



Statistical analysis of Ethnobotanically important flora of Bhandara District (MS), India

Humane Pitambar

Department of Botany, Dharampeth M. P. Deo Memorial Science College, Nagpur, MS, India
Email: aareenpapa_2004@rediffmail.com

Manuscript details:

Received: 07.06.2020
Accepted: 26.08.2020
Published: 30.09.2020

Editor Dr. Arvind Chavhan

Cite this article as:

Humane Pitambar (2020) Statistical analysis of Ethnobotanically important flora of Bhandara District (MS), India. *Int. J. of Life Sciences*, Volume 8(3): 583-588.

Available online on <http://www.ijlsci.in>
ISSN: 2320-964X (Online)
ISSN: 2320-7817 (Print)



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>

ABSTRACT

In the floristic exploration of the Bhandara district, total 906 plants species from angiosperms were collected and or studies from 2005 to 2011. Ethnobotanical studies revealed that 606 plant species i.e., 66.89% plant species belongs to both dicotyledones and monocotyledons are found known for their medicinal properties. On the basis of literature survey 52 taxa are reported for the first time for their new ethnobotanical uses and the remaining 33.11% yet to be discovered for their medicinal properties. This study indicates that the maximum medicinally known taxa are from the dicotyledones i.e., 86.80% as compared to the monocotyledons i.e., 13.20%, out of 606 medicinally known taxa studies in the district.

Keywords: Bhandara District, Angiosperms, Ethnobotany, Medicinal Properties

INTRODUCTION

A *medicinal plant* is any plant used in order to relieve, prevent or cure a disease or to alter physiological and pathological process, (Arias, 1999) or any plant employed as a source of drugs or their precursors. '*Health is dearer than wealth*' as quoted by Hamilton (1997); so, the value of medicinal plants is more than what it is in the marketplace, i.e. it can be said to be essentially infinite. Human beings have been utilizing plants for basic preventive and curative health care since time immemorial (Holley & Cherla, 1998).

According to an all India ethnobiological survey carried out by the Ministry of Environment & Forests, Government of India, there are over 8000 species of plants being used by the people of India. This indicates that the medicinal plants brought in the main stream are from folk medicines. No doubt, more or less each and every plant has medicinal properties that may be known or may not. Hence here all the taxa are considered as the medicinal flora of the district. Among the flora of Bhandara district, 66.89% plant species belonging both dicotyledones and monocotyledones are found known for their medicinal properties. New ethnobotanical uses for 52 taxa are reported for the first time and the remaining 33.11% yet to be discovered for their medicinal properties.

MATERIALS AND METHODS

For the purpose of this study extensive and intensive visits were arranged to various regions of the district in different seasons. The plants were observed in their natural habitat and the phenological data were collected and recorded in the field diary. The multiple specimens of plants in flowering and fruiting stage were collected, preserved and their herbarium sheets were prepared. The field notes were incorporated with the specimens on the herbarium sheets.

The digital photographs of some unique plants were taken with their unique characteristics that can help in identifying the plants in the natural habitat.

Ethnobotanical information was collected from the local people and *Vaidus* practicing in villages. Also the ethnobotanical evidences were searched and recorded from the available literature on ethnobotany.

All the specimens of the taxa have been deposited in the herbarium / museum of Department of Botany, Dharampeth M. P. Deo Memorial Science College, Nagpur (MS), India.

RESULT AND DISCUSSION:

During the floristic exploration of the district over 906 plant species were recorded from the district of which

606 i.e., 90.51% species were found as ethnobotanically important. These species belong to 104 families of dicotyledons and 20 families of monocotyledons of angiosperms. Out of 606 species, 526 species belong to dicotyledons and 80 species to monocotyledons. (Table 1). This indicates that the maximum medicinally known taxa are from the dicotyledones i.e., 86.80% as compared to the monocotyledones i.e., 13.20%, out of 606 medicinally known taxa studies from the district.

The plants in the nature found in the different habitat, and mostly the herbaceous flora is dominant as compared to the shrubs, climbers and trees. Also in present study, it was observed that the herbaceous flora is more favoured in the treatment of various diseases or disorders (Table 2).

The other categories like Shrubs, climbers and trees are equally important in medicinal point of view and shown in Pie Chart: 1.

The family Papilionaceae, Euphorbiaceae, Asteraceae, Malvaceae, Poaceae and Caesalpiniaceae shows most of the known ethnobotanically important medicinal plants. The other families with maximum number of medicinally important plants are Cucurbitaceae, Convolvulaceae, Acanthaceae, Rubiaceae, Lamiaceae, Mimosaceae, Apocynaceae, Verbenaceae, etc. (Table: 3).

Table 1: Statistical analysis of Ethnobotanically important flora of Bhandara district.

Categories	Flora of the District	Percentage	Ethnobotanically Important flora	Percentage
No. of Angspms. Families	137	100%	124	90.51%
No. of Dicot Families	108	78.83%	104	96.30%
No. of Monocot Families	29	21.17%	20	68.97%
Total No. of Genera	547	100%	428	78.24%
No. of Dicot Genera	422	77.15%	361	85.55%
No. of Monocot Genera	125	22.85%	67	53.60%
Total No. of Species	906	100%	606	66.89%
No. of Dicot species	691	76.24%	526	76.12%
No. of Monocot species	215	23.76%	80	37.21%

Table 2: Medicinally known taxa based on habit

Sr. No.	Habit	Known Taxa	Percentage
1	Herbs	283	46.70%
2	Under-shrubs and shrubs	91	15.01%
3	Climbers, Twiners and Lianas	89	14.69%
4	Trees	143	23.60%

The families with ethnobotanically important plants are shown in (Figure 2). In addition to this, 17.22% cultivated or ornamental and 82.78% wild taxa show effective remedies in various ailments.

Medicinal plants are generally use in crude form; this indicates various chemical constituents present work together in removing diseases or disorders. Hence most of the medicinally known plants are found effective against various diseases. Total 22 plants show 21-40 medicinal properties against diseases / disorders each; 177 plants for 11-20 and rest of the plants against 1-10 disease/s or disorder/s. The twenty medicinally known plants are given with their number of medicinal properties in (Table: 4).

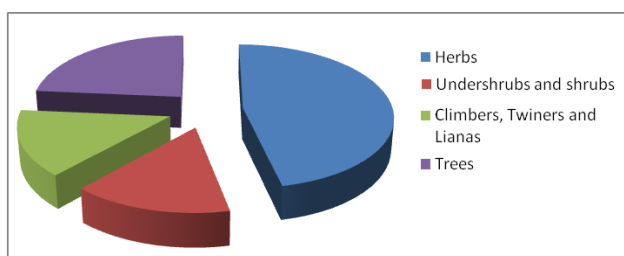


Figure 1: Distribution of the known medicinal plants based on habit

Table: 3: Dominant families with respect to Ethnobotanically important taxa.

Sr. No.	Name of Family	Known Medicinal Taxa
1	Papilionaceae	57
2	Euphorbiaceae	32
3	Asteraceae	26
4	Malvaceae	24
5	Poaceae	23
6	Caesalpinaceae	19
7	Cucurbitaceae	16
8	Convolvulaceae	16
9	Acanthaceae	16
10	Lamiaceae	16
12	Rubiaceae	15
13	Mimosaceae	12
14	Apocynaceae	12
15	Verbenaceae	12
16	Moraceae	11
17	Rutaceae	10
18	Brassicaceae	09
19	Amaranthaceae	09
20	Liliaceae	09

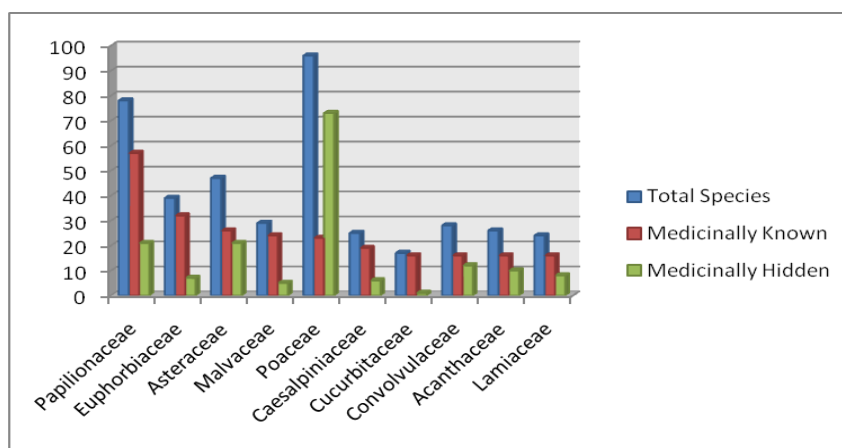


Figure 2: Distribution of the taxa based on their families (Medicinally hidden= unknown medicinal properties).

On the basis of therapeutic value, maximum number of plants are used as Anti-diarrhoeal, Anti-dysenteric, Anti-inflammatory, Anti-diuretic, Vulnerary etc. are given in (Table: 5). In addition to this, more than 25 plants used as Expectorant, Antibacterial, Emollient and Sedative. The other therapeutic properties are Abortifacient, Demulcent, Aphrodisiac, Antipyretic, Emetic, Diaphoretic, Galactagogue, hepatic,

hypertensive Antiseptic, emmenagogue shown by more than 10 plants each.

In present studies, aerial parts of the plants are most favoured in the treatment. In case of the herbaceous flora, whole plants are useful in the treatment. But in other cases most frequently useful plant part is leaf followed by roots, fruits, barks, seeds, flowers, and others as latex and gums etc. (Table 6).

Table 4: Plant species which claim number of medicinal properties.

Sr. No.	Name of the Species	Medicinal properties
1	<i>Butea monosperma</i>	37
2	<i>Butea superba</i>	34
3	<i>Tribulus terrestris</i>	31
4	<i>Argyrea nervosa</i>	29
5	<i>Phyllanthus emblica</i>	29
6	<i>Azadirachta indica</i>	28
7	<i>Moringa oleifera</i>	27
8	<i>Pongamia pinnata</i>	27
9	<i>Vitis vinifera</i>	26
10	<i>Boswellia serrata</i>	25
11	<i>Hibiscus rosa-sinensis</i>	25
12	<i>Clitoria ternatea</i>	24
13	<i>Cassia occidentalis</i>	24
14	<i>Solanum nigrum</i>	24
15	<i>Hemidesmus indicus</i>	23
16	<i>Bacopa monnieri</i>	23
17	<i>Clerodendrum serratum</i>	22
18	<i>Gloriosa superba</i>	22
19	<i>Tephrosia purpurea</i>	21
20	<i>Cassia fistula</i>	21

Table 5: Distribution of the taxa based on Therapeutic value.

Sr. No.	Therapeutic property	No. of plants
1	Antidiarrhoeal	132
2	Antidysenteric	115
3	Anti-inflammatory	103
4	Antidiuretic	95
5	Vulnerary	90
6	Gastrointestinal	84
7	Antiasthmatic	70
8	Tonic	61
9	Flatulent	52
10	Resolvent	47
11	Antidiabetic	44
12	Astringent	44
13	Antiemetic	35
14	Laxative	30
15	Febrifuge	28
16	Discutient	28
17	Carminative	27
18	Anthelmintic	26
19	Vermifuge	25
20	Catarrhal	25

Table 6: Distribution of the taxa based on part used.

Sr. No.	Part used	No. of plants
1	Whole plant	209
2	Roots or root tubers	205
3	Stems or rhizomes	46
4	Barks	114
5	Leaves	226
6	Flowers	68
7	Fruits	115
8	Seeds	109
9	Others (gums, latex etc.)	10

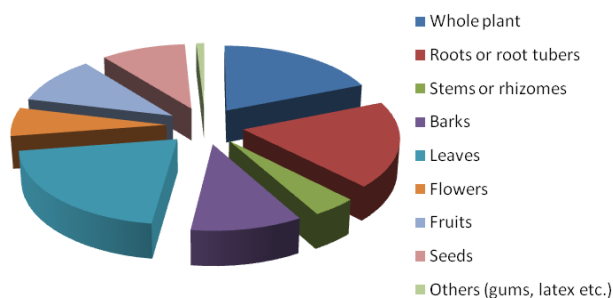


Figure 3: No. of Taxa based on part used

Table 7: Distribution of the taxa based on diseases/disorders.

Sr. No.	Disease / Disorder	No. of Plants
1	Fever	184
2	Cutaneous	135
3	Diarrhea	132
4	Coughs / whooping cough	131
5	Ulcer	124
6	Dysentery	115
7	Bronchitis	97
8	Leprosy	90
9	Asthma	70
10	Burning sensation	61
11	Strangury	60
12	Urinary	50
13	Cardiac	49
14	Anorexia	46
15	Colic	45
16	Biliousness	42
17	Constipation	42
18	Teeth & gums	41
19	Jaundice	33

Table 8: Distribution of the taxa based on body parts against used.

Sr. No.	Body Parts	No. of Plants
1	Skin	135
2	Stomach	76
3	Nerves	60
4	Liver	55
5	Eye	53
6	Heart	49
7	Blood	40
8	Breast	30
9	Muscles	27
10	Brain	26
11	Nose	25
12	Head	23
13	Throat	22
14	Teeth & Gums	21
15	Ear	21
16	Kidney	19
17	Uterus	18
18	Back	17
19	Hairs	15
20	Urethra	14

The distribution of the plants based on part used in treatment of various diseases/disorders are given in Figure 3

Medicinal plants studied during the research work are useful against 159 Diseases. Most of the plants are useful against Fever, Skin diseases, Diarrhoea, Cough, Ulcers and Dysentery (Table 7). The other important diseases / disorders are Conjunctivitis, Tumours, Epilepsy, Anaemia, Miscarriages, Leucorrhoea, Syphilis, Renal disorders, Cephalgia, Hyperdipsia, Malaria, Hysteria, Urticaria, Tuberculosis, Arthritis, Cholera, Erysipelas, Eczema, Impedigo, Epitaxis etc.

In addition to these some plants are also useful in bite or stings of different animals or insects, for example *Alangium salvifolium* (L. f.) Wangerin is useful in bites of rabid dog; *Calycopteris floribunda* (Roxb.) Poir., *Ludwigia adscendens* (L.) Hara, *Diplocyclos palmatus* (L.) C. Jeffrey etc. in snake bite; *Ficus carica* L. in insect bites/stings, and *Abelmoschus ficulneus* (L.) Wight & Arn. ex Wight, *Cassia occidentalis* L., *Momordica dioica* Roxb. ex Willd. etc. in scorpion stings.

Medicinal plants based on the body parts ailments are given in Table 8. These plants claim for 40 body parts ailments, of which skin is the most favoured body part. Some of the other taxa also claims for the treatment of body parts like Urethra, Joints, Bladder, Face, Bones, Intestine, Chest, Testes, Vagina, Vocal Cord or Larynx, Stomach, Intestine, Anus, Lymph Glands, Mouth, Tonsils, Urinary Bladder etc. and one taxa each used in ailments of Penis, Clitoris, Hip, Umbilical Cord and Ureter.

CONCLUSION

Of the total flora of the Bhandara district, 606 plant species belongs to 124 families (104 families of Dicotyledons and 20 families of Monocotyledons) of angiosperms were found known for 159 ailments. The many plants were found useful in treatment of more than 20 ailments each. Some of the plants were also found to possess curative properties in serious diseases/disorders like, cancer, Snake bite, Migraine, Scorpion stings, Fits, Rabies, etc.

Conflict of Interest

The author declares that there is no conflict of interest.

REFERENCES

- Alagesaboopathi C and Rajendran K (2009) Ethnomedicinal plants of Sirumalai hills of Dindigul District, Tamilnadu, India. *Ethnobotanical leaflets*. 13: 159-164.
- Arias TD (1999) *Glossary of Drug Development, evaluación y uso*. Pan American Health Organization. WHO Washington D. C.
- Balick MJ and Cox PA (1997) *Plants, People and Culture: the Science of Ethnobotany*, Scientific American Library, New York, NY.
- Chaturvedi Alka and Gadpayale VJ (2007) Some less known ethno-medicinal plants used by tribes of Bhandara District. In Proc. National conference on emerging trends in medicinal plants and their bio-technical advances. P.3-7.
- Cooke T (1958) *The Flora of the Presidency of Bombay*. Vol. I-III, (BSI reprint), Calcutta.
- Cragg GM and Newman DJ (2005) Biodiversity: A continuing source of novel drugs leads, *Pure Appl. Chem.* 77 (1): 7-24.
- Davis PH and Heywood VH (1963) *Principles of Angiosperms Taxonomy*, Oliver & Boyd, Edinburgh and London.
- Haines HH (1916) *Descriptive list of Trees, shrubs and Economic herbs of Southern Circle, Central Provinces*, Allahabad.
- Hamilton AC (1997) *Threats to plants: an analysis of Centres of Plant Diversity*. In: Touchell, D.H. and Dixon, K.W. (eds), Conservation into the 21st Century, vol. Proc. 4th International Botanic Gardens Conservation Congress, pp. 309-322. Kings Park and Botanic Garden, Perth.
- Holley J, Cherla K (1998) *The medicinal plants sector in India*. The International Development Research Center, South Asia Regional Office, Medicinal and Aromatic Plants Programme in Asia, Delhi.
- Husain SZ, Malik RN, Javed M and Bibi S (2008) Ethnobotanical properties and uses of medicinal plants of Morgah biodiversity park, Rawalpindi. *Pakistan J. of Botany*. 40(5): 1897-1911.
- Jain SK (1991) *Dictionary of Indian Folk Medicine and Ethnobotany*. Deep Publications, New Delhi.
- Jain SK and Rao RR (1983) *Ethnobotany in India: An overview*. Botanical Survey of India, Howrah.
- Malhotra SK and Madhusudan Rao K (1981c) A contribution to the flora of Bhandara district, Maharashtra state (India). *J. Econ. Tax. Bot.* 2: 107-136.
- Naik VN (1998) *Flora of Marathwada*. Amrut Prakashan, Aurangabad.
- Pandit BR and Oza RA (1986) Some ethnobotanical claims from Bhavnagar district. *Proc. Nat. Acad. Sci.* 56th Annual session report. 194.
- Pathak AS (2003) Central Provinces, District Gazetteers-Bhandara District, (ed.). The Govt. Central Press, Mumbai.

Sharma BD, Karthikeyan S & Singh NP (Edited by) (1996) *Flora of Maharashtra State (Monocotyledones)*, (BSI print), Calcutta.

Singh NP & Karthikeyan (eds.) (2000) *Flora of Maharashtra State (Dicotyledones)*, Vol-I, (BSI print), Calcutta.

Singh NP, Lakshinarasimhan P & Karthikeyan S (2000) *Flora of Maharashtra State (Dicotyledones)*, (eds.), Vol.- II, (BSI print), Calcutta.

Ugemuge NR (1986) *Flora of Nagpur District*. Shree Prakashan, Nagpur.

© 2020 | Published by IJLSCI