

Ethnomedicinal uses of plants by traditional healers in Ajaygarh, district Panna (MP) India

*Manoj Kumar and Mayank Singh

Department of Botany,
Chhatrasal Govt. PG College,
PANNA (MP) INDIA

*Corresponding Author

E-mail: manojshuklacktd@gmail.com

Received : 13.03.2023; **Accepted** : 10.05.2023

ABSTRACT

Medicinal plants are important in traditional healthcare practices, providing clues to new areas of research for human welfare. This study was an effort to document the indigenous knowledge of traditional healers about traditional uses of medicinal plants for curing different human diseases. Janpad panchayat Ajaygarh, a tehsil of district Panna of Madhya Pradesh state is rich in diversity of medicinal plants. Data of traditional uses of medicinal plants have been collected from December 2021 to November 2022 by survey and interviews method with local villagers and Vaidya. Structured questionnaires, interviews and participatory observation were used to collect data of ethnomedicinal uses of plants in study area. 20 sampling villages of Janpad panchayat Ajaygarh were selected for study purpose and 60 informants including 40 men and 20 women, 3 from each sampling stations were selected and interviewed during the one year journey of data collection. 55 medicinal plant species belonging to 53 genera of 33 families were identified. It shows that there is high potential available in the form of diversity of medicinal plants for treatment purpose of human beings in any system of medicine like as Folk medicine, Ayurveda, Homeopathy, Unani, Siddha, Allopathy and others.

Figure : 01

References : 28

Table : 01

KEY WORDS : Ajaygarh, Biodiversity, Ethnomedicinal plants, Panna district, Traditional healers.

Introduction

The medicinal plants have been focused since ancient time for saving human life. The ancient Indian wisdom of medicine known as Ayurveda has come from Atharva Veda¹. Folk medicines, mainly based on plants are safe, effective and inexpensive. Indigenous remedies are gaining popularity today among the people. Information from indigenous traditional medicine has played a vital role in the discovery of novel chemotherapeutic products from plants. The people of the local villages and tribal areas are the repository of accumulated experience and knowledge about traditional uses of medicinal plants for various human ailments, which reaches them from generation to generation^{5,9,10,14,19}. More than 43% of the total flowering plants are from India reported to be of medicinal importance¹⁵. Medicinal plant's importance in traditional healthcare practices, providing clues to new areas of research and biodiversity conservation, is now well recognized^{7,20}. This study was an effort to document the indigenous knowledge of traditional healers and local people about traditional uses of medicinal plants for curing different ailments. Though some workers^{3,6,8,17,18}

documented ethnomedicinally important plants of the area, still a lot of work is required to be done. In the present paper, folk medicinal preparations of 55 plant species used for different ailments has been represented. Objectives of present research work were: to explore the knowledge of traditional healers and local people on ethnomedicinal uses of plants in selected villages of Janpad panchayat Ajaygarh to enlist the indigenous medicinal plants used by traditional healers and local people for common ailments and to create awareness among the local community about the protection of native medicinal plants.

Material and Methods

Janpad panchayat Ajaygarh is a tehsil of district Panna in Madhya Pradesh.

It falls under the latitude 24.90409 and the longitude 80.259899 with an average elevation of 215.99 meters (708.63 feet), climate is subtropical and vegetation type is deciduous. Data of traditional uses of medicinal plants have been collected from December 2021 to November 2022 by the survey and interviews method with local villagers and Vaidya/Hakim. From selected 20 Village panchayats named as *Vishramganj*,

Pratappur, Singhpur, Ajaygarh, Hardi, Siddhpur, Nayagaon, Dharampur, Deogaon, Pishta, Biharasarvariya, Banaharikala, Sabdua, Bariyarpurbhumiyana, Gumanganj, Bilahai, Laulas, Beera, Sinhai and Barakagareka. Total 60 informants including 40 men and 20 women, 3 from each sampling stations were selected and interviewed during survey period. Structured questionnaires, interviews and participatory observations were used to collect data. Frequent field trips were arranged for this purpose. The identification of the plants was done with the help of various 'Floras', such as 'The Flora of British India' ⁴, Flora of Madhya Pradesh ^{12,18} and other pertinent literature ^{5,9,10,12,16-28}.

Result and Discussion

In the present work 55 medicinal plant species belonging to 53 genera of 33 families were collected and identified during all seasons of one year of study. 43 plant species have been reported from remote villages of Panna district (M. P.), India ¹⁴. Information regarding Botanical name, local name, family and part used for medicinal purpose are listed in Table-1 and selected field photographs of identified medicinal plants shows in Fig. 1. Aak, *Calotropis procera* (Asclepiadaceae) is a perennial shrub, grows in wasteland and roadsides etc. Leaves used as antidote for snake bite, rheumatism, and body pain. Young fruits boiled in water and a paste prepared to remove blood clots. Adusa, *Adhatodavasica* (Acanthaceae) is a perennial shrub, grows in waste land, roadsides. Leaves, root & flower medically used in cough, cold, allergy etc. Amaltash, *Cassia fistula* (Caesalpiniaceae) is a moderate sized evergreen widespread forest tree. Bark, Leaf, Fruit and Root are used in the treatment of constipation, convulsions, diarrhoea, dysuria, epilepsy, hematuria, pimples, and glandular tumors. The pulp of the ripe pod is a powerful purgative and also used to cure mouth ulcers. Amla, *Emblia officinalis* (Euphorbiaceae) is a deciduous tree, grows in dry and moist deciduous forest, also cultivated in plains. Dried fresh fruits are used in several ayurvedic medicines like "Trifala (three fruits i.e., amla, bahera and harra) Churn". It improves overall digestion process, also used in traditional hair and skin care formulations. Arjun, *Terminalia arjuna* (Combretaceae) is a large deciduous tree, found mostly along the river banks from plains to 1000 m height. Bark used in curing of heart diseases, diabetes, high BP etc. Ashwgandha, *Withania somnifera* (Solanaceae) is a perennial shrub, wild and cultivated. Roots, stem, bark, leaves and flowers are traditionally used to cure heart problems, fever, liver disorders, respiratory infections, pain, wounds, ulcers and sex-related diseases. Bada Dudhi, *Ephorbia hirta*

(Euphorbiaceae) is an annual herb grows as a weed of cultivated & wastelands, used in traditional medicine for asthma, skin ailments, female disorders and hypertension. It is also consumed in herbal tea to cure fever. Bahera, *Terminalia bellirica* (Combretaceae) is a large deciduous tree, found in moist deciduous forests & plains. Fruit pulp is used as constituent in Ayurvedic medicine "Triphala Churn", relieve from constipation and gastric problems thus improves overall digestion process. Bel, *Aegle marmelos* (Rutaceae) is a deciduous tree, growing in hills and plain areas. Ripe fruit laxative, used in indigestion and constipation problems. Bhrangraj, *Eclipta prostrata* (Asteraceae) is an annual / perennial herb, grows commonly in moist places in tropical areas, used in traditional medicines, especially for wound healing, oil obtained from leaf used as hair tonic also. Chiriheta, *Cocculus hirsutus* (Menispermaceae) is a perennial climber grows in deciduous forest. Whole plant is used for the treatment of stomach disorders, fever, skin diseases and urinary problems. Chhotadudhi, *Ephorbia prostrata* (Euphorbiaceae) is an annual herb grows as a weed of cultivated land, wastelands & roadside. Leave extract is effective for treatment of bleeding. Chirchira, *Achyranthus aspera* (Amaranthaceae) is a perennial herb, grows in waste lands, road sides. Roots served as a tooth stick to clean the teeth, leaves, stem and root have medicinal value. Chitrak/Chitavar, *Plumbago zeylanica* (Plumbaginaceae) is a herb grows in moist deciduous forest, cultivated also. Leaves, root and root bark used in preparation of various Ayurvedic medicines for treatment of intestinal trouble, dysentery, leukoderma, inflammation, piles and bronchitis etc. Dahiman, *Cordia macleodii* (Boraginaceae) is a perennial tree of deciduous forest. Leaf and bark used ethnomedicinally for various purposes like healing wounds, mouth sores, and curing jaundice. Datura, *Datura metel* & *D. stramonium* (Solanaceae) is a herb / sub shrub of deciduous forest and wastelands. Leaves and seeds medically useful in treatment of inflammation, wounds, rheumatism and gout, sciatica, cough, fever, and asthma. Dudhi, *Wrightia tinctoria* (Apocynaceae) is a wild, perennial, deciduous shrub, grows in moist and dry deciduous forest. Leaf and bark of plant used for traditional medicine to cure toothache, headache, diarrhoea, jaundice, piles, ringworm and other skin diseases; oil obtained by soaking leaves in coconut oil is used for treating psoriasis. Gambhari/Khamhera, *Gmelina arborea* (Verbenaceae) is a moderately deciduous tree grows in open forests. Root is an ingredient of the "Dasamula", promotes digestive power also useful in fever, dyspepsia, heart diseases, nervous disorders, piles etc. Ganja, *Cannabis sativa*

TABLE -1 : List of identified medicinal plants from study area.

Sr. No.	Local Name	Scientific Name	Family	Parts used in medicine
1	Aak/madar	<i>Calotropis procera, C. gigantia</i>	Asclepiadaceae	Leaves, root, bark and fruit
2	Adusa	<i>Adhatoda vasica</i>	Acanthaceae	Leaves, root & flower
3	Amaltas	<i>Cassia fistula</i>	Caesalpiniaceae	Leaves, bark, root & fruit
4	Amla	<i>Emblica officinalis</i>	Euphorbiaceae	Fresh & dried fruits
5	Arjun	<i>Terminalia arjuna</i>	Combretaceae	Bark
6	Ashwgandha	<i>Withania somnifera</i>	Solanaceae	Leaves, bark, root & flowers
7	Bada Dudhi	<i>Ephorbia hirta</i>	Euphorbiaceae	Leaves
8	Bahera	<i>Terminalia bellirica</i>	Combretaceae	Fruits
9	Bel	<i>Aegle marmelos</i>	Rutaceae	Fruits
10	Bhranraj	<i>Eclipta prostrata</i>	Asteraceae	Leaves & whole plant
11	Chhirheta	<i>Cocculus hirsutus</i>	Menispermaceae	Leaves & whole plant
12	Chhota dudhi	<i>Ephorbia prostrata</i>	Euphorbiaceae	Leaves
13	Chirchira	<i>Achyranthus aspera</i>	Amaranthaceae	Stem & leaves
14	Chitrak/Chitavar	<i>Plumbago zeylanica</i>	Plumbaginaceae	Leaves & whole plant
15	Dahiman/Dahipalas	<i>Cordia macleodii</i>	Boraginaceae	Leaves & bark
16	Datura	<i>Datura metel, D. stramonium</i>	Solanaceae	Leaves, flower and seeds
17	Dudhi	<i>Wrightia tinctoria</i>	Apocynaceae	Leaves, bark, root and seeds
18	Gambhari/Khamhera	<i>Gmelina arborea</i>	Verbenaceae	Root
19	Ganja	<i>Cannabis sativa</i>	Cannabaceae	Leaves & inflorescence
20	Ghamra	<i>Tridax procumbens</i>	Asteraceae	Leaves & whole plant
21	Ghav bel	<i>Argyreia nervosa</i>	Convolvulaceae	Leaves & root
22	Ghritkunvari/gvarpatha	<i>Aloe vera</i>	Liliaceae	Leaves

23	Ghont	<i>Zizyphus xylopyrus</i>	Rhamnaceae	Fruit & bark
24	Goodsakari	<i>Grewia hirsuta</i>	Malvaceae	Leaves & whole plant
25	Gorakhmundi	<i>Sphaeranthus indicus</i>	Asteraceae	Whole plant
26	Gudmar	<i>Gymnema sylvestre</i>	Apocynaceae	Leaves
27	Gurch, Giloy	<i>Tinospora cordifolia</i>	Menispermaceae	Stem & leaves
28	Hadjod	<i>Cissus quadrangularis</i>	Vitaceae	Stem & root
29	Harra	<i>Terminalia chebula</i>	Combretaceae	Fruit
30	Harsingar/Seharua	<i>Nyctanthes arbotristis</i>	Oleaceae	Leaves
31	Hurhur	<i>Cleome viscosa</i>	Cleomaceae	Whole plant
32	Jangalipyaj	<i>Urgenia indica</i>	Liliaceae	Leaves & bulb
33	Kali Musli	<i>Curculigo orchioides</i>	Hypoxidaceae	Root tuber
34	Kalmegh/Chirayta	<i>Andrographis paniculata</i>	Acanthaceae	Leaves & whole plant
35	Kanghi	<i>Abutilon indicum</i>	Malvaceae	Leaves & root
36	Kateri	<i>Solanum xanthocarpum</i>	Solanaceae	Fruit
37	Makoy	<i>Solanum nigrum</i>	Solanaceae	Leaves & fruit
38	Marodfali/Enthi	<i>Helicte resisora</i>	Sterculiaceae	Bark & fruit
39	Motha	<i>Cyperus rotundus</i>	Cyperaceae	Rhizome
40	Mrigsinghi	<i>Pistacia integerrima</i>	Anacardiaceae	Leaf galls
41	Neem	<i>Azadirachta indica</i>	Meliaceae	Leaves, fruit & bark
42	Nirgundi	<i>Vitex negundo</i>	Verbenaceae	Leaves, root and seeds
43	Pattharchatta	<i>Bryophyllum pinnatum syn. Kalanchoe pinnata</i>	Crassulaceae	Leaves
44	Pudina	<i>Mentha arvensis</i>	Lamiaceae	Leaves & whole plant
45	Punarnava	<i>Boerhavia diffusa</i>	Nyctaginaceae	Leaves & whole plant
46	Putrinjiva	<i>Putranjiva roxburghii</i>	Putranjivaceae	Leaves

47	Ring worm bush	<i>Cassia alata syn. Senna alata</i>	Caesalpinaceae	Leaves
48	Safed Musli	<i>Chlorophytum borivilianum</i>	Asparagaceae	Root tuber
49	Sahdevi	<i>Vernonia cinerea</i>	Asteraceae	Whole plant
50	Satavar	<i>Asparagus racemosus</i>	Asparagaceae	Root
51	Shankhpushpi	<i>Convolvulus prostratus</i>	Convolvulaceae	Whole plant
52	Tulsi	<i>Ocimum sanctum</i>	Lamiaceae	Leaves & Whole plant
53	Vidarikand	<i>Pueraria tuberosa</i>	Fabaceae	Tuber

(*Cannabaceae*) is an annual herb, cultivated and also in wild. Flowering top, leaves, tender shoots have medicinal importance, leaf used for treatment of skin disorders and circulatory system disorders; seed used for curing musculoskeletal system disorders and traumas; while inflorescence is used in treatment of nervous system and mental disorders. Ghamra, *Tridax procumbens* (Asteraceae) is a perennial herb grows in deciduous forest, fields and waste land, Whole plant is used in wound healing, oil for healthy hairs. Ghavbel, *Argyrea nervosa* (Convolvulaceae) is a perennial climbing shrub, grown as medicinal plant. Leave extracts is used in the treatment of eczema, ringworm, itch and related skin diseases, leaves poultice applied in chronic ulcers, root parts are used to cure gonorrhoea, chronic ulcers, rheumatism and diseases of the nervous system. Ghritkunvari/gvarpatha, *Aloe vera* (Liliaceae) is a perennial succulent plant, cultivated & also grows as ornamental. Leaf gel is *anti-inflammatory* used to *heal wounds and treat skin problems*. Ghont, *Zizyphus xylopyrus* (Rhamnaceae) is a shrub to small armed tree found in scrub and deciduous forests. Bark used to prepare medicines for gastric problem. Goodsakari, *Grewia hirsuta* (Malvaceae) is a under shrub grows in moist and dry deciduous forest, also in grassland. Leaf extract used for to treat dysentery and diarrhoea. Gorakhmundi, *Sphaeranthus indicus* (Asteraceae) is an annual herb found growing in paddy fields & wet areas. Juice of plant is useful in liver and gastric disorder. Gudmar, *Gymnema sylvestre* (Apocynaceae) is a large climbing shrub grows in deciduous or scrub forest. Leaves are used to neutralize sugar test. Gurch/Giloy, *Tinospora cordifolia* (Menispermaceae) is a climbing shrub, grows in tropical forest. Leaves and stem medicinally used for curing malarial and chronic fever, typhoid, dysentery, chronic diarrhea, jaundice, cancer, bone fracture, pain, asthma and skin disease. Hadjod,

Cissus quadrangularis (Vitaceae) is a succulent climber, found in open forest and cultivated also. Stem and root is used in treatment of bone fracture rheumatoid arthritis, osteoarthritis and osteoporosis. Harra, *Terminalia chebula* (Combretaceae) is a medium to large deciduous tree, found in deciduous forests and plains. Fruit is used as constituents in Ayurvedic medicine 'Triphala', also useful in constipation and diabetes. Harsingar/Seharua, *Nyctanthes arbotristis* (Oleaceae) is a deciduous shrub or small tree, grows in dry deciduous forests, also cultivated in plains. Leaves used in Ayurvedic medicine and Homeopathy for sciatica and arthritis. Hurhur, *Cleome viscosa* (Cleomaceae) is an annual/perennial herb, grows in waste lands and roadsides. Various extracts of plant are used in treatment of mental disorders, convulsions, liver diseases, arthritis and fractures.

Jangalipyaj, *Urgenia indica* (Liliaceae) is an annual herb found in forest edge. Plant bulb used in treating rheumatism, dropsy, edema, gout, asthma, erectile disinfection. Kali Musli, *Curculigo orchoides* (Hypoxidaceae) is a shade loving herb plant, grows in moist deciduous forest, cultivated also. Root tuber is used for many medicinal purposes such as impotency, aphrodisiac, tonic, jaundice, cough, asthma, piles and skin ailments. Kalmegh/Chirayta, *Andrographis paniculata* (Acanthaceae) is an annual herb, found in forest edge, cultivated also. Whole plant traditionally used for the treatment of cold, fever, laryngitis and several infectious diseases ranging from malaria to dysentery and diarrhoea¹⁰. Kanghi, *Abutilon indicum* (Malvaceae) is a perennial, shrub, grows in degraded forest and wastelands. Root and leaves used in fever and curing piles. Kateri, *Solanum xanthocarpum* (Solanaceae) is a perennial sub-shrub, found in degraded forest and wastelands. Fruit and root are medicinally used. Makoy, *Solanum nigrum* (Solanaceae) is an annual herb, grows



Fig. 1 : Selected field photographs of identified medicinal plants

wild, found in moist places. Leaves juice is used in stomach ache. Marodfali/enthi, *Helicte resisora* (Sterculiaceae) is an annual/perennial herb, found in forest edge. Bark, fruits, leaves and seeds of the plant are used in the traditional system of medicine to cure gastrointestinal disorders like stomachache, diarrhea¹². Maruadona, *Ocimum gratissimum* (Lamiaceae) is an annual/perennial herb, wild, grows in wasteland. Leaves have medicinal value. Motha, *Cyperus rotundus* (Cyperaceae) is an annual/perennial grass up to 40 cm, found in moist oil near water bodies. The rhizomes used as traditional folk medicines for the treatment of stomach, bowel disorders, inflammatory diseases and menstrual disorders. Mringsinghi, *Pistacia integerrima* (Anacardiaceae) is a tree of average size, found in moist and deciduous forest. The leaf galls are used for cough, asthma, diarrhoea, fever and vomiting etc. Neem, *Azadirachta indica* (Meliaceae) is a medium to large size deciduous tree, grown in tropical and subtropical regions. Leaves, bark and fruit have medicinal values, used in several traditional medicine. 'Neem oil' extract from seeds is used in preparation of soap and ointment etc. Nirgundi, *Vitex negundo* (Verbenaceae) is a perennial shrub, grows in wasteland, degraded forest and fallow fields. Root, leaves and seeds are used to treat joint pain, swelling, asthma, cough, wound, fever and ulcer etc. Pattharchatta, *Bryophyllum pinnatum* syn. *Kalanchoe pinnata* (Crassulaceae) is a succulent herb. Leaves used in kidney stone. Pudina, *Mentha arvensis* (Lamiaceae) is a perennial, herb grows in marshes or cultivated. Leaves used in food, drinks and medicines. Punarnava, *Boerhavia diffusa* (Nyctaginaceae) is a perennial herb, grows in waste land and river bank. Roots are used as laxative, diuretic, expectorant, leaves used as an appetizer and alexiteric preparation, seeds used as energizer and also help in digestion. Plant also used to cure night blindness and helps to bring back virility in men². Putranjiva, *Putranjiva roxburghii* (Putranjivaceae) is a moderate sized evergreen tree with pendent branches, found in moist deciduous forests. Leaves and fruits used as medicine for rheumatism. Ringworm bush, *Cassia alata* syn. *Senna alata* (Caesalpinaceae) is a shrub, found in diverse habitats like roadsides, river banks etc. Plants have medicinal value due to its laxative, purgative and anti-fungal properties. Safed Musli, *Chlorophytum borivillianum* (Asparagaceae) is a herb, grows in moist deciduous forest, cultivated also. Tubers have very good Ayurvedic medicinal properties

used for increasing sexual desire, erectile dysfunction, athletic performance, osteoarthritis and gonorrhoea etc. Sahdevi, *Vernonia cinerea* (Asteraceae) is an annual herb, found in forest edge, weed of field and road sides etc. Whole plant is useful in piles, intestinal worms, blood disorders, wound healing, against chronic skin disorders, stomachache, liver ailments and fever etc. Satavar, *Asparagus racemosus* (Asparagaceae) is an annual, highly spinous and branched climber, found in all types of forest and plains. Tuberos roots are used in medicine improving the general state of health and for stress-related immune disorders. Shankhpushpi, *Convolvulus prostratus* (Convolvulaceae) is a creeping/climbing herb, weed of field and road sides etc. Whole plant is used medicinally in the form of decoction with cumin and milk in fever, loss of memory and nervous debility. *C. pluricaulis* used as brain tonic. Tulsi, *Ocimum sanctum* (Lamiaceae) is a perennial herb, cultivated, also grows as wild. Leaves used in decoction, tea and medicines. Whole plant specially leaves used in treatment of bronchitis, diarrhea, dysentery, skin diseases and malaria. Vidarikand, *Pueraria tuberosa* (Fabaceae) is a perennial herb, found in moist and deciduous forest and hilly region. Tuber used for treatment of fever, menorrhagia, skin disease, wounds, asthma and jaundice.

Conclusion and Recommendation

The study reveals that the traditional healers of the local villages and tribal areas are the repository of knowledge and experience about traditional uses of medicinal plants for various human ailments, which reaches to them from generation to generation. The documentation of this knowledge has provided novel information about ethnomedicinal uses of plants from the study area which will help in create awareness among the local communities about the conservation of native medicinal plants and providing pharmacological leads for the welfare of human beings. Identification of 53 medicinal plant species belonging to 53 genera of 33 families from the study area disclose that there is high potential available in the form of diversity of medicinal plants for treatment purpose of human beings in any system of medicine like as Folk medicine, Ayurveda, Homeopathy, Unani, Siddha, Allopathy and others. It is recommended that there is a requirement of proper utilization of medicinal properties of these native plants for human betterment without causing any challenges of their sustainability.

References

1. Dey AC. *Indian Medicinal Plants Used in Ayurvedic Preparations*. Bishen Singh and Mahendra Pal Singh, Dehradun, 1980.

2. Gupta RBL, Singh S, Dayal Y. Effect of punarnava on the visual acuity and refractive errors. *Indian Journal of Medical Research*.1962; **50**: 428-434.
3. Gwalwanshi, DR., Bishwas, AJ.,Vyas, D. Biodiversity of ethnomedicinal plants used by traditional healers in selected remote villages of Panna district (Madhya Pradesh), India. *Journal of Medicinal Plants*, 2014; **2**(1).
4. Hooker JD. *The Flora of British India*. Vol. 2. L. Reeve and Co., Ashford, Kent, England 1879;pp. 78-99.
5. Jain SK., De Filippis, RA. *Medicinal plants of India*. Reference Publications, 1991.
6. Kant S, Pandey S. Ethnomedicinal plants used for diarrhoea and dysentery by Tribal people of Sonbhadra district, Uttar Pradesh, India. *Flora and Fauna*. 2021; **27**(2): 228-230.
7. Kapoor LD.*Handbook of Ayurvedic Medicinal plants*. CRC, USA, 1989.
8. Kareti SR.,Rajpoot, VS. Ethnobotanical survey of folk medicinal plants used in tribal villages of Amarkantak region of Central India. *Plant Biosystems-An International Journal Dealing with all Aspects of Plant Biology*. 2022; **156**(4) : 1019-1038.
9. Kirtikar KR, Basu BD. *Indian Medicinal Plants*, vol I, II III and IV (second reprint) IBD, Dehradun, 1981.
10. Kirtikar KR, Basu BD. *Indian medicinal plants*.2nd(Ed.). Volume III. Dehradun: International Book Distributors, 1999; pp.1783-1787.
11. Mishra, SK., Sangwan, NS., Sangwan, RS. Phcog rev.: Plant review *Andrographis paniculata* (Kalmegh), A review, *Pharmacognosy Reviews*. 2007; **1**(2) : 283-298.
12. Mudgal V, Khanna KK, Hajra PK. *Flora of Madhya Pradesh*, Volume II (Botanical Survey of India, Calcutta). 1997.
13. Pandey S, Patel D, Mishra P, Tiwari R. Morphological, phytochemical and pharmacological study of *Helicteresisora* (Marorphali). *International Journal of Research in Pharmacy and Pharmaceutical Sciences*, 2021; **6** (3) : 13-17.
14. Poddar S, Sarkar T, Choudhury S, Chatterjee S, Ghosh P. Indian traditional medicinal plants: A concise review. *International Journal of Botany Studies*. 2020; **5** (5) : 174-190.
15. Pushpangadan P. CBD, WTO and the biodiversity Act of India. *J. Ethnopharmacol*.1995; **17**: 2-12.
16. Ramesh, K., Suman, NR. Floristic diversity of Panna National Park, MP. *Journal of Economic and Taxonomic Botany*, 2009; **33** (4): 846-868.
17. Roy, GP. *Flora of Madhya Pradesh: Chhatarpur and Damoh*. APH Publishing, 1992.
18. Singh, NP., Khanna, KK., Mudgal, V., Dixit, RD. *Flora of Madhya Pradesh. Vol. III, Botanical Survey of India, Calcutta*, 2001; 587.
19. Thakur RK, Puri HS, Hussain A. *Major medicinal plants of India*. CIMAP, Lucknow, 1989.
20. Trivedi, PC. *Medicinal plants: traditional knowledge*. IK International Pvt Ltd.2006.
21. <https://indiabiodiversity.org/species/show/32452>
22. <https://indiabiodiversity.org/species/show/230153>
23. <https://indiabiodiversity.org/species/show/31155>
24. <https://pubmed.ncbi.nlm.nih.gov/27320046/>
25. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7811807/>
26. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3296350/#:~:text=%5B1%5D%20The%20plant%20is%20used,Orissa%2C%20Chhattisgarh%20and%20Madhya%20Pradesh.>
27. https://www.researchgate.net/publication/332250334_Phytochemical_and_pharmacological_studies_on_wrightia_tinctoria [https://www.sciencedirect.com/science/article/pii/S0378874121005912.](https://www.sciencedirect.com/science/article/pii/S0378874121005912)
28. [https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/tinospora-cordifolia.](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/tinospora-cordifolia)