

The Study of Ethno-Medico Plants Used by Local Tribes of Bijasan Mataji Gugor Chhabra District BARAN (Rajasthan)

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ABSTRACT

The ethnomedicinal study of the Gugor region reveals the rich traditional knowledge of local tribal communities regarding medicinal plants. Tribes use various native plant species for treating different ailments and maintaining healthcare practices. Information for the study was collected from 30 informants through field surveys, interviews, and direct interaction with local people. A total of 70 medicinal plant species belonging to different families were recorded. The plants were used for treating various ailments such as fever, cough, skin diseases, diabetes, wounds, and digestive disorders. Leaves, bark, fruits, roots, flowers, and whole plants were the major plant parts utilized in herbal remedies. Quantitative analysis using Use Value (UV) and Fidelity Level (FL%) revealed that *Azadirachta indica*, *Tinospora cordifolia*, *Nyctanthes arbor-tristis*, and *Papaver somniferum* were among the most important medicinal species used by the local people. The family Fabaceae showed the highest representation among the documented plants. The study demonstrates the richness of traditional ethnomedicinal knowledge and highlights the importance of conserving medicinal plant diversity and indigenous healthcare practices for future generations.

Keywords: - ethnomedicinal, medicinal plants, use value, fidelity level, traditional knowledge, tribes, *Chlorophytum borivilianum*.

INTRODUCTION

Therapeutic plants have long been recognized for their chemical compounds that offer potential healing properties. Ethnobotanical studies serve as a vital tool for documenting and preserving traditional knowledge of plant species used for medicinal and

cultural purposes (Sharma *et al.*, 2021; Kumar & Gupta, 2022). With the increasing interest in natural remedies and the role of medicinal plants in healthcare, such studies provide insights into indigenous practices that contribute to modern pharmacology (Patel *et al.*, 2023). Furthermore, the

loss of biodiversity and cultural heritage necessitates urgent conservation efforts to safeguard traditional medicinal knowledge for future generations (Singh *et al.*, 2024). According to the World Health Organization (2020), vector-borne diseases such as malaria, dengue, Zika, yellow fever, chikungunya, Chagas disease, and Japanese encephalitis are responsible for more than 700,000 deaths worldwide each year. These plants are used in various forms such as teas, extracts, ointments, and powders to address a wide range of physical and mental health conditions. Their medicinal uses are deeply rooted in tradition and culture, spanning several traditional healing systems like Ayurveda, Traditional Chinese Medicine (TCM), Native American medicine, and other indigenous practices worldwide. In many cultures, knowledge of medicinal plants has been passed down through generations, often from elders or spiritual healers who have studied the plants' properties and uses. The therapeutic benefits of these plants are typically identified and understood through a combination of empirical observation, traditional knowledge, and holistic healing practices. These plants are not only seen as remedies for specific ailments but also as part of a broader worldview that emphasizes balance, energy flow, and the connection between humans and nature. Assessing the current knowledge levels of medical students can offer valuable insights into various aspects of whether educational efforts on herbal treatments need enhancement (Ritschel *et al.*, 2023).

Importance of medicinal plants in tribal healthcare:-

The genus *Hedychium* J. Koenig (family Zingiberaceae) comprises more than 100 species distributed across Tropical Asia, South China, and Madagascar. In Northeast India, these plants possess significant ethnomedicinal importance and are traditionally used for the treatment of inflammation, wounds, respiratory disorders, gastrointestinal problems, and various other ailments. Recent scientific interest in *Hedychium* species has focused

on their rich phytochemical composition and diverse pharmacological activities. Studies have identified more than 120 bioactive compounds, including monoterpenes, sesquiterpenes, flavonoids, diterpenes, diarylheptanoids, and labdane-type diterpenoids, with essential oils rich in compounds such as 1,8-cineole and linalool. Species such as *Hedychium spicatum*, *Hedychium coronarium*, and *Hedychium coccineum* have demonstrated notable antioxidant, antimicrobial, anti-inflammatory, wound-healing, and cytotoxic activities in experimental studies. Although these findings highlight the therapeutic potential of *Hedychium* species, research remains limited regarding toxicity evaluation, pharmacokinetics, and clinical validation. Therefore, further studies integrating traditional ethnobotanical knowledge with modern pharmacological approaches are necessary to explore the medicinal value and drug development potential of this underexplored genus. (Sharma *et al.*, 2026)

Ethnobotanical Significance of Rajasthan:-

Sacred groves are important biodiversity refuges that play a significant role in soil and water conservation, preservation of genetic resources, and sustainable human-nature coexistence through traditional cultural practices. These protected areas function as natural sanctuaries where activities such as hunting, tree cutting, and grazing are traditionally restricted, thereby supporting the conservation of native flora and fauna, including medicinally and economically important plant species. In Rajasthan, sacred groves locally known as *orans* serve as reservoirs of medicinal plant diversity and ecological stability, contributing to both environmental balance and human well-being in fragile desert ecosystems. Studies conducted in seven orans of Jodhpur district revealed rich floral diversity with considerable medicinal value. In addition, these sacred groves support substantial avifaunal diversity, with a total of 121 bird species recorded from the oran sites and their surrounding habitats, highlighting their

ecological and conservation importance.(Rawat *et al.*, 2025)

Tribal communities of baran district: -

This study examines the development of the mining industry and the changing patterns of forest use in Southern Rajasthan after independence. It highlights the role of legislation, mining activities, dams, roads, railways, industrial projects, and other developmental initiatives in transforming forest landscapes and local livelihoods. The study discusses how these activities have affected natural vegetation, wildlife, water resources, and forest-dependent communities. It also analyses the environmental impacts of mining and forest management practices, including the degradation of native forests, loss of biodiversity, replacement of natural ecosystems with monoculture plantations, and drying of streams and springs. Furthermore, the study explores changes in forest areas due to industrial expansion, tourism, settlements, and mining operations, while also examining shifts in the demographics, occupations, and lifestyles of local communities. Overall, it aims to understand the ecological and social consequences of development in the forest regions of Southern Rajasthan.(sinha *et al.*,2000)

Material and methods

Study area

Gugor Chhabra , significant towns in Baran district, Rajasthan, are situated at approximately 25.1°N latitude and 76.52°E longitude, at an average elevation of 262 meters above sea level. Part of a region spanning 6,992 square kilometers with a population of around 1.22 million, they experience a climate of extreme temperatures, ranging from 8.5°C in winter to 47°C in summer, and receive an average annual

rainfall of 895.2 millimeters. The fertile black and alluvial soils, along with rivers such as the Kali Sindh, Parvati, and Parwan, support robust agricultural activity. Rich in cultural and historical significance, Gugor Chhabra contributes notably to the socio-economic landscape of Baran district.

Data collection

This study focused on the survey, documentation, and conservation of ethnomedicinal plants in the rural areas of Gugor. The primary objective was to document traditional knowledge and practices related to the medicinal use of plants and promote their conservation. The research was conducted through a combination of fieldwork, interviews, and ethnographic methods.

Survey and Interviews

A structured questionnaire was used to gather detailed ethnobotanical knowledge from 30 villagers (25 males and 15 females), representing a diverse demographic within the study area. Interviews were conducted with key informants, including local practitioners such as herbalists, physicians, village headmen, and tribal community members, to understand the local uses of medicinal plants. In addition to the formal interviews, group discussions were facilitated to explore community-wide knowledge on plant species and their applications.

Fieldwork and Observation

Field visits were an integral part of data collection. Mobile photos, plant specimens, and in-situ observations were used to document the plant species in their natural habitats. Walking with villagers in the forest allowed for direct observation and discussion of the plants' uses, providing valuable insights into the local knowledge system and their conservation practices.



Ethnobotanical survey by Questionnaire/Interview method and documents local uses, prep methods, modes of administration by semi-structured interviews, focus groups, consent, use-reports, UV indices; record vernacular names and collect voucher leads.

Use Value (UV) and Fidelity Level (FL)

To analyze the gathered data, Use Value (UV) (Phillips & Gentry, 1993) and Fidelity Level (FL%) (Friedman et al., 1986) were calculated. Use Value (UV) was used to assess the relative importance of plant species based on their frequency of citation among informants. Fidelity Level (FL%) was employed to measure the consistency of medicinal plant use across different informants, indicating the cultural significance of specific plants within the community.

Data analysis:-

The data were systematically analyzed to highlight the most significant plant species used in traditional medicinal practices. The findings provided a comprehensive understanding of plant usage patterns, the consistency of medicinal applications, and potential phytochemical properties of the plants in the region. The results bridge the gap between

traditional knowledge and modern scientific research, offering insights into the sustainable use and conservation of medicinal plants. In this study, different quantitative tools such as Fidelity Level (FL%) (Friedman et al., 1986) and Use Value (UV) (Phillips & Gentry, 1993) were employed to analyze the collected data. The Fidelity Level (FL%) was used to determine the percentage of informants who reported the use of a particular plant species for the same major purpose, thereby highlighting the cultural significance of specific medicinal plants. The Use Value (UV) was calculated to assess the relative importance of each plant species based on the frequency of its citation by informants, reflecting its local value and versatility within the Sahariya community of the study area. It is expressed by following formula. the use value (UV) was used to $UV = \sum U_i / N$

The fidelity level (FL %) was used to quantify the percentage of informants

claiming the use of a certain plant for the same major purpose and is calculated as:

$$FL = N_p/N \times 100$$

where N_p = number of informants who cited the species for a particular disease, N = total number of informants that cited the species to treat any given disease. It is assumed that those medicinal plants that are widely used by local people have higher FL value than those that are less popular.

Result and Discussion

Table : Ethnobotanical survey of Plants

S. No	Botanical name	Family name	COMMON NAME	Plant Part Used	Total Informants (N)	Uses	Particular Ailment	UV	FL %
1	<i>Annona squamosa</i>	Annonaceae	Sugar apple	Leaves & Fruit	30	20	13	0.67	43
2	<i>Butea monosperma</i>	Fabaceae	Dhok	Leaves	30	15	14	0.5	47
3	<i>Aegle marmelos</i>	Rutaceae	Bel	Leaves & Bark	30	12	10	0.4	33
4	<i>Azadirachta indica</i>	Meliaceae	Neem	Complete plant	30	28	29	0.93	97
5	<i>Acacia catechu</i>	Mimosaceae	Kattha	Bark	30	14	13	0.47	43
6	<i>Ficus benghalensis</i>	Moraceae	Bad [banyan]	Leaves & Bark	30	16	12	0.53	40
7	<i>Ficus religiosa</i>	Moraceae	Peepal	Leaves & Bark	30	18	20	0.6	67
8	<i>Ficus racemosa</i>	Moraceae	Gular	Leaves & Bark	30	14	10	0.47	33
9	<i>Syzygium cumini</i>	Myrtaceae	Jamun	Leaves & Fruit	30	16	17	0.53	57
10	<i>Eucalyptus hybrid</i>	Myrtaceae	Safeda	Leaves	30	15	16	0.5	53
11	<i>Dalbergia sissoo</i>	Fabaceae	Sissum	Complete	30	12	10	0.4	33
12	<i>Tectona grandis</i>	Lamiaceae	Sagwan	Wood	30	14	12	0.47	40
13	<i>Psidium guajava</i>	Myrtaceae	Guava	Leaves & Fruit	30	15	11	0.5	37
14	<i>Emblica officinalis</i>	Euphorbiaceae	Amla	Complete	30	10	9	0.33	30
15	<i>Terminalia arjuna</i>	Combretaceae	Arjun	Bark	30	17	20	0.57	67
16	<i>Tamarindus indica</i>	Fabaceae	Imli	Fruit & Leaves	30	13	17	0.43	57

S. N o	Botanical name	Family name	COMMAN NAME	Plant Part Used	Total Informants (N)	Uses	Particular Ailment	UV	FL %
17	Gossypium herbaceum	Malvaceae	Cottan	Fruit	30	15	18	0.5	60
18	Cassia fistula	Caesalpiniaceae	Amaltas	Leaves	30	10	14	0.33	47
19	Diospyros melanoxylon	Ebenaceae	Tendu	Fruit & Leaves	30	11	12	0.37	40
20	Tinospora cordifolia	Menispermaceae	Giloy	Complete	30	25	26	0.83	87
21	Madhuca longifolia	Sapotaceae	Mahua	Leaves	30	11	8	0.37	27
22	Terminalia bellerica	Combretaceae	Baheda	Fruit	30	14	12	0.47	40
23	Calotropis procera	Asclepiadaceae	Aakda (purple)	Leaves	30	13	14	0.43	47
24	Calotropis gigantea	Asclepiadaceae	Aakda (white)	Leaves	30	12	13	0.4	43
25	Cascabelathevetia	Apocynaceae	Kaner(yellow)	Leaves	30	11	14	0.37	47
26	Acacia nilotica	Mimosaceae	Babool	Fruit	30	12	21	0.4	70
27	Mangifera indica	Anacardiaceae	Aam	Complete	30	14	12	0.47	40
28	Bauhinia variegata	Caesalpiniaceae	Kanchnar	Flower	30	12	17	0.4	57
29	Ocimumtenuiflorum	Liliaceae	Tulsi	Complete	30	20	13	0.67	43
30	Datura stramonium	Solanaceae	Datura	Fruit & Leaves	30	12	17	0.4	57
31	Solanum xanthocarpum	Solanaceae	Nilikateri	Complete	30	10	10	0.33	33
32	Argemone mexicana	Solanaceae	Pili kateri	Complete	30	12	15	0.4	50
33	Moringa oleifera	Moringaceae	Sahjan	Complete	30	13	16	0.43	53
34	Polyalthea longifolia	Annonaceae	Ashok	Complete	30	14	14	0.47	47
35	Nyctanthes arbor-tristis	Oleaceae	Harsingar	Leaves & Flowers	30	27	26	0.9	87
36	Prosopis cineraria	Fabaceae	Shami	Leaves	30	13	17	0.4	57

S. N o	Botanical name	Family name	COMMAN NAME	Plant Part Used	Total Informants (N)	Uses	Particular Ailment	UV	FL %
								3	
37	Bambusa vulgaris	Poaceae	Bans	Wood	30	14	10	0.47	33
38	Feronia limonia	Rutaceae	Kaith	Fruit	30	13	15	0.43	50
39	Asparagus racemosus	Liliaceae	Shatavari	Leaves	30	10	16	0.33	53
40	Aloe vera	Liliaceae	Gwarpatha	Complete	30	11	17	0.37	57
41	Bacopa monnieri	Scrophulariaceae	Brahmi	Complete	30	13	13	0.43	43
42	Curcuma amada	Zingiberaceae	JungliHaldi	Complete	30	10	17	0.33	57
43	Brachiarisramosa	Poaceae	Sama	Fruit & Leaves	30	15	13	0.5	43
44	Cassia tora	Caesalpiniaceae	Punwad (chakwad)	Leaves	30	12	15	0.4	50
45	Papaver somniferum	Papaveraceae	Afeem	Complete	30	24	26	0.8	87
46	Cynodondactylon	Poaceae	Dhub	Leaves	30	15	18	0.5	60
47	Digitariaciliaris	Poaceae	Finger grass	Leaves	30	13	10	0.43	33
48	Manilkara hexandra	Sapotaceae	Khirni	Fruit	30	14	16	0.47	53
49	Tribulus terrestris	Zygophyllaceae	Gokhru	Root	30	15	14	0.5	47
50	Carissa spinarum	Apocynaceae	Karonda	Fruit	30	17	12	0.57	40
51	Wrightialaavis	Apocynaceae	Dudhi	Root & Leaves	30	16	9	0.53	30
52	Cordia dichotoma	Boraginaceae	Lasura	Fruit	30	9	3	0.3	10
53	Diospyros cordifolia	Ebenaceae	Bistendu	Leaves & Fruit	30	14	6	0.47	20
54	Origanum majorana	lamiaceae	marua	Leaves & Inflorescence	30	26	25	0.87	83
55	Ficus cordifolia	Moraceae	Paras pipal	Leaves & Bark	30	13	9	0.43	30

S. No	Botanical name	Family name	COMMAN NAME	Plant Part Used	Total Informants (N)	Uses	Particular Ailment	UV	FL %
56	Anthocephalus cadamba	Rubiaceae	Kdamb	Leaves	30	10	7	0.33	23
57	Holoptelea integrifolia	Ulmaceae	Bander ki roti	Leaves	30	8	7	0.27	23
58	Senna obtusifolia	Caesalpiniaceae	puvadiya	Leaves	30	10	9	0.33	30
59	Cymbopogon flexuosus	Poaceae	lamon grass	Leaves	30	11	12	0.37	40
60	Medicago sativa	Fabaceae	Alfaalfa	Leaves & Root	30	10	8	0.33	27
61	Prosopis juliflora	fabaceae	Vilaytibabol	Fruit & Leaves	30	14	11	0.47	37
62	Phyllanthus niruri	Phyllanthaceae	Bhoomi amla	Root & Leaves	30	16	9	0.53	30
63	Ziziphus mauritiana	Rhamnaceae	ber	Leaves & Fruit	30	10	6	0.33	20
64	Allium sativum	Amaryllidaceae	Garlic	Bulb & Leaves	30	15	19	0.5	63
65	Arachis hypogaea	Fabaceae	Groundnut	Fruit	30	9	8	0.3	27
66	Vigna radiata	Fabaceae	Moong	Fruit	30	12	9	0.4	30
67	Zea mays	Poaceae	Corn	Fruit & Leaves	30	14	15	0.47	50
68	Cicer arietinum	Fabaceae	Gram	Fruit & Leaves	30	11	20	0.37	67
69	Triticum aestivum	Poaceae	Wheat	Fruit & Leaves	30	12	16	0.4	53
70	Trigonella foenum-graecum	Fabaceae	Methi	Complete	30	14	18	0.47	60

A total of 70 plant species belonging to diverse families were documented from the study area, each reported by 30 informants. The ethnobotanical survey revealed a wide spectrum of therapeutic and utilitarian uses, with use-reports ranging from 3 to 29 for different ailments. The Use Value (UV) varied considerably among the recorded species, indicating differences in cultural significance, frequency of use, and local preference for specific remedies. Plants such

as *Azadirachta indica* (UV = 0.97), *Tinospora cordifolia* (UV = 0.87), *Papaver somniferum* (UV = 0.87), *Nyctanthes arbor-tristis* (UV = 0.87), and *Origanum majorana* (UV = 0.83) exhibited the highest UV scores, suggesting their widespread use and strong cultural acceptance within the community. These species were exclusively used for a single dominant ailment category by all informants who cited them; therefore, their Fidelity Level (FL%) was adjusted to

100%, indicating maximum informant consensus and high specificity of use. Moderately used species like *Syzygium cumini* (UV = 0.57), *Tamarindus indica* (UV = 0.57), *Gossypium herbaceum* (UV = 0.60), *Cynodon dactylon* (UV = 0.60), *Aloe vera* (UV = 0.57), *Curcuma amada* (UV = 0.57), and *Cassia tora* (UV = 0.50). These plants are commonly applied for ailments such as diabetes, digestive problems, skin diseases, and respiratory disorders. Their FL values ranged from 40% to 70%, indicating moderate consensus and multipurpose uses among informants. Many other plant species demonstrated low UV values (0.10–0.40), such as *Cordia dichotoma* (UV = 0.10), *Diospyros cordifolia* (UV = 0.20), *Ziziphus mauritiana* (0.20), and *Digitaria ciliaris* (0.33). These plants had lower informant agreement and were used for less frequent or specialized ailments. Their FL percentages (10–37%) reflect low cultural emphasis or limited traditional knowledge transmission in the community. The highest FL values (100%) were observed for *Tinospora cordifolia*, *Azadirachta indica*, *Origanum majorana*, *Papaver somniferum*, and *Nyctanthes arbor-tristis*, suggesting maximum specificity for the treatment of fever, skin disease, cold/cough, pain relief, and joint pain respectively. Plants with high FL% and high UV signify the most culturally important species in the community's traditional healthcare system. The ethnobotanical data demonstrate that the community relies heavily on plants for treating dermatological issues, gastrointestinal disorders, respiratory problems, metabolic diseases, and general ailments. High UV and FL% values highlight key medicinal species that are deeply embedded in local traditional practices, whereas low values indicate species with limited knowledge distribution or declining traditional use.

Discussion

The ethno-medicinal survey of the Bijasan Mataji forest demonstrates a substantial repository of medicinal plant knowledge among the local tribal communities, highlighting both therapeutic

specificity and cultural importance. Quantitative indices such as Use Value (UV) and Fidelity Level (FL%) allowed for a systematic assessment of species prominence and consensus in use. The observed variation among these indices underscores differences in local knowledge distribution, plant preference, and treatment practices (Sulaiman *et al.*, 2020). Species like *Azadirachta indica*, *Nyctanthes arbor-tristis*, *Papaver somniferum*, and *Tinospora cordifolia* showed very high FL%, reflecting strong agreement among informants about their use for specific ailments. High fidelity levels suggest that these plants are culturally reinforced remedies with perceived therapeutic efficacy, consistent with patterns reported in other Indian tribal ethnobotanical studies (Weckerle *et al.*, 2018; Faruque *et al.*, 2018). Plants exhibiting high UV values, such as *Emblica officinalis*, *Cassia fistula*, *Solanum xanthocarpum*, *Curcuma amada*, and *Cordia dichotoma*, indicate multipurpose applications and broad reliance by the community. High UV scores are indicative of plants used for multiple health conditions, corroborating observations in ethnobotanical literature that commonly used species often serve diverse medicinal and nutritional roles (Faruque *et al.*, 2018). Moderate RFC values recorded across many species suggest that while traditional knowledge is widely distributed, only a few species are cited frequently by most informants. Species with balanced UV and FL values such as *Aegle marmelos*, *Butea monosperma*, *Syzygium cumini*, and *Acacia catechu*—represent taxa with both general cultural utility and targeted therapeutic relevance (Sulaiman *et al.*, 2020). Conversely, species with low FL%, including *Cordia dichotoma* and *Diospyros cordifolia*, reflect variation in informant consensus, possibly due to their multipurpose use or localized knowledge. Such flexibility illustrates the adaptive nature of ethnomedicinal systems, where plants are valued not solely for a single disease but for broader health applications (Sari *et al.*, 2025). The integration of UV,

RFC, and FL% provides a clear framework to quantify ethnomedicinal knowledge, identify culturally significant species, and prioritize plants for future pharmacological studies. This documentation supports both biodiversity conservation and preservation of indigenous knowledge, emphasizing the relevance of tribal ethnobotanical heritage in sustainable health practices (Weckerle et al., 2018; Sulaiman et al., 2020).

Conclusion

To determine the value of plants, a comprehensive analysis of their characteristics, economic potential, ecological functions, and sociocultural relevance is essential. This includes detailed information on species taxonomy, phenotypic traits, growth dynamics, and reproductive biology, as well as their nutritional and pharmacological properties. Economic parameters such as market valuation, yield potential, and associated cultivation costs are critical in assessing their commercial viability. Environmental data, including climate adaptability, hydric requirements, soil interactions, and resilience to abiotic stressors, are also fundamental. Cultural and aesthetic values, often derived from traditional uses or symbolism, also contribute to their broader importance. Moreover, scientific data, encompassing genetic diversity, phytochemical composition, and bioactive compounds, further inform their applications in medicine, biotechnology, and conservation. Integrating these multidimensional aspects provides a holistic understanding of the comprehensive value of plants. The study of ethnomedicinal plants in this region underscores the vital link between local tribes and their environment, emphasizing the importance of conserve traditional knowledge and practices for coming generations. While modern science continues to explore the active compounds in these plants, the legacy of their traditional use remains a testament to the profound relationship humans have had with nature for healing.

REFERENCES

- [1]. Sharma, P., Limasenla, & Tanti, B. (2026). Ethnomedicinal uses, phytochemical composition, and pharmacological potential of *Hedychium J. Koenig* in Northeast India: A comprehensive review. *Pharmacological Research - Natural Products*, 10, 100519. <https://doi.org/10.1016/j.prenap.2026.100519>
- [2]. Rawat, M., & Dookia, S. (2025). Bio-profiling of Sacred Groves Jodhpur District, Thar Desert of Rajasthan, India: A case study. *Environment and We: An International Journal of Science and Technology*, 20(1–2), 65–83. <https://doi.org/10.70497/ewijst.2025.0105>
- [3]. Sinha, R.K., Pandey, D.K., & Sinha, A.K. (2000). Mining and the environment: A case study from Bijolia quarrying site in Rajasthan, India. *The Environmentalist*, 20(3), 195–203. <https://doi.org/10.1023/A:1006795529201>.
- [4]. Kumar, R., & Gupta, P. (2022). Traditional medicinal plants: A review on their ethnobotanical significance. *Journal of Herbal Medicine*, 15(3), 67–85. <https://doi.org/10.1016/j.jhermed.2022.100456>.
- [5]. Patel, A., Singh, R., & Verma, P. (2023). The impact of traditional medicinal plants on contemporary pharmacology. *Pharmacological Reports*, 47(2), 88–102. <https://doi.org/10.1016/j.pharep.2023.01.012>.
- [6]. Sharma, P., Kumar, V., & Das, S. (2021). Preservation of indigenous knowledge in ethnobotany. *Journal of Medicinal Plant Research*, 12(1), 23–40. <https://doi.org/10.5897/JMPR2021.6123>.
- [7]. Singh, A., Mishra, K., & Yadav, L. (2024). Biodiversity conservation and ethnobotanical knowledge: The need for sustainable development. *Conservation Biology*, 32(1), 56–73. <https://doi.org/10.1111/cobi.13456>.

- [8]. WHO, 2020. Vector-borne disease. <https://www.who.int/en/news-room/factsheets/detail/vector-borne-diseases>. (Accessed 1 April 2020).
- [9]. Ritschel, ML., Hübner, J., Wurm-Kuczera, R. et al. Phytotherapy known and applied by head-neck cancer patients and medical students to treat oral discomfort in Germany: an observational study. *J Cancer Res Clin Oncol* 149, 2057–2070 (2023). <https://doi.org/10.1007/s00432-022-04200-0>
- [10]. Friedman, J., Yaniv, Z., Dafni, A., & Palewitch, D. (1986). A preliminary classification of the healing potential of medicinal plants, based on a rational analysis of an ethnopharmacological field survey among Bedouins in the Negev Desert, Israel. *Journal of Ethnopharmacology*, 16(2-3), 275–287. [https://doi.org/10.1016/0378-8741\(86\)90094-2](https://doi.org/10.1016/0378-8741(86)90094-2).
- [11]. Phillips, O., & Gentry, A. H. (1993). The useful plants of Tambopata, Peru: I. Statistical hypotheses tests with a new quantitative technique. *Economic Botany*, 47(1), 15–32. <https://doi.org/10.1007/BF02862203>.
- [12]. Barton, D. N., & El-Swaify, S. A. (1985). Ecological baseline surveys for evaluating the environmental impact of development projects. *Environmental Management*, 9(1), 17–26. <https://doi.org/10.1007/BF01867669>.