<td>Nerinji</td>
<td>Fruits</td>
<td>Crystalluria, Urolithiasis</td>
</tr>
<tr>
<td>38</td>
<td><em>Tridax procumbens</em> L.</td>
<td>Asteraceae</td>
<td>Vettukaya poondu</td>
<td>Whole plant</td>
<td>Ulcer, Antiseptic</td>
</tr>
<tr>
<td>39</td>
<td><em>Vernonia cinerea</em> Less.</td>
<td>Asteraceae</td>
<td>Neisurutti</td>
<td>Roots, leaves</td>
<td>Wounds, Rheumatism</td>
</tr>
</tbody>
</table>
Fig. 1. Frequency (%) percentage of some weeds in paddy fields.

- Acalypha indica L.
- Achyranthes aspera L.
- Adhatoda zeylanica Nees.
- Alternanthera sessilis R.br.
- Amaranthus spinosus L.
- Amaranthus tricolor L.
- Amaranthus viridis L.
- Boerrhavia diffusa L.
- Cardiospermum indicum L.
- Centella asiatica Urb.
- Chloris barbata Sw.
- Cleome viscosa L.
- Croton sparsiflorus Mor.
- Cynodon dactylon Pers.
- Commelina bengalensis Schult. F.
- Cyperus rotundus L.
- Cyperus scarious R.br.
- Echipta alba Hassk.
- Euphorbia hirta L.
- Heliotropium indicum L.
- Hygrophila auriculata L.
- Leucas aspera Spr.
- Lippia nudiflora Mich.
- Marsilea minuta L.
- Mullugo oppositifolia L.
- Musa maderaspatana Cogn.
- Ocimum canum Sims.
- Oxalis corniculata L.
- Phyllanthus amarus L.
- Physalis minima L.
- Portulaca oleracea L.
- Ricinus communis L.
- Sida acuta Burm.
- Solanum nigrum L.
- Solanum trilobatum L.
- Solanum xanthocarpum Sch.&z.
- Tribulus terrestris L.
- Tridax procumbens L.
- Vernonia cinerea Less.
Fig. 2. Density percentage of some weeds in paddy fields.
Fig. 3. Abundance percentage of some weeds in paddy fields.
Fig. 4. Importance Value Index percentage of some weeds in paddy fields.
Out of 145 weeds studied, 39 weeds are of medicinally important and useful to cure various diseases.

Amaranthaceae and Euphorbiaceae was the dominant families present with five genera, Solanaceae (4), Asteraceae (3), Lamiaceae (2), Acanthaceae (2), Poaceae (2), Cyperaceae (2) followed by Verbinaceae, Cucurbitaceae, Malvaceae, Cleomaceae, Nyctaginaceae, Sapindaceae, Apiaceae, Commelinaceae, Boraginaceae, Marsileaceae, Aizoaceae, Portulaceae, Rutaceae and Zygophyllaceae. Important value index was high in *Chloris barbata* Sw., *Cynodon dactylon* Pers., *Cyperus rotundus* L., *Cyperus scariosus* R. br. *Leucas aspera* Spr. *Marsilea minuta* L. and *Physalis minima* L. Phytosociological attributes of paddy field is given in Fig. 1, 2, 3 and 4.

On the traditional uses of weeds a little work has been carried out in India. Weeds play an important role in ayurvedic medicine. Saikia and Hussain (2005) collected information on medicinal aspects of some weeds used by the Ahan and Khamti communities of Sivasagar. The present report coincides with the earlier reports of Adiseshu (1997), Tomar (2009) and Prayagamurthy (2009). Workers like Dangwal *et al.* (2010) and Perira (1998) have worked on weed flora and their management in other areas of India.

4. CONCLUSION

Indian council of agriculture has recommended that proper utilization of weeds itself can contribute significantly to enhance the income of poor farmers. Weeds are tremendously grown in open areas and people are not aware for medicinal value of weeds. On the other hand India is a leading exporter of the medicinal plants in the world trade. So, one should understand the importance of weeds. It may be useful for taxonomists, agriculturists and scientists involved in the management of weeds. Awareness should be carried out to the local peoples to use these weeds as medicine and to practice them in their day today life. The various uses of these weeds may aid dealers in crude drugs manufactures of plant products or persons interested in the beneficial aspects of plants. Hence it is concluded that weeds present in the paddy fields can be used as medicine directly or in ayurvedic medicine in large scale.

References


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