

Full Length Research Paper

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

Arvind Singh

Department of Botany, Banaras Hindu University, Varanasi- 221 005, India

E-mail: arvindsingh_bhu@hotmail.com; dr.arvindsingh@gmail.com

Accepted 2nd November, 2015

The present study reports the folk medicinal uses of the roots of plants growing on the Banaras Hindu University main campus which spreads over 1,350 acres of land area. A total of 14 plant species of 14 genera belonging to 13 families were recorded on the university campus whose roots are therapeutically used against different ailments by rural population residing in villages nearby university campus. Fabaceae is the dominant family of the plants on the university campus (whose roots are used as folk medicines). Roots of herbaceous plants are medicinally more useful than the roots of shrubs and undershrubs.

Keywords: Banaras Hindu University, Folk medicines, Plant roots

INTRODUCTION

Folk medicine also known as traditional medicine comprises knowledge system that developed over generations within various societies before the era of modern medicine. According to the World Health Organization 80% of the population of developing countries relies on traditional medicines for their primary health care needs. Plants have been the basis of many traditional medicine systems throughout the world for several thousand years and continue to provide mankind with new remedies. According to an estimate about 25,000 formulations in modern allopathic system of medicine are derived from those plants which are being used as folk medicines throughout the world since ages (Pandey and Kumar, 2006). The rural people of India are still dependent on traditional medicines for treatment of various diseases. 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 (Tiwari, 2000). Several studies have been conducted to explore the folk medicinal uses of plants in India (Jain, 1963; Pandey et al., 1981; Singh and Maheshwari, 1983; Dixit and Pandey, 1984; Saxena, 1986; Malkhuri et al., 1998; Dhiman and Khanna, 2001; Khanna, 2002; Singh et al., 2002; Tomar and Singh, 2005 a, b; Pandey and Kumar, 2006; Tomar, 2009; Singh, 2015a).

Banaras Hindu University which is the largest teaching and residential university of Asia 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. Presently this vast university has two campuses, 4 institutes, 16 faculties and 140 departments, 4 advanced centers and 4 interdisciplinary centers (Gautam and Mishra, 2015). 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 protected main campus of Banaras Hindu University hosts a vast variety of plant species (Singh, 2015b). Studies have been conducted to assess the medicinal floristic wealth of the university campus (Singh, 2015c, d). However, the main objective of the present study was to explore the folk medicinal uses of the plant roots growing on the Banaras Hindu University main campus.

STUDY AREA

Banaras Hindu University main campus (Figure 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 river Ganges (25°18' N latitude and 83° 1' E longitude), on levelled topography at an elevation of 76 m (Singh et al., 1971). The campus is covered with alluvial deposits of river Ganges. Soil is fertile and sandy loam in texture.

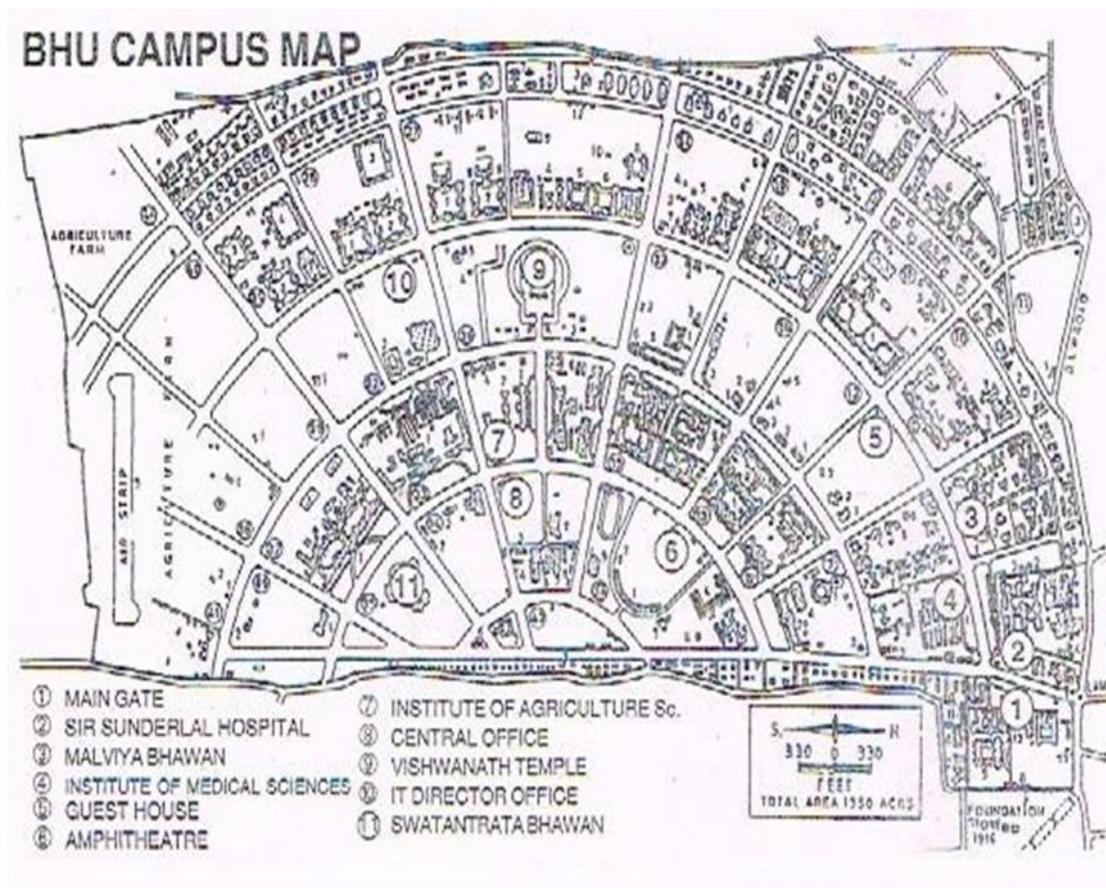


Figure 1: Map of the study area

The climate is Tropical monsoonal type with three distinct season; 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 13° C and 14.5° C in the cold and hot months. The highest monthly temperature is recorded in May, varying between 32° C and 42° C. The annual rainfall is around 100 cm (Singh and Rana, 2006).

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*, *Chhittipur*, *Sushwahi*, *Karmanveer*, *Nasirpur*, *Jangampur*, *Narayanpur*, *Nua*, *Narottampur*,

Madhopur, *Brindavan*, *Tikari*, *Kandwa*, *Kanchanpur*, *Madarwa* etc. frequently visit the university campus to collect the plant roots for the fulfillment of their medicinal needs. The folk medicinal uses of plant roots is based on interviews with these rural people. The traditional medicinal practitioners and elderly people of villages were also consulted to confirm the folk medicinal uses of plant roots. The plant specimens were identified through various sources (Hooker, 1875-1897; Duthie, 1903-1922; Kirtikar and Basu, 1975). Based on the habits the recorded plants were categorized into three types; herb, undershrub and shrub. The APG III (2009) classification was followed for arranging the taxa to families.

RESULTS AND DISCUSSION

Plants of Banaras Hindu University main campus whose roots are used as folk medicines for treatment of different diseases are presented in Table 1. Previous studies on the medicinal flora of the Banaras Hindu University main campus reveals that university campus hosts a large variety of medicinal plants (Singh, 2015c, d). However, in the present medico-ethnobotanical study

Table 1: Plants of the Banaras Hindu University main campus whose roots are used as folk medicines against different ailments by rural people residing in villages nearby the university campus

S. No.	Plant Species	Family	Habit	Local name	Medicinal uses
1.	<i>Asparagus racemosus</i> Willd.	Asparagaceae	Shrub	<i>Satawar</i>	Juice of roots is used against epilepsy. Root powder is taken with milk and sugar against seminal debility
2.	<i>Biophytum sensitivum</i> (Linn.) DC.	Oxalidaceae	Herb	<i>Lajoni</i>	Root decoction is used in treatment of fever
3.	<i>Boerhavia diffusa</i> Linn.	Nyctaginaceae	Herb	<i>Gadahpurna</i>	Crushed or powdered roots are given with honey to cure jaundice
4.	<i>Coccinia grandis</i> (Linn.) Voigt	Cucurbitaceae	Herb	<i>Kunru</i>	Juice of roots is used in treatment of jaundice and diabetes
5.	<i>Desmodium gangeticum</i> (Linn.) DC.	Fabaceae	Under-shrub	<i>Salparni</i>	Root juice is used to cure asthma
6.	<i>Peristrophe bicalyculata</i> (Retz.) Nees	Acanthaceae	Herb	<i>Chitchitia</i>	Root decoction is used against fever
7.	<i>Phyllanthus niruri</i> Linn.	Phyllanthaceae	Herb	<i>Bhui aonla</i>	Decoction of roots is used against jaundice
8.	<i>Rauwolfia serpentina</i> Benth.	Apocyanaceae	Shrub	<i>Sarpagandha</i>	Root decoction is given during labour pain to promote uterine contraction
9.	<i>Sida cordifolia</i> Linn.	Malvaceae	Under-shrub	<i>Bariara</i>	Root bark is used to cure leucorrhoea
10.	<i>Solanum xanthocarpum</i> Schrad. & Wendl.	Solanaceae	Herb	<i>Bhatkatiya</i>	Decoction of roots is given in fever, cough and asthma
11.	<i>Sphaeranthus indicus</i> Linn.	Asteraceae	Herb	<i>Mundi</i>	Root decoction is used in treatment of chest pains and cough
12.	<i>Tephrosia purpurea</i> Linn.	Fabaceae	Herb	<i>Sarpunkha</i>	Juice of root bark is used against stomach pain
13.	<i>Tribulus terrestris</i> Linn.	Zygophyllaceae	Herb	<i>Gokhru</i>	Root extracts are used against kidney stones
14.	<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	Shrub	<i>Ber</i>	Decoction of root bark is given in treatment of diarrhea

14 plant species of 14 genera belonging to 13 families were recorded on the university campus whose roots are used as folk medicines against diseases such as fever, cough, asthma, jaundice, diabetes, diarrhoea, leucorrhoea, epilepsy, chest pains, stomach pains, kidney stones, seminal debility and to ease the child birth. Compared to this study on folk medicinal uses of roots, Singh (2015a) recorded 41 plants of 38 genera belonging to 23 families on the Banaras Hindu University main campus whose leaves are used as folk medicines against different ailments.

The maximum number of plants i.e. 2 species were represented by the Fabaceae family. Thus it is evident from the study that Fabaceae is the dominant family of the plants of Banaras Hindu University main campus whose roots are used as folk medicines. Study on folk medicinal uses of the plant leaves from university campus also reports the dominance of the Fabaceae family (Singh, 2015a). Furthermore, studies on medicinal flora of the Banaras Hindu University main campus also suggests the dominance of the Fabaceae family (Singh, 2015 c, d).

Habit analysis of the plants reveals that of total recorded species, 9 (64.29%) were represented by the herbs, 3 (21.42%) by the shrubs and 2 (14.29%) plant species were represented by the undershrubs. Therefore, the study clearly suggests that the roots of the plants of herbaceous habit are medicinally more useful compared to the roots of shrubs and undershrubs. A study on the folk medicinal uses of the plant leaves growing on the Banaras Hindu University main campus also demonstrates that the leaves of the plants of herbaceous habit are medicinally more useful than the leaves of the plants of other habits (Singh, 2015a).

It was observed during the study that the herb *Boerhaavia diffusa* was the most exploited plant for its root on the Banaras Hindu University main campus which is used as popular remedy against jaundice.

CONCLUSION

It can be concluded from the study that roots of various plant species of Banaras Hindu University main campus are utilized in traditional system of disease treatment by the rural people residing in villages nearby the university campus. Hence, these folk medicinal plants needs to be preserved and propagated on the Banaras Hindu University campus for the fulfillment of the medicinal requirements of the present and future generations. This would also be helpful in inheritance of the traditional knowledge of using plant roots in treatment of diseases from one generation to the other generation.

REFERENCES

APG III (2009). An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III Bot. J. Linn. Soci. 161(2): 105-121.

Dhiman AK Kanna DR (2001). Notes on medicinal flora of Guru Nanak Dev University campus, Amritsar. Environ. Conserv. J. 2(1): 45-57.

Dixit RD Pandey HC (1984). Plants used as folk medicine in Jhansi and Lalitpur sections of Bundelkhand, U. P. Inter. J. Crude Drug Res. 22: 48-51.

Duthie JF (1903-1922). Flora of the Upper Gangetic Plain and of the Adjacent Siwalik and Sub-Himalayan Tracts. 3 Vols. Govt. of India, Central Publication Branch, Calcutta, India.

Gautam VK Mishra R (2015). Scholarly research trend of Banaras Hindu University during 2004-2013: A scientometric study based on Indian citation index. J. Libr. Inform. Tech. 35(2): 75-81.

Hooker JD (1875-1897). Flora of British India. 7 Vols. Reeve and Co., London, U. K.

Jain SK (1963). Studies in Indian Ethnobotany-less known uses of fifty common plants from tribal areas of Madhya Pradesh. Bull. Bot. Surv. India 5: 223-226.

Khanna KK (2002). Unreported ethnomedicinal uses of plants from the tribal and rural folklore of Gonda district, Uttar Pradesh. Ethnobotany 14: 52-56.

Kirtikar KR Basu BD (1975). Indian Medicinal Plants. 4 Vols.

Bishan Singh, Mahendra Pal Singh, Dehra Dun, India.

Malkhuri RK Nautiyal S Rao KS Saxena KG (1998). Role of medicinal plants in traditional healthcare system: A case of study from Nanda Devi Biosphere Reserve. Curr. Sci. 72(2): 152-157.

Pandy G Singh VK Bhatnagar IS (1981). New records to medical efficacy claims of certain plants recorded from Gwalior forest circle, Madhya Pradesh-a preliminary contribution. Bull. Medic. Ethnobot. Res. 2(3): 303-314.

Pandey RS Kumar A (2006). An ethnobotanical study in the Vindhyan region, Uttar Pradesh. Indian J. Forest. 29(4): 389-394.

Saxena HO (1986). Observations on the ethnobotany of Madhya Pradesh. Bull. Bot. Surv. India 28: 149-156.

Singh A (2015a). Folk medicinal uses of the leaves of plants of Banaras Hindu University main campus, India. J. Advan. Biolog. Basic Res. 1(2): 66-68.

Singh A (2015b). Observations on the vascular flora of Banaras Hindu University main campus, India. Inter. J. Mod. Bio. Medi. 6(1): 48-87.

Singh A (2015c). Observations on the wild medicinal flora of Banaras Hindu University main campus, India. Inter. J. Mod. Bio. Medi. 6(1): 1-21.

Singh A (2015d). Medicinal flora on the Banaras Hindu University main campus, India. Inter. J. Bioinform. Biomed. Engineer. 1(3): 222-236.

Singh AK Raghubanshi AS Singh JS (2002). Medical ethnobotany of the tribals of Sonaghati of Sonbhadra district, Uttar Pradesh, India. J. Ethnopharmacol. 81: 31-41.

Singh KK Maheshwari JK (1983). Traditional phytotherapy among tribals of Varanasi district, Uttar Pradesh. J. Econ. Tax. Bot. 4: 829-838.

Singh RL Kayastha SL Singh KN (1971). India: A Regional Geography. The Natural Geographical Society, Varanasi, India pp. 1-45.

Singh RPB Rana PS (2006). The Holy City of Varanasi (NATCON-IASO-WFSOS, Department of Surgical Oncology, Institute of Medical Science, Banaras Hindu University, Varanasi, India pp.49-61.

Tiwari DN (2000). Report of the Task Force on Conservation and Sustainable Use of Medicinal Plants. Bulletin of Planning Commission, Government of India, New Delhi, India.

Tomar A (2009). Folk medicinal uses of plant roots from Meerut district, Uttar Pradesh. Indian J. Traditional Knowledge 8(2): 298-301.

Tomar A Singh H (2005a). Folk medicinal uses of some indigenous plants among the village people of Barnawa in Baghpat district (U. P.). Plant Arch. 5(1): 81-86.

Tomar A Singh H (2005b). Folk medicinal uses of some indigenous plants of Baghpat district of Uttar Pradesh, India. J. Non-Timber Forest Prod. 12(3): 167-170.