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Scientometrics Study on Ethnobotanical Research in India (2000-2024)

Kiran Ranavagol S.[1]; Dr. Kiran P. Savanur[2]

Research Scholar, Dept. of Library and Information Science, Rani Channamma University Belagavi, Karnataka India[1]; Associate Professor, Dept. of Library and Information Science, Rani Channamma University Belagavi, Karnataka India[2]

ranavagolkiran@gmail.com; kps@rcub.ac.in

ABSTRACT

Ethnobotanical research in India is essential for understanding the dynamic link between humans and plants, and it is firmly rooted in historical and cultural settings. This study emphasizes the importance of ethnobotany in India's various sectors while also recognizing concerns such as the loss of traditional knowledge and sustainable methods. The article assesses the increasing number of publications in ethnobotanical research and the methods adopted in the field in India. Also, the paper identifies knowledge gaps by emphasizing the specific research, regions, and communities engaged in the original study. Through meticulous data analysis and interpretation, trends in research articles, regional distributions, and community participation are examined. Key findings reveal a constant increase in research articles, emphasizing specific regions such as the South, North, and Northeast. The Peninsular Plateau, Indian Himalayan, and North-East Region emerge as key research regions due to their abundant biodiversity. Ethnic populations, notably tribes like Bhotia, Gujjar, and Gond, make important contributions to ethnobotanical research. The current situation stresses the need for continued assistance and cooperation to promote scientific advancement, the preservation of indigenous knowledge, and ethnobotanical study in India.

KEYWORDS: Ethnobotanical Research, Scientometrics, Bibliometrics, and India.

INTRODUCTION

In India, ethnobotany is recognised as a vital field of research investigating the complex link between humans and plants, particularly regarding indigenous knowledge and traditional uses. The field has evolved, gaining national and worldwide prominence, and is now integrated into academic curricula and research agendas [1]. Despite being a relatively recent subject of scientific investigation, ethnobotany has a deep-rooted history in Indian culture, with documented knowledge extending back to the Vedas and a great diversity of plants and tribal people adding to its wealth [2] [3]. Interestingly, while the area has experienced an increase in scholarly publications and research interest, there is concern over the loss of traditional knowledge and plant types due to development and changes in tribal lifestyles [4]. The potential for ethnobotanical studies to contribute to medication development and conservation efforts is contrasted with obstacles such as over-harvesting and loss of traditional medical knowledge

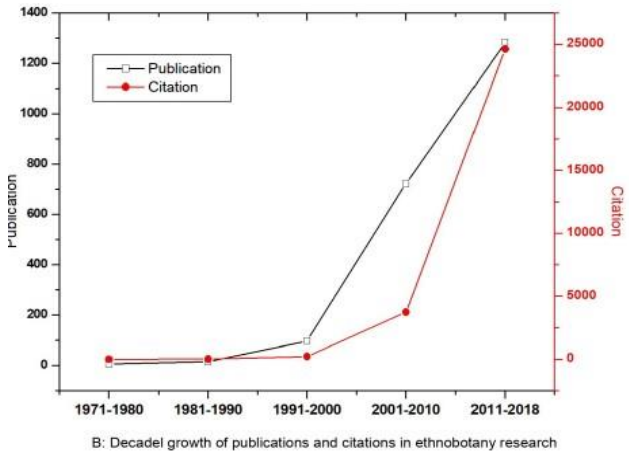
[5] [6]. Ethnobotanical research in India is developing and has the potential to contribute to several sectors, including bioprospecting, medicine development, and biodiversity conservation [7].

However, it is critical to address the difficulties of knowledge erosion and sustainable practices to conserve and continue this unique traditional *learning* [8] [9]. Ethical considerations are paramount in ethnobotanical research, with the need for agreements that respect local communities' rights and share benefits [10]. There is also a call for expanding research to include underexplored aspects such as unused or abandoned plants and the relationship of ethnobotany to other disciplines [11]. In Brazil, a related ethnobotanical study identified knowledge gaps and regional disparities in research focus, which may also be relevant to the Indian context [12]. Lastly, the emerging field of ethnobotany genomics in India presents new opportunities and challenges, emphasizing the need for an innovation system that responds to dynamic socio-environmental changes [13].

In conclusion, India's ethnobotanical research has a long history, is producing more and more scientific work, and has made major contributions to preserving traditional knowledge and creating new medications. However, it encounters challenges like the need for ethical research methods and the deterioration of conventional knowledge. Ethnobotany genomics is one of the emerging fields that the field is exploring, and it offers both potential and challenges for innovation and sustainable development.

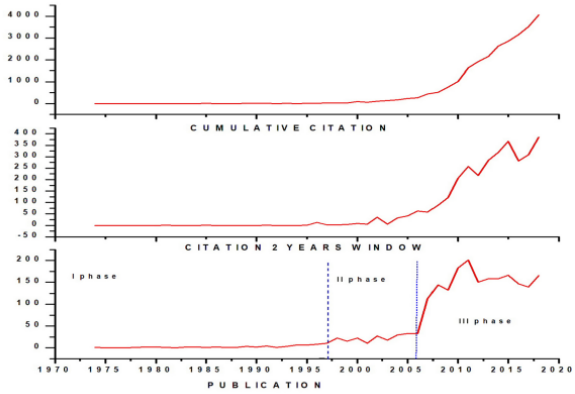
HISTORICAL BACKGROUND: [2]

Over several decades, scholarly activity gradually increased in India, marking the past of ethnobotanical research. In India, ethnography—the study of the interactions between humans and plants, especially in traditional societies—has been practiced since antiquity, with a notable surge in research production noted starting in the 1950s. [14]. The first research paper in a Science Citation Index (SCI) journal was published in 1974 by R. S. Chakravarthy [15], and from then until 2018, a total of 2123 papers have been published, indicating a growing interest and recognition of the field [2].



B: Decadel growth of publications and citations in ethnobotany research

Interestingly, the publication trends in ethnobotanical research in India can be divided into three distinct phases: an initial phase with single-digit yearly publications, a second phase with double-digit publications, and a third phase starting in 2007 with annual triple-digit publications [14]. This expansion results from the growing recognition of the value of ethnobotanical knowledge, particularly when it comes to drug development and natural resource management [5].



A: Trends of publications and citations in ethnobotany research

SIGNIFICANCE OF THE STUDY

A substantial corpus of scientific work that has grown throughout time and a strong heritage of indigenous knowledge define the past of ethnobotanical research in India. Drug discovery, the preservation of traditional medical knowledge, and the conservation of medical plant resources are just a few of the zones that have advanced from the research. Because of India's tremendous biodiversity and the vast knowledge that indigenous cultures have about the usage of plants, ethnobotany research is fundamental. Drug development, bioprospecting, and the preservation of natural resources and cultural variety all depend on this research [2]. India's many tribes and varied flora offer a special setting for ethnobotanical research, which has seen a sharp rise in academic publications over time, reflecting a growing interest in and appreciation for the field's importance. The contribution of ethnic people and biomes that influence the development of ethnobotany in the nation is examined in this study, with a focus on the trends and methodological approaches in the field. Furthermore, merging the traditional medicine system with modern medicine can improve healthcare strategies, but it also brings up issues with intellectual property rights and the sustainable use of plant resources [5]. Future research should address the gaps in ethnobotanical studies and focus on conservation efforts to ensure the longevity of both the natural resources and the social inheritance they represent.

LITERATURE REVIEW

To comprehend publication trends, historical development, and research hotspots, scientometrics—a quantitative approach to analyzing research literature—has been used more and more in the medical field [16]. This article offers a thorough analysis of Malaysia's diabetes-related scientific research output between 2000 and 2018. The study identifies Kuala Lumpur as the hub of scientific output in this field using several databases and creative methodologies, with the Medical Journal of Malaysia serving as a crucial publication platform. The results show that to effectively address the growing diabetes epidemic, further research and cooperative measures are required [17]. Saussurea is the most diversified genus in the Asteraceae family, with roughly 27 ethnobotanically noteworthy species found in Eurasian temperate zones. The findings show that entomophily is the primary route of pollination for all Saussurea species, with outcrossing common. India has emerged as a major contributor to studies on the genus, particularly in reproductive biology and ethnobotanical applications. Top journals for publication include "Journal of Ethnopharmacology," "Plos One," and "Journal of Ethnobiology and Ethnomedicine." Notably, research on conservation, ethnopharmacology, and species like Saussurea lappa has received high citations, indicating possible pharmaceutical applications [18].

In India, ethnobotany, or the awareness of plants used by indigenous tribes, is vital for bioprospecting, drug development, and cultural preservation. India's diverse plant species and varied tribes make it an ideal destination for ethnobotanical research. A study used Scientometrics to map scholarly articles on ethnobotany in India. Between 1974 and 2018, a total of 2123 papers were published. Publication trends revealed three distinct periods, with an increase in annual publications over time. The Indian Journal of Traditional Knowledge (IJTK) was the most popular, with the top-cited paper concentrating on antidiabetic herbs published in the Journal of Ethnopharmacology in 2002 [2]. highlights a significant increase in ethnobotanical publications in India, with a notable rise in the number of publications and citations over time. points out the challenges in compiling historical ethnobotanical data due to the scattered nature of the literature. These findings underscore the geographical and methodological disparities in ethnobotanical research, as well as the growth of the field over time [19]. Ethnobotanical Research in Brazil This study sought to define the present state of ethnobotanical research in Brazil using published scientific journals from 1988 to 2013. It aimed to discover knowledge gaps and trends within the profession. The analysis identifies an increasing number of publications in ethnobotanical research, demonstrating a growing interest and involvement in the subject over time. The article investigates the primary approaches used in ethnobotanical research, offering insights into the methods used to explore plant use by indigenous populations. Focus Regions and Community: The majority of papers focused on northeast and southeast Brazil, with Caatinga and Atlantic forests being the most studied biomes. Though metropolitan areas are gaining attention, most research has concentrated on rural populations. The study revealed gaps in studies in the Amazon, Cerrado, Pampa, and Pantanal regions as well as a lack of human resources in ethnobotanical research, pointing to areas that require more financing and investigation [12].

OBJECTIVE

- ✓ To assess the year-wise growth in Ethnobotanical Research in India
- ✓ To find which region is involved more in the scientific production of Ethnobotanical Research in India
- ✓ To find which community is the highest contributor to the Ethnobotanical Research in India
- ✓ To find the use of channels for scientific publication in Ethnobotanical Research in India

METHODOLOGY

MATERIAL AND METHODS USED IN THIS STUDY

- ***preliminary survey:*** To search for articles, a preliminary survey was conducted to cover the journals that publish articles on ethnobotany and ethnomedicine publications in India (The Indian Journal of Knowledge Traditional, Journal of Ethnopharmacology, and Journal of Medicine Plants were included) From this search, the researcher has selected articles based in India that contained the words ethnobotany and ethnomedicine in the title, abstract, or keywords. To cover all the publications researcher utilized 'Publish or Perish' Software for the comprehensive collection of data and MS Excel was used to create tables and Plot graphs.
- ***Database used to locate literature:*** To strengthen the survey, Researcher has used the databases Scopus (http://www.scopus.com) PubMed, and Google Scholar (Compared with PubMed, the average search in Google Scholar retrieved twice as many relevant articles [20]).

- ***Keywords:*** The researcher used the keywords Ethnobotany (OR) Ethnomedicine (AND) India* in the search fields "title," "abstract," and "keywords." All articles found on databases from 2000 to 2024 were analyzed and later selected. In these searches, only the articles that investigated the relationships of human groups to plants and animals were selected.
- ***Screening Process:*** After the selection of studies pertinent to the proposed survey, the researcher extracted the following information: (1) the year of publication of the article, (2) the region/state in which the study was performed, (3) type of approach, (4) biome in which the study was performed [12]. However, the researcher used only those articles including primary data and excluded all literature reviews and meta-analyses.

REGION-WISE

For this study, the researcher looked at numerous political zones in India, including North, West, South, East & Northeast, Southeast, Northwest, and Central India, as defined by the Indian government [21]. Kerala (KL), Tamil Nadu (TN), Karnataka (KR), Andhra Pradesh (AP), and Telangana (TS) are part of the South region, while Rajasthan, Uttar Pradesh, Delhi, and other states are in the North. The Eastern area includes West Bengal (WB), Odisha, and Jharkhand, whereas the Central region includes Madhya Pradesh (MP), the Upper Part of Maharashtra (MH), and the Lower Part of Uttar Pradesh (UP). The Northeast Region includes Arunachal Pradesh (ARP), Assam (AM), Manipur, Meghalaya, Mizoram (MZ), Nagaland (NL), Tripura, and Sikkim. Finally, the North West Region comprises Rajasthan (RJ), Punjab (PN), and the lower part of Uttarakhand (UK).

APPROACH-WISE

The diverse approaches utilized in each study were thoroughly examined, resulting in the categorization of articles into five distinct fields: Ethnobotany in General, which explores how people of a particular culture and region utilize indigenous plants [22]. Ethnoveterinary is a field dedicated to safeguarding animal health and treating illnesses using traditional beliefs, indigenous knowledge, and practices [23]. Ethnomedicine, in General, is a branch of anthropology that delves into cultural interpretations, beliefs, and notions regarding illness and health among ethnic and indigenous communities globally, spanning centuries [24]. Ethnomedicine, in particular, focuses on comprehending diverse healing practices for various ailments [25].

BIOMES AND PHYSICAL REGION

The researcher found seven unique geographic zones and biomes. These regions include the Peninsular Plateau, which includes South India and sections of Central India such as the Western Ghats, Eastern Ghats, Deccan Plateau (DP), and Coastal Region (CR). The Indian Himalayan Region (IHR) includes Jammu and Kashmir (J&K), Himachal Pradesh (HP), Uttarakhand (UK), Sikkim, Arunachal Pradesh (ARP), Nagaland (NL), Manipur (MNP), Mizoram (MZ), Tripura (TR), Meghalaya (MG), and portions of Assam (ASM) and West Bengal (WB). The Desert Region includes parts of Rajasthan, Gujarat, Punjab, and Haryana [26]. The Andaman and Nicobar Islands, as well as the Lakshadweep Islands, are part of the Island Region, whereas the North-East Region contains Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura [27].

ETHNIC GROUPS/COMMUNITIES INVOLVED IN THIS STUDY

India is a vast and diverse country, home to several ethnic tribes, each with their own distinct culture, language, and traditions. These tribes are frequently found in specific places around the country, with a total of 705 tribes in India. The country is also home to a diverse range of plants, including 18386 angiosperms, 79 gymnosperms, 1289 pteridophytes, 2748 bryophytes, 2511 lichens, 15115 fungi, and 7357 algae. The survey covered 194 ethnic and tribal tribes, with the Gondas being the largest tribe spread across the Deccan plateau. Other tribes include the Santhals, Bhils, Khasis and Garos, Nagas, Munda, Oraon, Lambadas (Banjaras), Todas arawas, Sentinalese, and other tribes inhabiting the Andaman and Nicobar Islands, which have mostly stayed isolated from the outside world [28].

DATA ANALYSIS AND INTERPRETATION

Table 1 and Figure 1 show how the number of research articles on ethnobotany and ethnomedicine in India has gradually increased over time. The peak years for publication were 2014 and 2015, with 34 and 36 publications, respectively. Despite changes, the annual number of publications has remained continuously high, notably since 2009. When comparing the number of publications in recent years (2023 and 2024) to the peak years of 2014 and 2015, there appears to be a small decrease.

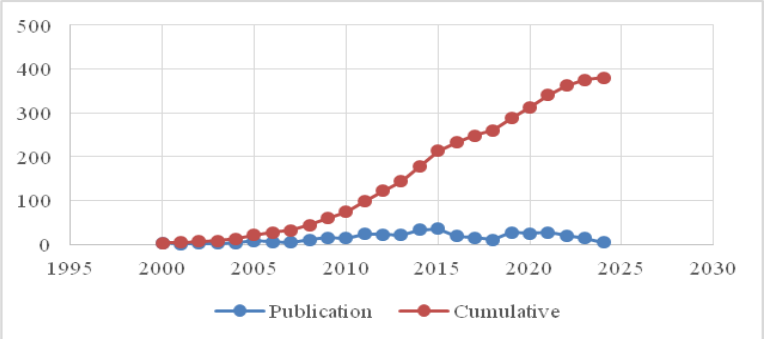


Figure-1 Year-wise Publications Ethnobotany in India

Table 2 and Figure 2 describe India's region-specific publications on ethnobotany and ethnomedicine. The South region, which includes states such as Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, and Telangana, has the most publications (112, or 29.40%). The North, which comprises states such as Rajasthan, Uttar Pradesh, and Delhi, ranks second with 91 publications (23.88% of the total). Other regions, such as the Eastern Region (10.24%) and the Northeast Region (18.11%), contribute significantly to the total number of publications. "General (No-Region)" refers to publications that have not been assigned to a specific region (India). This category accounts for 3.41% of all publications.

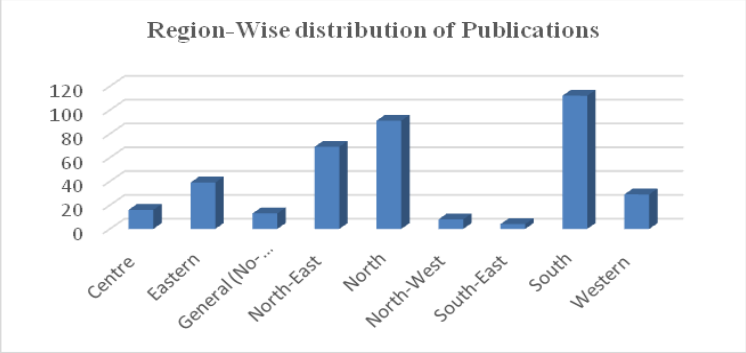


Figure-2

Table 3 and Figure 3 describe Physical Region-Wide Publications in Ethnobotany and Ethnomedicine. The Peninsular Plateau Includes south India and part of central (Western Ghats, Eastern Ghats, Deccan Plateau, and Coastal Region). This region has the highest percentage of publications (38.58%), followed by the Indian Himalayan Region (22.57%) and the North-East Region (18.37%). The North-East region is also a key area of focus. This region is well-known for its great biodiversity, which includes several indigenous people with traditional plant knowledge. The Plain of Ganga, Sindh, and Sundarbans Region accounts for 10.50% of all publications. It encompasses the rich plains that surround the Ganges River, as well as the Sundarbans mangrove forest. Desert Region Despite its less hospitable environment, the desert region accounts for 4.46% of all publications. Research in this area could focus on flora adaptation techniques and desert community traditional knowledge. General (India): This category, which includes general publications from India without mentioning a specific place, accounts for 3.67% of the total publications, whereas Islands, which are often distinguished by unique flora and cultural traditions, account for 1.84%.

Table-3 Physical Region and Biomes -Wise publication in Ethnobotany

Sl. No.	Physical Region	Publication	%
1	Desert Region	17	4.46%
2	General (India)	14	3.67%
3	Indian Himalayan Region	86	22.57%
4	Island Region	7	1.84%
5	North-East Region	70	18.37%
6	Peninsular Plateau	147	38.58%
7	Plain of Ganga, Shind and Sundar Bans Region	40	10.50%
Total		381	100.00%

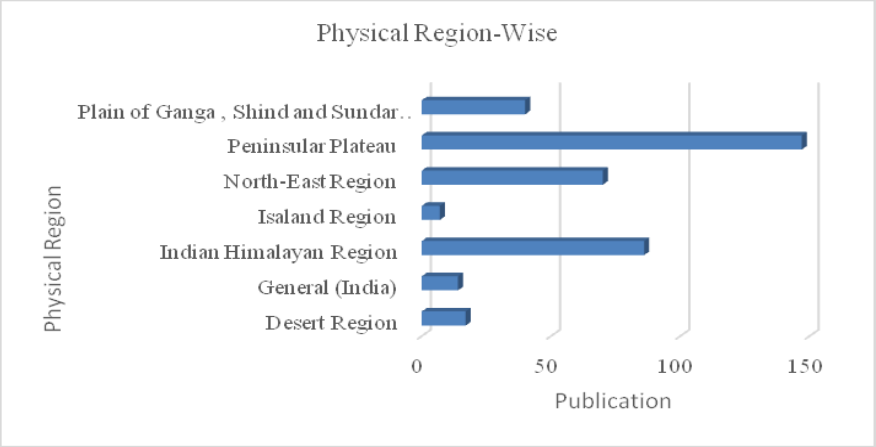


Figure-3

Table 4 and Figure 4 illustrate ethnobotany studies by community in India. There have been 852 articles on ethnobotany studies in diverse Indian groups, with 194 communities participating. Some communities have a higher number of publications, such as Bhotia, Gujjar, and Gond, with 44 (2.58%), 41 (2.41%), and 39 (2.29%), respectively. The wide range of plant-related cultural knowledge and customs emphasizes the necessity of documenting and maintaining ethnobotanical knowledge in India's various tribes. It demonstrates that ethnobotanical knowledge is equitably distributed across the country.

Table-4 Top- Ethnobotany Studies on Community-wise in India

Sl. No	Community	Publication	%
1	Bhotia	44	2.58%
2	Gujjar	41	2.41%
3	Gond	39	2.29%
4	Bhil	32	1.88%
5	Santhal	27	1.58%
6	Mina	19	1.12%
7	Paliyartribals	17	1.00%
8	Irula	16	0.94%
9	Indigenous	14	0.82%
10	Kurumba	14	0.82%
11	Lohit	14	0.82%
12	Munda	14	0.82%
13	Hakkipikki	13	0.76%
14	Kondh	13	0.76%
15	Sauras	13	0.76%
16	Gouli	12	0.70%
17	Kattunayaka	12	0.70%
18	Oraon	12	0.70%
19	Sidhi	12	0.70%
20	Vokkaliga	12	0.70%
21	Paniyan	11	0.65%
22	Saharia	11	0.65%
23	Garasia	10	0.59%
24	Kadar	10	0.59%
25	Malayali	10	0.59%
26	Sabar	10	0.59%
27	Toda	10	0.59%

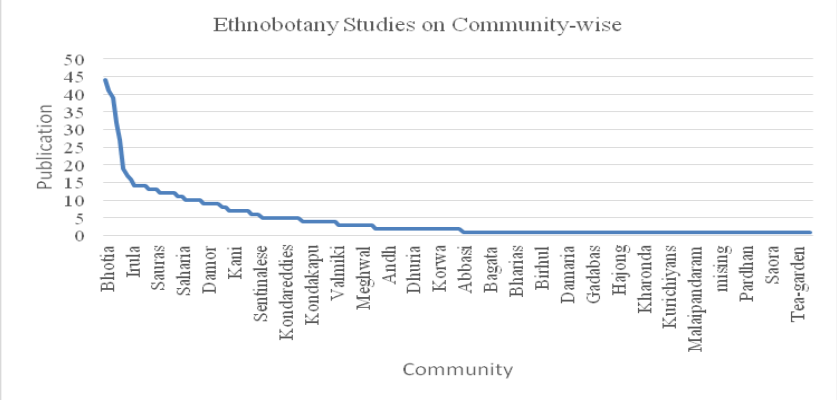


Figure-4

Table 5 and Figure 5 show approach-wise publication in ethnobotany. Ethnobotany, in general, has the highest percentage of publications (24.15%), a comprehensive approach to exploring the interaction between plants and people that most likely includes traditional knowledge, cultural behaviours, and plant use in various situations. Ethnobotany in Particular comes in second, accounting for 19.69% of all articles, focusing on specialized features or case studies within ethnobotany. It may explore further into certain communities, plant species, or traditional behaviours, yielding more specialized insights than the broader approach. Ethnoveterinary studies account for 4.99% of publications and entail the research of traditional knowledge and practices connected to the use of plants in animal healthcare, demonstrating the importance of ethnobotanical knowledge in Ethnoveterinary. Medicinal in General accounts for 34.12% of the papers, demonstrating a strong emphasis on the medicinal characteristics and applications of plants in ethnobotanical research. It indicates a widespread interest in investigating the medicinal potential of traditional plant-based treatments. Medicinal in Particular: With 17.06% of papers, this category focuses on individual medicinal plants or remedies, providing more extensive insights into their pharmacological qualities, usage patterns, and cultural importance.

Table-5 Approach-wise Publication

Sl. No	Approach	Publication	%
1	Ethnobotany in General	92	24.15%
2	Ethnobotany in Particular	75	19.69%
3	Ethnoveterinary	19	4.99%
4	Medicinal in General	130	34.12%
5	Medicinal in Particular	65	17.06%
Total		**381**	**100.00%**

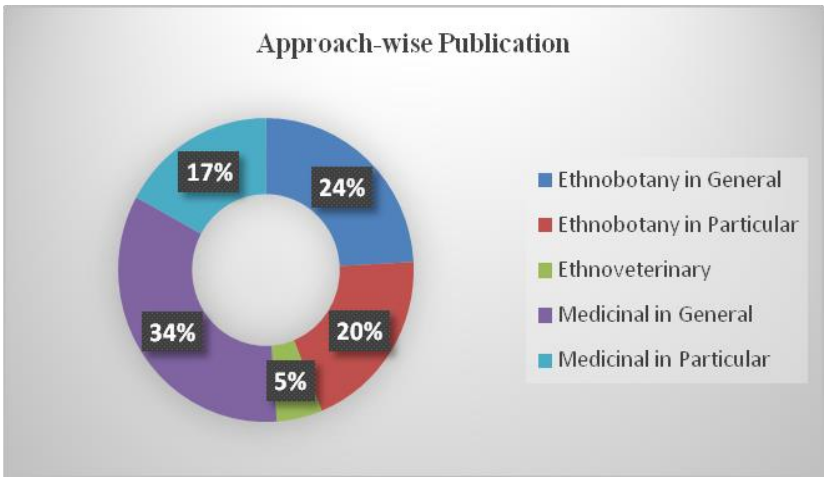


Figure-5

Table 6 and Figure 6 show year-wise citations of the Siddha domain, Early Years (2000–2005) Citations were modest, with a significant increase in 2005. Growth Period 2006-2011 Citations increased significantly, reaching their peak in 2011. Peak Years (2012-2016) Between 2012 and 2016, there was a large increase in citations, with 2014 and 2015 being particularly noteworthy. Stability and Fluctuation (2017–2024): Following the peak years, citation numbers have stabilized and fluctuated, with different percentages each year. The data for 2024 show a drop

in the amount of citations over the previous years. The total number of citations provides a cumulative assessment of the research impact over time, with consistent growth.

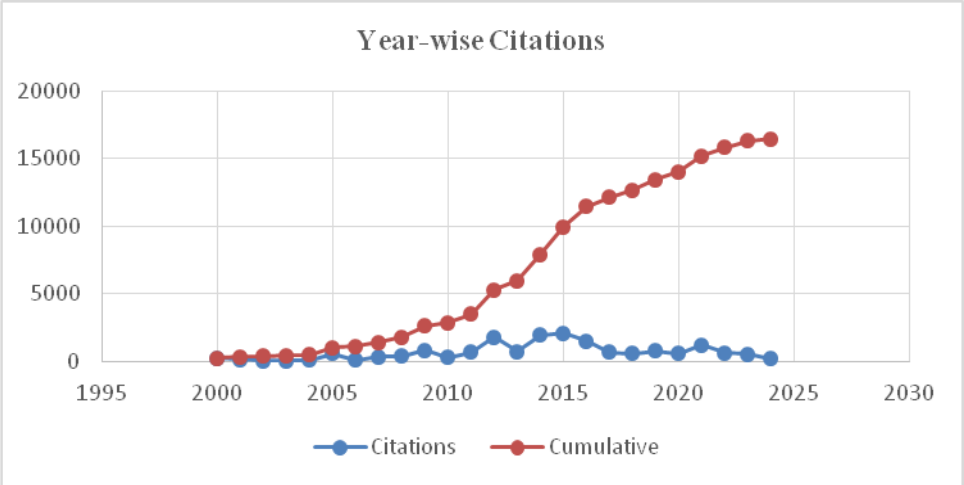


Figure-6

Table 7 illustrates the top Five highly cited papers in the Siddha domain. Phytochemical Screening and Antioxidants: The paper by Datta et al. (2016) stands out as the most cited, indicating a significant interest in the phytochemical composition and antioxidant properties of medicinal plants. Followed by Ethnopharmacology and Ethnobotanical Knowledge: Several papers focus on ethnopharmacology and ethnobotanical knowledge, highlighting the importance of indigenous practices and traditional wisdom in Siddha medicine. Studies by Singh et al. (2015), Tiwari et al. (2014), Ayyanar and Ignacimuthu (2005), and Juyal and Ghildiyal (2017) explore the medicinal properties of plants used by different indigenous communities, such as the Gujjar tribe and the Kani tribals, for various health conditions. The papers cover diverse geographical regions, including Odisha, Kashmir, Tamil Nadu, and Jammu and Kashmir. Each paper investigates the use of medicinal plants for specific health conditions prevalent in the respective regions. These include antioxidants, rheumatism, and musculoskeletal disorders. This targeted approach reflects a systematic effort to identify potential herbal remedies for prevalent health issues, aligning with the principles of ethnobotany.

Top-Five Highly Cited Papers in Ethnomedicine (2000-2024)

Cites	Authors	Title	Year
1086	Datta T, Patra AK, D5astidar SG.	Phytochemical Screening and Antioxidants. Properties of Five Medicinal Plants from Niyamgiri Hill, Kalahandi, Odisha, India.	2016
786	A Singh, GS Singh, PK Singh	Ethnopharmacology and phenology of high-altitude medicinal plants in Kashmir, Northern Himalaya	2015
479	D Tiwari, AN Sah, S Bawar	Ethnobotanical knowledge among the semi-pastoral Gujjar tribe in the high altitude (Adhwari's) of Churah subdivision, district Chamba, Western Himalaya	2014

461	M Ayyanar, S Ignacimuthu	Ethnomedicinal plants used by Kani tribals to treat Rheumatism in Kalakad Mundanthurai Tiger Reserve, Tamil Nadu, India	2005
452	P Juyal, JC Ghildiyal	Inventory of medicinal herbs utilized for the treatment of musculoskeletal disorders in district Kupwara of Jammu and Kashmir	2017

Table 8 and Figure 7 demonstrate the use of scientific communication channels. The Journal of Ethnopharmacology is the most prolific source of publishing, accounting for 17.85% of all articles. The Indian Journal of Traditional Knowledge (IJTK) and the Journal of Medicinal Plants Studies share the title for second place, accounting for 12.07% of total publications. Both offer platforms for research into traditional knowledge systems and therapeutic plants. Ethnobotany Research and Applications and Studies on Ethno-Medicine: These journals account for 8.92% and 8.40% of total articles, respectively. They specialize in ethnobotanical research, encompassing a wide range of themes relating to traditional plant knowledge and therapeutic uses; six journals each have one publication in this field.

Table-8 Use of Channels of Scientific Communication

Sl.No.	Source	Publication	%	Cumulative
1	Journal of ethnopharmacology	68	17.85%	68
2	Indian Journal of Traditional Knowledge (IJTK)	46	12.07%	114
3	Journal of Medicinal Plants Studies	46	12.07%	160
4	Ethnobotany Research and Applications	34	8.92%	194
5	Studies on Ethno-Medicine	32	8.40%	226
6	Journal of Ethnobiology and Ethnomedicine	23	6.04%	249
7	International Letters of Natural Sciences	20	5.25%	269
8	Journal of Natural Remedies	15	3.94%	284
9	Asian Pacific Journal of Tropical Biomedicine	12	3.15%	296
10	International Journal of Ethnobiology & Ethnomedicine	9	2.36%	305
11	Journal of Global Biosciences	9	2.36%	314
12	Journal of Medicinal Plants Research	9	2.36%	323
13	Indian Journal of Natural Products and Resources	6	1.57%	329
14	Journal of Applied Pharmaceutical Science	6	1.57%	335
15	India Pharmaceutical Biology	5	1.31%	340
16	Asian Journal of Pharmaceutical and Clinical Research	4	1.05%	344
17	International Journal of Pharmaceutical Research	4	1.05%	348
18	Journal of Herbs, Spices and Medicinal Plants	4	1.05%	352

19	Journal of Pharmacy and Pharmaceutical Sciences	4	1.05%	356
20	Asian Pacific Journal of Tropical Disease	3	0.79%	359
21	Current Science	3	0.79%	362
22	European Journal of Integrative Medicine	3	0.79%	365
23	African Journal of Pharmacy and Pharmacology	2	0.52%	367
24	American-Eurasian Journal of Sustainable Agriculture	2	0.52%	369
25	Ecology of Food and Nutrition	2	0.52%	371
26	Environment, Development and Sustainability	2	0.52%	373
27	Herba Polonica	2	0.52%	375
28	Asian Journal of Plant Sciences	1	0.26%	376
29	Curr Pharm Biotechnol	1	0.26%	377
30	Dental Hypotheses	1	0.26%	378
31	Pharmaceutical Biology	1	0.26%	379
32	Recent Pat Biotechnol	1	0.26%	380
33	World Journal of Current Medical and Pharmaceutical	1	0.26%	381
Total		381	100.00%	

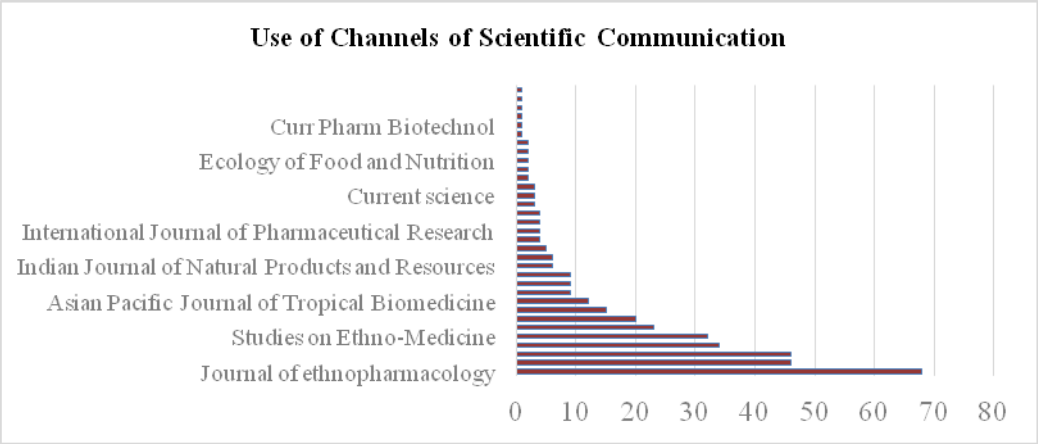


Figure-7

The theme of core journals is taken from Bradford's Law of Scattering, which was formulated by Samuel Clement Bradford in 1934 (Sudhier, 2010). Bradford's law is one of the several statistical explanations about how scientific work is scattered or distributed in journals. If a journal is ranked by the number of articles, it includes on a given topic it can be divided into a central nucleus of the most important journals and a series of zones each containing the same number of articles as the nucleus.

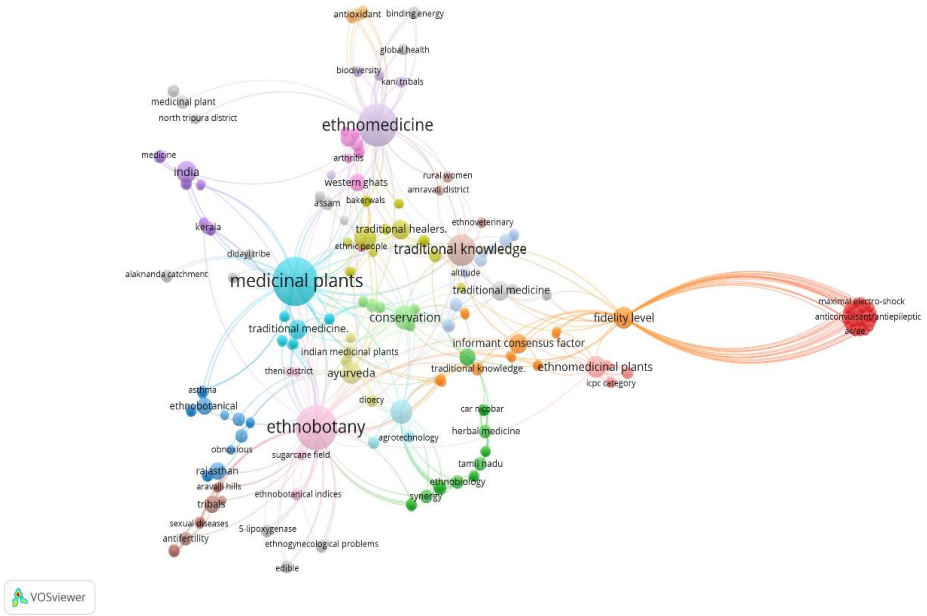
In Table 6, a dataset of 91 journals has been discovered in the nucleus zone, with an average Bradford's multiplier of n=3.7. Consequently, the average number of journals in the 3 zones is 6:14:71. Due to the high % of error (10.34), it is evident that the dataset does not fit well with Bradford's law. As a result, the researcher has implemented Liemkuhers Egge's model to examine Bradford's law. Liemkuhler's Egge's model tests Bradford's Law using an exponential function. The resecher has computed the Bradford Multiplier as 4.375 and the Bradford constant (β) as 0.4811. Utilizing the formula, the projected number of journals for Zone 1 is 2 (actual: 2), for Zone 2 is approximately 3 (actual: 4), and for Zone 3 is around 5 (actual: 27). The notable deviation in Zone 3 indicates that the data does not comply with Bradford's Law, as Liemkuhler's model anticipates fewer journals than observed in higher zones. Therefore, according to Liemkuhler's model, this data does not conform well to Bradford's Law, particularly in higher zones, signifying a significant departure from the anticipated distribution.

Table-9 Distribution of Publications and journals according to zones

Zones	Journals	Articles	Bradford Multiplier
1	2	114	
2	4	135	
3	27	132	
	33	381	4.3

AUTHOR-KEYWORDS ANALYSES

Figure 8 explains that the words reflect the diverse topics covered in the publications, ranging from traditional healing practices to the conservation of medicinal plant knowledge among tribal communities in India. *Traditional medicine, Medicinal plants, Ethnobotanical, Ethnomedicinal plants, Ayurveda, Herbal medicine, Ethnomedicine, Traditional knowledge, Ethnoveterinary, Antioxidant, Conservation, Tribal, Ethnogynecological, Informant consensus factor, and Ethnobiology* are the highly assigned keywords by the authors in the publications.



KEY FINDINGS

- ***Trend in Research Articles:*** Research articles on ethnobotany and ethnomedicine in India have steadily increased over time, peaking in 2014 and 2015. Although there has been a minor reduction in recent years (2023 and 2024) compared to the peak years, the overall number of publications is high.
- ***Regional Distribution:*** The South region of India, which includes states like Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, and Telangana, has the most publications, followed by the North region. Other regions, such as the North-East and Eastern regions, contribute heavily.
- ***Physical Region-Wise Publications:*** Ethnobotanical research is mostly focused on the Peninsular Plateau, Indian Himalayan Region, and North-East Region, highlighting their rich biodiversity and indigenous knowledge.
- ***Community-wise Studies:*** The study comprises diverse Indian cultures, including significant contributions from communities like Bhotia, Gujjar, and Gond, indicating that ethnobotanical knowledge is widely diffused across numerous tribal groups.
- ***Approach in Ethnobotanical Studies:*** Ethnobotany in general and medicinal studies in particular are the prominent methodologies, focusing on the exploration of traditional plant knowledge and therapeutic characteristics.
- ***Scientific Communication Channels:*** Journals like the Journal of Ethnopharmacology, Indian Journal of Traditional Knowledge (IJTK), and Journal of Medicinal Plants Studies are significant forums for publishing ethnobotanical research.

CONCLUSION

In conclusion, the trends in ethnobotanical and ethnomedicinal research in India reveal a dynamic landscape marked by constant expansion, regional variety, and a strong connection with indigenous knowledge systems. These patterns highlight the ongoing importance of ethnobotanical study in India, contributing to the larger conversation on biodiversity conservation and traditional medicinal practices. Continued support and collaboration in this sector are critical for expanding our understanding and realizing the potential of ethnobotanical resources for the benefit of humanity. Despite problems like as knowledge erosion and the need for conservation initiatives, the field is growing, providing vital insights into the relationship between people and plants in India. Future studies should address gaps in ethnobotanical studies and focus on conservation measures to preserve their longevity.

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