Folk Medicinal Uses of the Plant Stems from Banaras Hindu University Main Campus, India

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ABSTRACT
The present study reports the folk medicinal uses of the stems of plants from Banaras Hindu University main campus, India which spreads over 1,350 acres of land area. Thirteen plant species belonging to 13 genera and 9 families were recorded on the university campus whose stems are therapeutically used against different diseases. Apocynaceae and Fabaceae are the dominant families of the plants on the university campus whose stems are used as folk medicines. Stems of the plants of woody habit are medicinally more useful compared to the stems of the plants of herbaceous habit.

Keywords: Banaras Hindu University, Folk medicines, Folk medicinal plants, Plant stems

INTRODUCTION
Herbal medicines represents probably the first and certainly the oldest system of human health care. Almost all civilizations and cultures have employed plants in treatment of human diseases. According to the World Health Organization 80% of the population of developing countries relies on traditional medicines for their primary health care needs. The rural people of India are still dependent on traditional medicines for their health care and treatment of diseases [1]. Out of more than 8,000 plant species used in India, many of them are used for their medicinal values by the rural people and tribals to cure their diseases [2]. The curative properties of the medicinal plants are due to the presence of various complex chemical substances of different composition present as secondary metabolites in one or more parts of these plants. Several studies have been conducted to explore the folk medicinal uses of plants and their parts in the Uttar Pradesh state of India [3-15].

The great seat of learning Banaras Hindu University was founded by great freedom fighter and social reformer Pandit Madan Mohan Malaviya (1861-1946) in 1916 during the Indian freedom movement as a national university with donations from both rich and the poor. The foundation stone of this largest teaching and residential university of Asia was laid by Lord Hardinge on 4 February 1916, the then Governor General of Colonial India. Presently this vast university has two campuses, 4 institutes, 16 faculties and 140 departments, 4 advanced centers and 4 interdisciplinary centers [16]. The newly established fourth institute of the university named Institute of Environment and Sustainable Development (IESD) has been founded by internationally renowned Ecologist Professor J. S. Singh. About a century old Banaras Hindu University main campus hosts a large variety of plant species [17]. Studies have been conducted to assess the medicinal floristic wealth of the university campus [18, 19]. However, the present study was undertaken with motive to explore the folk medicinal uses of the stems of the plants growing on the Banaras Hindu University main campus by the rural people residing in villages near the university campus.

MATERIAL AND METHODS
Study Site
Banaras Hindu University main campus (Fig. 1) which spreads over 1,350 acres of land area is located about 5 km south of Varanasi city on the western bank of sacred Ganges River (25°18’ N latitude and 83° 1’ E longitude), on levelled topography at an elevation of 76 m [20]. The campus is covered with alluvial deposits of river Ganges. Soil is fertile and sandy loam in texture.

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The climate is Tropical monsoonal type with three distinct seasons; the cold (November to February), the hot (March to mid-June), and the rainy (mid-June to September), while October is regarded strictly as transitional month. The diurnal range of temperature ranges as average between 13º C and 14.5º C in the cold and hot months. The highest monthly temperature is recorded in May, varying between 32º C and 42º C. The annual rainfall is around 100 cm [21].

Methodology

The present study is based on intensive field survey conducted between July 2006 to June 2014 from time to time in different seasons on the Banaras Hindu University main campus for the observations and collections of vascular plant specimens to explore the flora of the university campus. During the field survey it was observed that rural people residing in the villages nearby the university campus like Seer Govardhanpur, Bhagwanpur, Chhitupur, Madarwaa, Sushwahi, Karmanveer, Akhri, Nasirpur, Jangampur, Narayanpur, Nuao, Narottampur, Madhopur, Tadia, Bachchaon, Khanao, Brindavan, Tikari, Kandwa, Avileshpur, Kanchanpur etc. frequently visit the university campus to collect the plant stems for medicinal uses against different ailments. Furthermore, several university employees living in these villages were also observed collecting the stems and stem bark of plants on the university campus for the fulfillment of their medicinal needs. The folk medicinal uses of plant stems is based on interviews with these rural people and the university employees. The traditional
medicinal practitioners and elderly people of villages were also consulted to confirm the folk medicinal uses of plant stems. The plant specimens were identified through various sources [22-24]. Based on the habits the recorded plants were categorized into three types; tree, shrub and herb. The APG III (2009) [25] classification was followed for arranging the taxa to families.

RESULTS AND DISCUSSION

Folk medicinal uses of the stems of plants from Banaras Hindu University main campus is presented in the Table 1. Past studies on the medicinal flora reveals that Banaras Hindu University main campus hosts a large variety of medicinal plants [18, 19]. However, in the present medicobotanical study, 13 plant species belonging to 13 genera and 9 families were recorded on the university campus whose stems are used as folk medicines against diseases like fever, intermittent fever, diarrhoea, dysentery, gonorrhoea, dyspepsia, gastric troubles, heart disorders, asthma, kidney stones, skin diseases and fractured bones. Compared to the present study on folk medicinal uses of stems, Singh (2015a) [1] recorded 14 plant species belonging to 14 genera and 13 families on the Banaras Hindu University main campus whose roots are used as folk medicines against different ailments.

Table 1. Folk medicinal uses of plant stems from Banaras Hindu University main campus

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Plant species</th>
<th>Family</th>
<th>Habit</th>
<th>Local name</th>
<th>Medicinal uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alstonia scholaris R. Br.</td>
<td>Apocynaceae</td>
<td>Tree</td>
<td>Chitwan</td>
<td>Decoction of stem bark is used against fever</td>
</tr>
<tr>
<td>2</td>
<td>Bombax ceiba Linn.</td>
<td>Malvaceae</td>
<td>Tree</td>
<td>Semal</td>
<td>Decoction of stem bark is used in treatment of dysentery</td>
</tr>
<tr>
<td>3</td>
<td>Cissus quadrangularis Linn.</td>
<td>Vitaceae</td>
<td>Herb</td>
<td>Hadzod</td>
<td>Stem paste mixed with turmeric is applied on fractured bones</td>
</tr>
<tr>
<td>4</td>
<td>Dalbergia sissoo Roxb.</td>
<td>Fabaceae</td>
<td>Tree</td>
<td>Shisham</td>
<td>Powdered stem bark is used in treatment of gonorrhoea</td>
</tr>
<tr>
<td>5</td>
<td>Holarrhena pubescens Wall ex G. Don</td>
<td>Apocyanaceae</td>
<td>Tree</td>
<td>Kuraya</td>
<td>Decoction of stem bark is used against fever</td>
</tr>
<tr>
<td>6</td>
<td>Lawsonia inermis Linn.</td>
<td>Lythraceae</td>
<td>Shrub</td>
<td>Mehndi</td>
<td>Crushed stem bark is applied against skin diseases</td>
</tr>
<tr>
<td>7</td>
<td>Nerium oleander Linn.</td>
<td>Apocyanaceae</td>
<td>Shrub</td>
<td>Safed kaner</td>
<td>Decoction of stem bark is used in treatment of intermittent fever</td>
</tr>
<tr>
<td>8</td>
<td>Phanera variegata (Linn.) Benth.</td>
<td>Fabaceae</td>
<td>Tree</td>
<td>Kachnar</td>
<td>Decoction of stem bark is used against diarrhoea</td>
</tr>
<tr>
<td>9</td>
<td>Terminalia arjuna Wt. &amp; Arn.</td>
<td>Fabaceae</td>
<td>Tree</td>
<td>Imli</td>
<td>Stem bark is used in treatment of fever and gastric troubles</td>
</tr>
<tr>
<td>10</td>
<td>Terminalia arjuna Wt. &amp; Arn.</td>
<td>Combretaceae</td>
<td>Tree</td>
<td>Arjun</td>
<td>Powdered stem bark is taken with milk against heart disorders and asthma</td>
</tr>
<tr>
<td>11</td>
<td>Tinospora cordifolia (Willd.) Miers.</td>
<td>Menispermaceae</td>
<td>Shrub</td>
<td>Guruch</td>
<td>Stem decoction is used in treatment of fever and dyspepsia</td>
</tr>
<tr>
<td>12</td>
<td>Tribulus terrestris Linn.</td>
<td>Zygophyllaceae</td>
<td>Herb</td>
<td>Gokhru</td>
<td>Extracts of stem is used against kidney stones</td>
</tr>
<tr>
<td>13</td>
<td>Ziziphus nummularia (Burm. f.) Wt. &amp; Arn.</td>
<td>Rhamnaceae</td>
<td>Shrub</td>
<td>Jharber</td>
<td>Decoction of stem bark is used against dysentery</td>
</tr>
</tbody>
</table>

The maximum number of plants i.e. 3 species were represented each by the Apocynaceae and Fabaceae families. Thus the study indicates that Apocynaceae and Fabaceae are the dominant families of the plants of Banaras Hindu University main campus whose stems are used as folk medicines. Folk medicinal uses of the plant roots from university campus reports the dominance of Fabaceae family [1]. Furthermore, study on wild medicinal flora of the Banaras Hindu University main campus reveals the dominance of Asteraceae, Fabaceae and Acanthaceae families [18] while Asteraceae, Fabaceae and Malvaceae are the dominant families of the entire medicinal floristic wealth of the university campus [19].

Study on habit of the plants reveals that of total recorded species, 7 (53.85%) were represented by the trees, 4 (30.77%) by the shrubs and 2 (15.38%) plant species was represented by the herbs. Therefore, the study suggests that the stems of the plants of woody habit are medicinally more useful than the stems of the plants of herbaceous habit. Contrary to present finding, study on folk medicinal uses of
the plant roots from Banaras Hindu University main campus reports that the plants of herbaceous habit are medicinally more useful than the plants of woody habit [1].

It was observed during the study that Terminalia arjuna was the most exploited medicinal plant on the university campus for its stem bark which is used as a popular folk remedy against cardiac disorders and asthma.

CONCLUSION

It can be concluded from the study that stems of various plant species growing on the Banaras Hindu University main campus are used in traditional system of disease treatment by the rural people residing in villages nearby the university campus. Hence, these folk medicinal plants especially the Terminalia arjuna needs conservation and propagation on the Banaras Hindu University campus for the fulfillment of the medicinal requirements of the present and future generations of rural people residing in vicinity of university campus. This would also be helpful in inheritance of the traditional knowledge of using plant stems against various ailments from one generation to the other generation.

REFERENCES


Arvind Singh “Folk Medicinal Uses of the Plant Stems from Banaras Hindu University Main Campus, India”


AUTHOR’S BIOGRAPHY

Dr. Arvind Singh, is M.Sc. and Ph.D. in Botany with area of specialization in Ecology. He is a dedicated researcher having five dozens of published research papers to his credit in journals of national and international repute. His main area of research is ecological restoration of mine spoils. However, he has also conducted research on the vascular flora of Banaras Hindu University main campus and the vascular wall flora of Varanasi city. Besides main area of research, presently he is also working on the flora of Varanasi and Chandauli districts of the Uttar Pradesh state of India. Furthermore, Dr. Singh is an active science writer having more than ten dozens of published science articles to his credit in different periodicals of national repute.