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A Scientometric Estimation of Ayurveda Research Publications for the Period 2022-2024: A Pilot Study

Purbi Dey Kanungo[a] and Charu Lata[b]*

[a]Academy of Scientific and Innovative Research (AcSIR), CSIR-HRDC Campus, Ghaziabad, Uttar Pradesh 201002, India

[b]Principal Scientist, CSIR- National Institute of Science Communication and Policy Research, 14 Satsang Vihar Marg, New Delhi-110067, India

Email: purbiy2k7@gmail.com; charulata@niscpr.res.in

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Ayurveda is the system of remedy that advanced in India and has survived as a discrete identity from remote olden times to the present day. A pilot study has been undertaken to understand the trend of publications in the last three years in Ayurveda using various scientometric parameters. The main aim of the current study is to assess the quality of research and achievements as well as identify gaps in Ayurveda research using various scientometric and statistical tools. Study was conducted based on data collected from 4 major databases namely Web of Science (WoS), Scopus, PubMed and Digital Helpline for Ayurveda Research Articles (DHARA). To obtain a comprehensive result 15 keywords have been used on Ayurveda. A total of 619 publications were identified after removing duplicates. The analysis of the data shows a good number of publications in Ayurveda from China (23), USA (22) and many major countries of the world. From India, Central Council for Research in Ayurvedic Sciences (CCRAS) has the maximum number of publications (39) and *Journal of Ayurveda and Integrative Medicine* published by World Ayurveda Foundation and Trans-Disciplinary University, Bengaluru has maximum publications of 141 articles. The study concludes that Scopus database has the most diverse and inclusive research data on Ayurveda, and may be used as single source for future studies. The study has potential to be taken up in details for a more comprehensive analysis of Ayurveda research landscape in the country and worldwide. There is a need to understand the ongoing research in the field of Ayurveda which is a way to promote the Ayurveda Science and also foster curiosity and desire amongst the young research scientists of Ayurveda who can be the torch bearers in this field.

Keywords: Ayurveda, Database, Publications, Scientometrics, Statistical Tools

Introduction

Since times immortal humans have tried to discover medicines, and find ways for prevention of diseases that human beings have the chances of acquiring. Ayurvedic Science is one such knowledge which is ancient and deep rooted. Ayurveda is the name which the earliest Indians gave to the "Science of life". As such, Ayurveda applies to the science by which the awareness of which life can be improvised or in general benefits the human. There are four renowned sacred books of ancient India eg: *Rigveda, Samveda, Yajurveda* and *Atharveda* which elaborate various aspects of life. Ayurveda is a subsection of Atharvaveda.[1]

Today a large number of organizations and Institutes are engaged in the research of finding suitable drugs (in form of herbs, medicine) preparing from various Ayurvedic formulations to find a cure for various difficult ailments. People from various spheres of life are now depending on Traditional sources of medicine like Ayurveda, homeopathy, unani etc. Today, there is a growing academic attention towards traditional knowledge (TK). With unique health challenges of the 21st century, interest in Traditional medicines (TM) is undergoing a revival. Medical professionals and researchers are engaged in exploring the deep knowledge found our ancient knowledge systems and its relevance in the modern world with scientific perspective. There has been concerted focus on integration of various Indian systems of medicine (ISM) including Ayurveda, Unani, Siddha, Yoga etc. with contemporary medical science for creating holistic healthcare approaches for multiple ailments. The Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH) is primarily responsible for the regulation of traditional medicines. Ministry of Ayush, GoI has initiated multiple projects to propagate the need and use of Ayurveda for the benefit of people. Various CSIR laboratories are also engaged in research based on Ayurvedic principles and drugs and also trying to propagate the uses of traditional medicines. Recent times have seen a surge in Ayurveda publications in various Journals dedicated to this field. It was also observed during the study that there is a huge

coverage of the articles in various renowned databases like Web of Science, Scopus, PubMed and Dhara. Considering the importance of Ayurveda science, there is an urgent need to understand the growing horizon and future landscape of research and development in this important disciplineScientometric study on Ayurveda using various Scientometric tools to analyze the trend of publications will showcase the progress and also point the challenges and limitations in progress of research in that particular subject field. Scientometrics is the field of study that is important for monitoring but analysing scholarly publications and it is a subfield of Bibliometrics. Scientometric study helps one to understand the growth and trend of research publication in a particular area. Although decent research have already been done on the scientometric/ bibliometric analysis of the articles on Ayurveda however, the authors were inspired to undertake this particular study because the present study is to study the outline and scope of research in Ayurveda and this type of research has not been done so, far. The pilot study will also pave way for a comprehensive study on the scientometric analysis on Ayurveda.

Literature Analysis

A number of studies on scientometric analysis on different sub domains of Ayurveda have been done. Most of the studies are mainly based on scientometric applications of particular herbs, and drugs of Ayurveda. So far, a comprehensive analysis of Ayurveda research using various Scientometric parameters has not been done. *Prema et al*[2] analysed 11733 publications between the period 1993-2022 to understand the growth of the publications, collaboration amongst authors, countries collaboration and various other visualization networks. The study also emphasized on the usage of herbal formulation in curing Covid-19 symptoms.

A study by Maruelraj et al[3] analyzed the scholarly research during 1923-2018. A total of 2038 papers were published during the period were collected from Scopus database. The authors analysed the total number of publications, most productive countries and organizations. Also most cited papers were mentioned in this study. *Hasan and Singh*[4] in their study did a quantitative analysis of scholarly publication in Ayurveda for the period 2001-2010. For this particular study they collected data from Science Citation Index. A total publication of 983 were recorded for the study and data interpretation was done using various scientometric parameters like country wise distribution, year wise trend, collaboration pattern, type of publication, etc.

A study on Witharia Somnifera (Ashwaganda) was done by *Gupta, Ahmed and Mueen* [5] to find the scientometric assessment of publication output during 1995-2018 using Scopus database. The annual publication output on Ashwaganda, most productive 15 organizations, productive authors were analysed during the study. *Rahman et al*[6] in the bibliometric study on Indian Medicinal Plants using Web of Science recorded the data for the period 1977-2020. For the particular study they showed the year wise trend, most relevant journals, productive organizations, prolific authors, etc. The study showed 2020 had maximum publication of N=376, Journal of Ethno pharmacology (N=125) journal has maximum contributions. *Kumar and Rajput*[7] in their study on the medicinal plant (*Phyllanthus emblica*) found that out in the 962 publications for the period 2011-2021 the number of publications have increased substantially over the years (108-2011 to 178-2021), they also analyzed degree of collaboration of authors, language wise distribution, country wise distribution and subject wise distribution of articles. A similar study on global publication output of *Glycyrrhiza glabra* was done for the period 1997-2016 by *Gupta, et al*[8]. They examined 3428 publications using Scopus and found the growth wise trend, citation trend, International Collaborative papers. China had the maximum output (19.81%) followed by India (13.71%), 113 publications were registered with highest citations ranging from 100-852.

A bibliometric analysis of 100 years of research on Himalayan cedar: Research trends, gaps and future implications were done by K*umar and Pandey*[9] for the period 1916-2024. Data of 616 documents were collected from Scopus and Biblioshiny and Vosviewer was used to analyze the data. Using various laws of bibliometrics 6 main core journals were identified during the study, Lotka's law revealed 8% authors have published more than 2 publications. The study was done to identify research gaps and future research areas.

A study of articles indexed in Ayush research portal using bibliometric analysis was done by *Thrigulla, Saketh Ram et al*[10]. To understand the trend of publications in Ayurveda clinical trial based studies.

Objectives

The present study gives the scientometric sketch of published literature of Ayurveda in the last three years (2022-2024) covering all the major databases. The paper has the following objectives:

1) To determine the leading countries, institutions and journals of Ayurveda Research.

2) To understand the trend of publications in Ayurveda along with impact of citations received.

3) To find out the nature of authorship pattern of single and multiple authored articles.

4) To determine the most promising Institutions and Journals with bulk of research and publication using Pareto analysis method.

5) To analyse the International contribution in the field of Ayurveda.

6) To analyse the trend in citations received and identification of highly cited papers.

Methodology and Data Collection

Data was collected from 4 major databases, namely, Web of Science (WoS), Scopus, PubMed and Dhara. The search involved an all-inclusive keyword search using Boolean logic "AND" and "OR" with a keyword search of 15 strings. To find these keywords a total of 1249 articles on various Ayurveda related topics were analysed randomly. The titles, abstracts and keywords of these documents were thoroughly read to narrow down on the Ayurveda search strings.

The keywords used for the study were "Ayurveda", "Ayurved", "Ayurvedic", "Ayurvedic Science", " Ayurveda Science", "Ayurved Science", " Alternate Medicine", " Ayush Veda", "Traditional System of Medicine", "Traditional Indian Medicine", "Complementary Medicine", "Integrative Medicine", "Indian medicine", "Ayurvedic Medicine" and "Alternative Medicine". The search results using 15 keywords lead to a comprehensive acquisition of data from all the 4 databases. The search results were downloaded in excel files which contained information like author affiliations, title of the article, Institution, Journals name, year of publication, Country of publication while citation count of the articles were found using Google scholar. The data was refined for the above mentioned three years, only research articles were taken for the study, preferred language was kept English. The Final data was generated in 3 stages:

Stage I: In case of Web of Science categories some of the irrelevant subject fields were excluded from the study. Subjects like Engineering multidisciplinary, polymer science, applied physics, Electrical engineering, instrumentation, Computer science, etc were not having any related papers hence these were excluded.

1) Web of Science generated a total of 758,885 data and after exclusion of all above categories a total of 67, 964 data was generated. Further refinement of subject fields generated 52150 data for the three years.

2) Scopus recorded a total of 41, 635 data which after exclusion generated 24703 total data

3) Dhara database covers a total data of 194 and all the data is relevant to our area of study.

4) Pubmed after exclusion generated a total of 10,385 data.

Stage II: The data in all the 4 databases were analysed separately and only relevant titles related to Ayurveda study were refined in excel worksheets. After excluding the irrelevant data a total of 1189 records were identified for the study.

Stage III: All the data of the 4 databases were merged and duplicates were removed using conditional formatting in excel. The final data recorded was 619. So, it was estimated that during the period 2022-2024 a total of 619 publications were recorded in Ayurveda from all over the world.

Data were analysed using various scientometric and statistical parameters, the data has been shown in the form of tables and graphs/charts to demonstrate the results prominently. The detailed study is presented below. The analysis of the study is divided into five categories and individual categories are explained further. Microsoft excel was used to design the charts/graphs for the study. The compilation of Data can be shown in three stages as shown below (Figure 1):

Results and Discussion

The main theme of scientometric study is to understand the outline of growth of publication and also to analyse the trend of publication from various Institutions/organizations, Country wise output, Journal wise output, most cited papers etc. Since, this is a pilot study hence, the trend of publication over the years was not possible but the basic trend or number of publications in the last three years was fairly captured in this study.

Three Year Publication Output

After screening the whole data 619 documents were incorporated in the final analysis. The number of

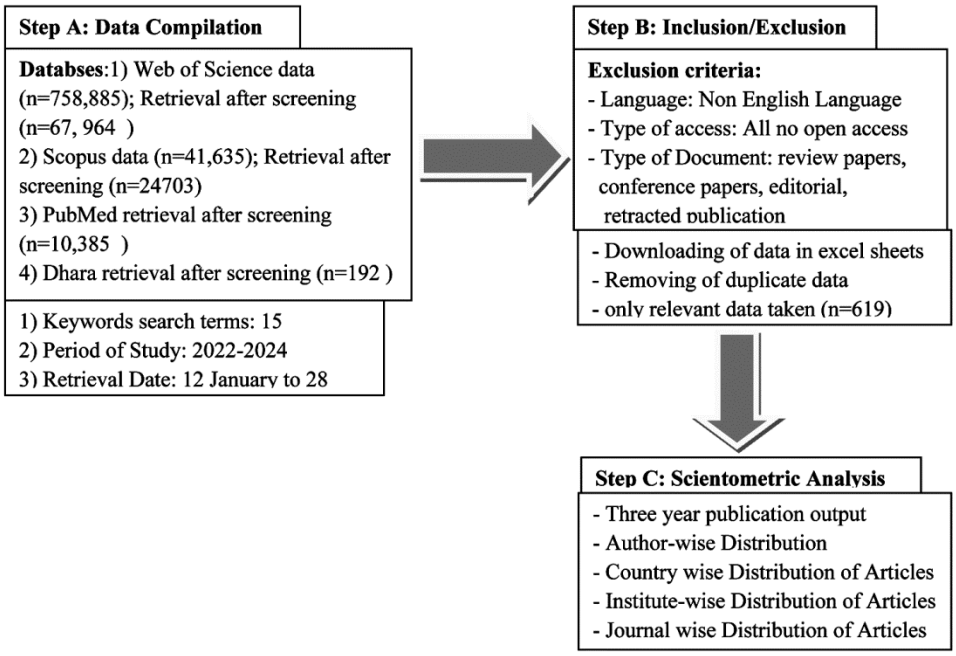
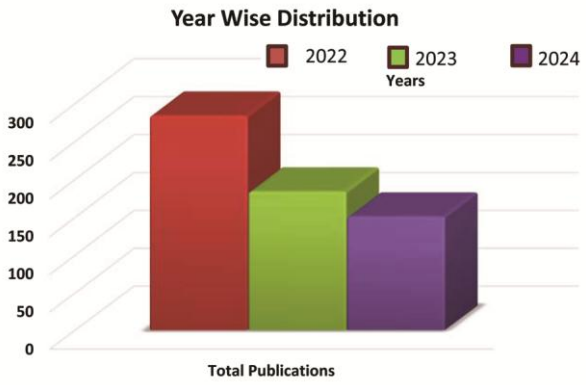


Fig. 1 — Flowchart to depict Methodology and Data Collection



Graph 1 — Year wise paper distribution

Table 1 — Three years publication trend

S. No	Year	Total Publications
1	2022	284
2.	2023	184
3	2024	151
Total		619

publications in the year 2022 was highest amongst the three years probably due to more research papers publication on Covid-19 and use of Ayurvedic herbs in management of Covid 19. The highest citation (355) was received by a paper on targeting Covid 19 using various Ayurvedic herbs. However, trend of growth of publications could not be projected in a pilot study. Table 1 and graph 1 shows the total publications during the period of study.

Author-wise Distribution

The authorship analysis for the study revealed that out of the 619 publications 52 authors were independent/single authors while 567 were collaborative/multi-authored implying a trend towards multi- authored publication. About 91.57 % of papers are being published by multiple authors. The degree of collaboration was found out to be 0.91 for the period 2022-2024

Number of Single Author Contribution (2022-2024): 52; Number of Multiple author Contributions (2022-2024): 567

A) Degree of Collaboration of Authors: The degree of collaboration of authors is found by the formula given by Subramanyam.

C= Nm/Nm + Ns

Where, C= Degree of collaboration in a discipline Nm= Number of multi-authored papers in the discipline Ns= Number of Single authored papers in the discipline

Here, Nm= 567 Ns= 52 C= 567/567+52 = 0.91

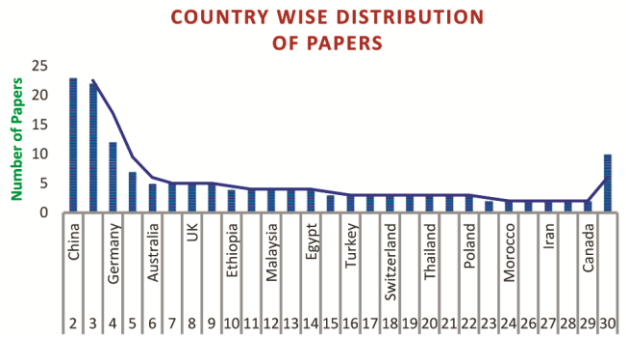
B) Collaborative Index of Authors: The collaborative index can be found by the formula

Collaborative Index= Total Number of Authors/Total Multiple Authored Papers

CI= 616/ 567= 1.08

Table 2 — Country wise Distribution of articles

S. No	Country	Number of Publications	Percentage (%)
1	India	470	75.91
2	China	23	3.71
3	USA	22	3.55
4.	Germany	12	1.93
5.	Saudi Arabia	7	1.13
6.	Australia	5	0.80
7	Bangladesh	5	0.80
8.	UK	5	0.80
9	Sri Lanka	5	0.80
10	Ethiopia	4	0.64
11	Korea	4	0.64
12	Malaysia	4	0.64
13	Russia	4	0.64
14	Egypt	4	0.64
15	Japan	3	0.48
16	Turkey	3	0.48
17	Pakistan	3	0.48
18	Switzerland	3	0.48
19	Indonesia	3	0.48
20	Thailand	3	0.48
21	Nepal	3	0.48
22	Poland	3	0.48
23	Spain	2	0.32
24	Morocco	2	0.32
26	South Africa	2	0.32
27	Iran	2	0.32
28	UAE	2	0.32
29	Canada	2	0.32
30	Others	10	1.61
Total		619	100



Graph 2 — Country wise distribution of articles

Country wise distribution of articles

As obvious among the Country wise distribution India has the maximum share of publications with 470 publications in 619 papers followed by China with 23 papers and USA 22 papers. It was quite surprising to note that research on various herbs of Ayurveda and the uses of Ayurveda drugs in various spheres are being done in most countries of the world. Ashwagandha the wonder herb which has many uses in Indian Ayurveda medicine is being researched by many countries especially Germany, China and USA. It was quite encouraging to note that research on Ayurveda is being done in small parts of the world also showing the tremendous effect of Ayurveda which is considered native to India has found its way in most parts of the world.

Table 2 and Graph 2 shows the Country wise trend of Ayurveda Research.

Institute-wise Distribution of Articles

Table 3 lists the highly productive Institutes and impact of their output. The Central Council for Research in Ayurvedic Sciences (CCRAS) has the maximum number of publications (39) followed by All India Institute of Ayurveda (25). A total of 130 Institutes listed in Appendix I shows that a number of contributions have been received on Ayurveda from worldwide institutions.

The Pareto Analysis is a standard procedure for selection of prominent contributors (Institutes in this case) from a list of large number of Institutes. It was found that a total of 372 institutions have contributed during the period of study (excluding duplicates) out of which only 19 Institutes have more than 4 publications (Top 19 with 5 or more publications) which can be considered institutes with significant number of publications. These Institutes can be considered as important Institutes publishing in this field. It also includes a column on calculating cumulative frequencies. Each value is added in the next row to show the total value and also the cumulative percentage is found out. The final value will the add of all the previous value.

Journal wise Distribution of Articles

The maximum number of researchers have a tendency to publish in the journals of the core field/area i.e., Ayurveda. However, journals publishing on interrelated subjects like complementary medicines, traditional knowledge and interdisciplinary areas also have a good coverage on Ayurveda articles. *Journal of Ethno pharmacology* has 26 publications, *Journal of Natural Remedies* have 17, *Indian Journal of Traditional Knowledge (IJTK)* also have 9 publications. Journal of Ayurveda and Integrative Medicine have the highest

Table 3 — Institute wise distribution of articles

S. No	Institute Name	No. of Publications
1	Central Council for Research in Ayurvedic Sciences (CCRAS), Ministry of Ayush,	39
2	All India Institute of Ayurveda	25
3.	Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University	17
4.	Central Ayurveda Research Institute (CARI)	14
5.	All India Institute of Medical Sciences (AIIMS)	13
6	Department of Allied and Applied Sciences, University of Patanjali	13
7.	Jawaharlal Nehru Medical College, Datta Meghe Institute of Higher Education and Research, Wardha	12
8	Savitribai Phule Pune University (SPPU), Pune	12
9	Amrita School of Ayurveda	11
10	Institute of Teaching and Research in Ayurveda, Jamnagar,	10
11	Manipal Academy of Higher Education	10
12	Indian Institute of Technology (IIT)	10
13	Dr. D. Y. Patil College of Ayurved & Research Center, Pimpri, Pune of Dr. D. Y. Patil Vidyapeeth	9
14	Council of Scientific and Industrial Research (CSIR)	8
15	University of Delhi	7
16	Indian Council of Medical Research	6
17	KLE Technological University, Hubballi	5
18	National Institute of Ayurveda, Jaipur, Rajasthan,	5
19	Parul Institute of Pharmacy and Research, Parul University	5
20	KAHER'S Shri B M Kankanawadi Ayurveda Mahavidhyalaya Shahapur, Belagavi	4
21	Sreedhareeyam Ayurvedic Eye Hospital and Research Center, Nelliakkattu Mana, Kizhakombu	4
22	State Ayurvedic College and Hospital, Lucknow University	4
23	Bharatiya Sanskriti Darshan Trust's Integrated Cancer Treatment and Research, Maharastra	4
24	Chinese Medicine, Institute of Chinese Medical Sciences, University of Macau	3
25	Era's Lucknow Medical College and Hospital, Era University	3
26	National Institute of Mental Health and Neurosciences (NIMHANS), Bengaluru	3
27	College of Ethnomedicine, Chengdu University of Traditional Chinese Medicine	3
28	Shoolini University of Biotechnology and Management Sciences, Solan	3
29	School of Pharmaceutical Sciences, Lovely Professional University	3
30	Shoolini University of Biotechnology and Management Sciences	3
31	Department of Ayurveda & Integrative Medicine, Deenanath Mangeshkar Hospital & Research Center	2
32	ICMR-National Institute of Epidemiology (ICMR-NIE), Chennai	2
33	Institute of Home Economics, University of Delhi	2
34	Integrated Cancer Treatment and Research Centre, Wagholi	2
35	Bharati Vidyapeeth Deemed University, College of Ayurveda, Pune	2
36	J. S. Ayurveda College, Nadiad	2
37	Joshi Panchakarma Clinic, Panvel, Mumbai	2
38	National Cancer Institute, NIH, Maryland	2
39	Sanjeevani Ayurveda and Yoga Centre	2
40	Regional Ayurveda Research Institute for Drug Development, Gwalior	2
41	S.I.V.A.S Health & Research Institute, Sunshine Hospitals	2
	Total	278

Appendix I

S. No	Institute Name
1	College of Applied Medical Sciences, University of Hafr Al Batin, South Arabia
2	College of Natural and Computational Sciences, Addis Ababa University, Ethiopia
3	Division of Pharmacognosy, University of Vienna
4	Faculty of Pharmacy, Chiang Mai University, Chiang Ma, Thailand
5	Laboratory of Computational Modeling of Drugs, South Ural State University, Chelyabinsk, Russia
6	Lorestan University of Medical Sciences, Khorramabad, Iran
7	Medical University of Lublin, Chodźki 4a, 20-093 Lublin
8	Departamento de Produtos Naturais e Alimentos, Brazil
9	Academic Health System Faculty of Medicine Universitas Indonesia, Dr Cipto Mangunkusumo Hospital, Jakarta
10	Agriculture and Engineering, University of Zululand, South Africa
11	Lake Erie College of Osteopathic Medicine, Bradenton, Florida
12	Beckman Research Institute of City of Hope Comprehensive Cancer Center, Duarte
13	Beijing University of Traditional Chinese Medicine, Fangshan District
14	Bern University of Applied Sciences, Competence Center Participatory Health Care, Murtenstrasse
15	Center of Excellence in DNA Barcoding of Thai Medicinal Plants, Chulalongkorn University
16	Centre for Pharmacognosy and Phytotherapy, School of Pharmacy, University College London
17	Centre of Social and Psychological Sciences, Slovak Academy of Sciences, Slovak Republic
18	Chinese Academy of Medical Sciences and Peking Union Medical College, China
19	Food Science Program, One University Drive, Orange, USA
20	College of Ethnomedicine, Chengdu University of Traditional Chinese Medicine
21	College of Ethnomedicine, Chengdu University of Traditional Chinese Medicine, China
22	College of Natural Sciences, Arba Minch University, Ethiopia
23	College of Pharmacy, Chengdu University of Traditional Chinese Medicine, Chengdu
24	Sandwell and West Birmingham Hospitals NHS Trust, Birmingham, UK
25	San Francisco School of Medicine, Zuckerberg San Francisco General Hospital, University of California, USA
26	Danylo Halytsky Lviv National Medical University , Russia
27	Department of Biochemistry, Bahauddin Zakariya University, Multan
28	Department of Biochemistry, College of Science, King Saud University, Saudi Arabia
29	Department of Biochemistry, Faculty of Science, King Abdulaziz University, Saudi Arabia
30	Department of Biology, College of Science, Taif University, Saudi Arabia
31	Department of Chemistry, Batterjee Medical College, Jeddah, Saudi Arabia
32	Department of Chemistry, Faculty of Science, University of Dschang, Cameroon
33	Department of Chemistry, Jashore University of Science and Technology, Bangladesh
34	Department of Clinical Pharmacy and Therapeutics, Applied Science Private University, Amman, UAE
35	Department of Clinical Pharmacy, Dubai Health Authority, UAE
36	Department of Communication, Salisbury University, USA
37	Department of Emergency Medicine, UC San Diego Health, San Diego, USA
39	Department of Environmental Health Sciences, Morrill I, N344, University of Massachusetts, Amherst, USA
40	Department of Family Medicine, School of Medicine, University of California San Diego, USA
41	Department of Food Sciences, Faculty of Science and Technology, Universiti Kebangsaan Malaysia
42	Department of Forestry Science, Faculty of Agriculture Science and Forestry, Universiti Putra, Malaysia
43	Department of Herbal Pharmacology, College of Korean Medicine, Gachon University, Sujeong-gu, Seongnam, Republic of Korea
44	Department of Internal Medicine and Nature-Based Therapies, Immanuel Hospital Berlin
45	Department of Life Science, Yeungnam University, Gyeongsan, Korea
46	Department of Life Sciences, School of Pharmacy, International Medical University, Malaysia
47	Department of Life Sciences, Yeungnam University, Gyeongsan , Korea
48	Department of Medicine, Integrative Medicine Service, Memorial Sloan Kettering Cancer Center, New York

(*Contd.*)

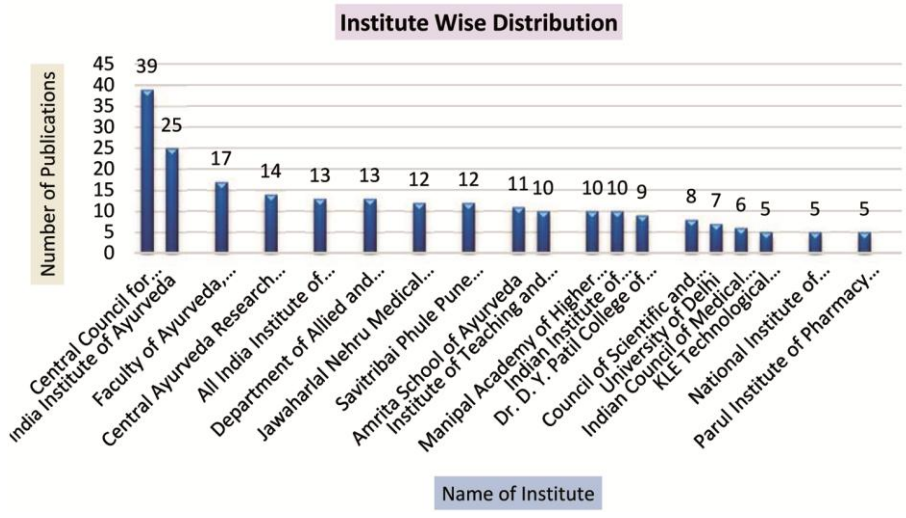
Appendix I (*Contd.*)

49	Department of Molecular Medicine and Byrd Alzheimer's Research Institute, Morsani College of Medicine, University of South Florida, Tampa
50	Department of Nursing; Faculty of Nursing, Physiotherapy and Podiatry, University of Seville
51	Department of Pediatrics, Gemeinschaftskrankenhaus Herdecke
52	Department of Periodontology, University Hospital Würzburg, Würzburg
53	Department of Pharmacy, University of Houston
54	Department of Physical Medicine and Rehabilitation, University of North Carolina
55	Department of Radiology, University of Missouri
56	Department of Veterinary Hygiene and Management, Faculty of Veterinary Medicine, Cairo University
57	Division of Epidemiology and Public Health, School of Medicine, University of Nottingham, Nottingham
58	Epidemiology and Health Economics, Charité—Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin and Humboldt-Universität zu Berlin
59	Facultad de Medicina, Universidad del Azuay, Equador
60	Faculty of Agro-Industry, Kasetsart University, Thailand
61	Faculty of Medicine, King Abdulaziz University, Jeddah,
62	Faculty of Medicine, University of Toronto; Environmental and Occupational Health
63	Faculty of Science and Technology, University of Canberra, Canberra
64	Faculty of Science, Ibn Tofail University
65	Faculty of Science, NCCR Chemical Biology, University of Geneva
66	Faculty of Science, University of Rajshahi
67	Faculty of Technology, University of Sri Jayewardenepura,
68	First Hospital of Hunan Traditional, Chinese Medical College, Zhuzhou
69	Food & Health Laboratory, Institute of Materials Science, University of Valencia
70	Georgetown University, Washington
71	Gomal University, Dera Ismail Khan , Pakistan
72	Hacettepe University, Medical oncology, Ankara
73	Hospital of Chengdu University of Traditional Chinese Medicine, Chengdu
74	Indigenous Bioresources Research Group, School of Natural Sciences, Macquarie University, Sydney
75	Institut de Chimie Organique et Analytique
76	Institute of Chemistry, University of Neuchâtel, Neuchâte
77	Institute of Chinese Materia Medica, China Academy of Chinese Medical Sciences
78	Institute of Chinese Materia Medica, Shanghai University of Traditional Chinese Medicine,
79	Institute of Indigenous Medicine, University of Colombo
80	Institute of Integrative Medicine, Witten-Herdecke University
81	Institute of Social Medicine, Epidemiology and Health Economics, Charité - Universitätsmedizin Berlin
82	Integrative Ayurveda Specialist, Ayu.Care Clinic, San Francisco Bay Area, California Association of Ayurvedic Medicine
83	Integrative Skin Science and Research, Sacramento, USA
84	Internal Medicine, Ascension Providence Hospital, Southfield, USA
85	Iwate Biotechnology Research Center, japan
86	Jamil–ur–Rahman Center for Genome Research, University of Karachi
87	K.A. CARE Energy Research and Innovation Center, King Fahd University of Petroleum & Minerals, Dhahran
88	Kunming Institute of Botany, Chinese Academy of Sciences, Kunming
89	Laboratório de Pesquisa em Produtos Naturais, Universidade Federal de Goiás
90	Laboratory of Molecular Biology, VA New Jersey Health Care System
91	Lithuanian University of Health Sciences, Sukileliu
92	London School of Hygiene and Tropical Medicine
93	Ministry of Education, Heilongjiang University of Chinese Medicine
94	Ministry of Health and Population, Kathmandu
95	Mohammed Bin Rashid University of Medicine and Health Sciences, UAE

(*Contd.*)

Appendix I (*Contd.*)

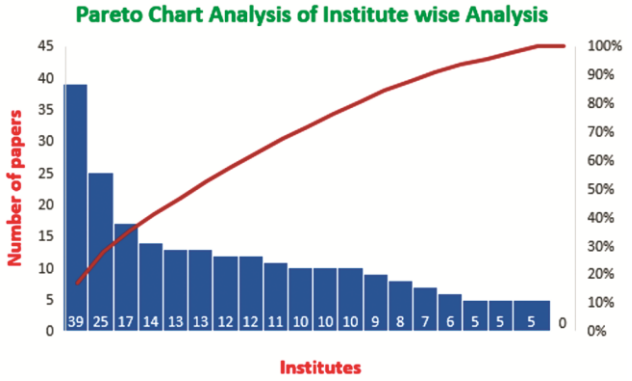
96	Mohammed V University of Rabat, UAE
97	National Nuclear Research Institute Ghana Atomic Energy Commission, Legon
98	Natural Products Division, Forest Research Institute Malaysia, Kepong, Selangor
99	Naturopathy Department, Dongbang Culture University,Korea
100	Nepal Engineering College, Affiliated to Pokhara University
101	Nepal Health Research Council, Kathmandu
102	Newcastle University, Newcastle upon Tyne, USA
103	NICM Health Research Institute, Western Sydney University,Australia
104	Institute of Integrative Medicine, Witten-Herdecke University
105	Environmental Biology, Wrocław University of Environmental and Life Sciences, Kożuchowsk
106	Osher Center for Integrative Health, University of California
107	Research Center for Biology, Indonesian Institute of Sciences
108	Robert Stempel College of Public Health & Social Work, Florida International University
109	Sabinsa Corporation, East Windsor
110	School of Food and Biological Engineering, Jiangsu University, Zhenjiang
111	School of Pharmaceutical Science, Hubei University of Medicine, Shiyan
112	School of Pharmacy, Ningxia Medical University, Yinchuan
113	Sechenov University · Institute of Biodesign and Modeling of Complex System.
114	Soonchunhyang University, Asan
115	South Eastern Sydney Public Health Unit
116	Sri Jayewardenepura University, Nugegoda, Sri Lanka.
117	St Jude Children's Research Hospital, Memphis
118	Technical University of Munich, Campus Straubing for Biotechnology and Sustainability, Straubing, Germany
119	Technische Universität Dresden, Zellescher Weg
120	The People's Hospital of Jiangmen, Southern Medical University
121	Universitas Padjadjaran, Jl. Singaperbangsa
122	University Clinical Centre of the Republic of Srpska
123	University Medical Center Goettingen, Georg-August University, Göttingen
124	University of Pretoria | UP · Department of Chemistry
125	University of Rochester Medical Center, Rochester
126	University of Texas McGovern Medical School
127	Wuhan Botanical Garden, Chinese Academy of Sciences, Wuhan
128	Yenepoya Ayurveda Medical College and Hospital, Naringana
129	Zhejiang A&F University, Hangzhou
130	zmir Institute of Technology, Gulbahçe Campus



Graph 3 — Institute-Wise Distribution of Articles

Table 3(a) — Institute Wise Distribution for Pareto Analysis

S. No	Number of Papers	Cumulative Number	Cumulative Percentage
1	39	39	16.883
2	25	64	27.70563
3.	17	81	35.06494
4.	14	95	41.12554
5.	13	108	46.75325
6	13	121	52.38095
7.	12	133	57.57576
8	12	145	62.77056
9	11	156	67.53247
10	10	166	71.86147
11	10	176	76.19048
12	10	186	80.51948
13	9	195	84.41558
14	8	203	87.87879
15	7	210	90.90909
16	6	216	93.50649
17	5	221	95.671
18	5	226	97.8355
19	5	231	100
Total		231	100



Graph 3(a) — Pareto Chart Analysis of Institute- wise publication

contribution of 141 papers. Many international journals like *Molecules, Journal of Complementary and Integrated Medicnes, Frontiers in Pharmacology* etc have published articles on Ayurveda. Table 4 shows the trend of publication in major journals (only journals having more than 3 publications are shown in the table). Table 4(a) and graph 4 shows the first 29 most important journals for Pareto chart analysis.

Highly Cited Papers

Highly cited papers are those papers that have received the maximum citations for their publication.

Table 4 — Journal wise Distribution of Articles

S. No	Journal Name	No. Of Publications
1	Journal of Ayurveda and Integrative Medicine	141
2	Journal of Drug Research in Ayurvedic Sciences	31
3.	Journal of Research in Ayurvedic Sciences	30
4.	Journal of Ethnopharmacology	26
5.	Journal of Natural Remedies	17
6	Aryavaidyan	15
7.	International Journal of Ayurveda Research	11
8	Frontiers in Pharmacology	10
9	Indian Journal of Traditional Knowledge	9
10	Cureus	9
11	Combinatorial chemistry & High throughput screening	8
12	Molecules	8
13	Indian Journal of Medical Ethics	7
14	Phytomedicine	5
15	Drug Metabolism	5
16	ACS Omega	4
17	Journal of Herbal Medicine	4
18	Natural Products Research	4
19	Pharmacognosy Magazine	4
20	Plant Science Today	4
21	South African Journal of Botany	4
22	Ayu	3
23	Critical Review Food Science Nutrition	3
24	Fitoterapia	3
25	Journal of Biomolecular Structural Design	3
26	Journal of Complementary Integrated Medicine	3
27	Journal of Ethnobiology and Ethno medicine	3
28	Journal of Integrated Complementary Medicine	3
29	Journal of Pharmacology and Pharmacotherapeutics	3

The paper by Priya shree *et al* from Banaras Hindu University which tops the chart of highly cited papers was published in 2022 has received 355 citations followed by paper by Sanjeev Rastogi *et al* in 2022 which has received 266 citations. The paper by *Weng & Goel* from Beckman Research Institute of City of Hope Comprehensive Cancer Center, Duarte, USA has received 249 citations till date. Table 5 lists the top 20 papers with maximum citations.

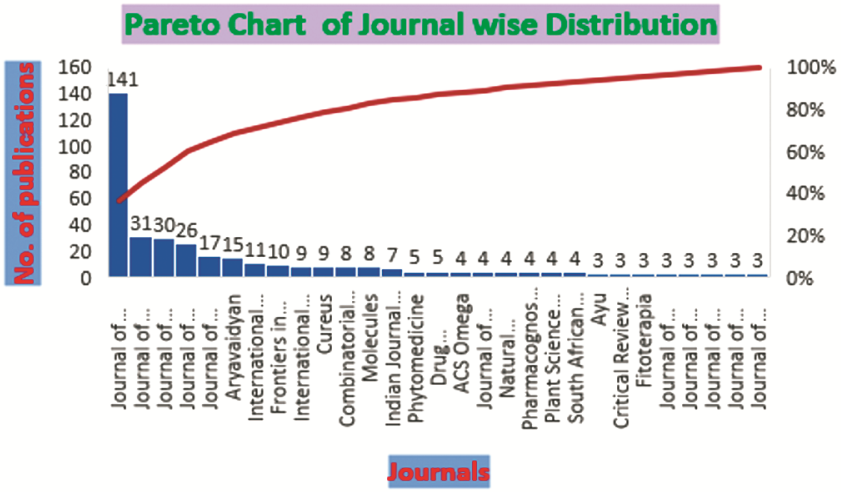
Findings

1 This is a pilot study to understand the trend of publication in the field of Ayurveda.

2 Many countries all over the world are contributing in the field of Ayurveda.

3 India has a large number of Ayurveda Institutes and Institutes like and All India Institute of Ayurveda have significant publications in this area.

4 There is a tendency of collaboration research compared to single authored publication and also the number of citations in average received by multi authored papers is more than that of single authored paper.



Graph 4 — Pareto Chart Analysis of Journals

Table 4 (a) — Journal Wise Distribution for Pareto Analysis

S. No	Number of Papers	Cumulative Number	Cumulative Percentage
1	141	141	37.10526
2	31	172	45.26316
3.	30	202	53.15789
4.	26	228	60
5.	17	245	64.47368
6	15	260	68.42105
7.	11	271	71.31579
8	10	281	73.94737
9	9	290	76.31579
10	9	299	78.68421
11	8	307	80.78947
12	8	315	82.89474
13	7	322	84.73684
14	5	327	86.05263
15	5	332	87.36842
16	4	336	88.42105
17	4	340	89.47368
18	4	344	90.52632
19	4	348	91.57895
20	4	352	92.63158
21	4	356	93.68421

(*Contd.*)

Table 4 (a) — Journal Wise Distribution for Pareto Analysis (*Contd.*)

S. No	Number of Papers	Cumulative Number	Cumulative Percentage
22	3	359	94.47368
23	3	362	95.26316
24	3	365	96.05263
25	3	368	96.84211
26	3	371	97.63158
27	3	374	98.42105
28	3	377	99.21053
29	3	380	100
Total	380	100	

Table 5 — Articles with highest citations (Top 20)

S. No	Title of the article	No. of Citations
1	Targeting COVID-19 (SARS-CoV-2) main protease through active phytochemicals of ayurvedic medicinal plants - Withania somnifera (Ashwagandha), Tinospora cordifolia (Giloy) and Ocimum sanctum (Tulsi) - a molecular docking study	355
2.	COVID-19 pandemic: A pragmatic plan for ayurveda intervention	266
3.	Curcumin and colorectal cancer: An update and current perspective on this natural medicine	249
4.	Ethnodermatological use of medicinal plants in India: From ayurvedic formulations to clinical perspectives - A review	152
5.	Immunity against COVID-19: Potential role of Ayush Kwath	142
6	Ayurvedic treatment of COVID-19: A case report	111
7.	Nutmeg (Myristica fragrans Houtt.) essential oil: A review on its composition, biological, and pharmacological activities	107
8.	Medicinal Plants Used for Abdominal Discomfort - Information from Cancer Patients and Medical Students	106
9	Evaluation of traditional ayurvedic Kadha for prevention and management of the novel Coronavirus (SARS-CoV-2) using in silico approach	97
10	Therapeutic importance of Cucurbitaceae: A medicinally important family	96
11	AYUSH 64, a polyherbal Ayurvedic formulation in Influenza-like illness - Results of a pilot study	77
12	Network pharmacology of AYUSH recommended immune-boosting medicinal plants against COVID-19	69
13	Identification of bioactive molecules from Triphala (Ayurvedic herbal formulation) as potential inhibitors of SARS-CoV-2 main protease (Mpro) through computational investigations	67
14	Curcumin and Weight Loss: Does It Work?	66
15	In silico evaluation of the compounds of the ayurvedic drug, AYUSH-64, for the action against the SARS-CoV-2 main protease	61
16	Guava (Psidium guajava L.): a glorious plant with cancer preventive and therapeutic potential	59
17	Ethnomedicinal study of medicinal plants used by Mizo tribes in Champhai district of Mizoram, India	57
18	Tinospora cordifolia (Willd.) Miers: Protection mechanisms and strategies against oxidative stress-related diseases	56
19	Panchgavya: A precious gift to humankind	56
20	Bamboo leaf: A review of traditional medicinal property, phytochemistry, pharmacology, and purification technology	53

5 Ayurveda articles receive high citations showing a keen interest of researchers in this field.

6 There are a huge contribution of international institutes and authors showing research on Ayurveda is not just restricted to India alone.

Conclusions

The study highlights the importance of Ayurveda research and the high number of publications and the citations received reflects the growing interests and advancements in this field. The huge contributions from different Institutions highlight the importance of Ayurveda research. However, there are very few publications by Indians in international journals, most of the researchers are publishing in local journals which will not reflect the potency of our research worldwide. It was observed that maximum papers were published in 2022 showing a positive interest in Ayurvedic herbs during covid-19 pandemic. Increase

in funding and initiation of more projects by Government of India may lead to a brighter future for Ayurveda research.

References

1 Jaiswal, Yogini S.; Williams, Leonard L. A glimpse of Ayurveda-The forgotten history and principles of Indian traditional medicine. *Journal of Traditional and Complementary Medicine*, 2017, 7, 50-53.

2 Nedungadi, Prema et al. Ayurveda Research: Emerging trends and mapping to sustainable development goals. *Journal of Ayurveda and Integrative Medicine*, 2023, 14 (6). Doi.org/10.1016/j.jaim.2023.100809.

3 Maruelraj, Peter; Mahamed, Idhris & Spurgeon, Anand Raj. Visualizing the citation analysis of scholarly communication of Ayurveda Research during 1923-2018: An Exploratory Study. *International Journal of Arts, Science and Humanities*, 2020, 8 (1). Doi.org/10.34293/ sijash.vsil.3163.

4 Singh, Mukhtiar & Hasan, Nabi. World scholarly publications in Ayurveda: A quantitative analysis of 2001-2010. *International Journal of Digital Library Services*, 2013, 3(4).

5 Gupta, BM & Ahmed, KK Mueen. Research on Witharia Somnifera (Ashwaganda): A scientometric assessment of global publication output during 1995-2018. International Journal of Pharmaceutical Investigation, 2019, 9(2), 59-66. Doi/10.5330/jpi.2019.2.12

6 Rahman, Md Safiqur; Ansari, Khadeeja MN; Tewari, Lalit & Shah, Karnika. Quantitative and qualitative methods in libraries. 2021, 10(4), 505-530.

7 Kumar, Satish & Rajput, PS. Phyllanthus emblica (Medicinal plant) research: A scientometric analysis 2011-2021. *Library progress international*. 2022, 42 (2), 448-465.

8 Gupta, BM; Ahmed, Mueen KK &Gupta, Ritu. Glycyrrhiza glabra (Medicinal plant) research: A scientometric assessment of global publications output during 1997-2016. *Pharmacognosy Journal*, 2018, 10(6), 1067-1075.

9 Kumar, Ashutosh & Pandey Aseesh. A bibliometric analysis of 100 years of research on Himalayan cedar: Research trends, gaps and future implication. *Frontiers of Global Change*, 2024, 7. https://doi.org/10.3389/ ftgc20241.485083

10 Thrigulla, Saketh Ram. Clinical studies in Ayurveda: A bibliometric analysis of articles indexed in AYUSH research portal. *International Quarterly Journal of Research in Ayurveda*. 2022, 43(3), 75-81. 10.4103/ayu.ayu_144_21.

11 Priya Shree, Mishra Priyanka, Garg, Neha Tripathi, Yamini Bhusan Chandrabose, Selvaraj, Singh, Sanjeev Kumar. Targeting COVID-19 (SARS-CoV-2) main protease through active phytochemicals of ayurvedic medicinal plants - Withania somnifera (Ashwagandha), Tinospora cordifolia (Giloy) and Ocimum sanctum (Tulsi) - a molecular docking study. Journal of Biomolecular Structure and Dynamics. 2022.

12 Rastogi, Sanjeev; Narayan Pandey, Deep & Singh, Ram Harsh. COVID-19 pandemic: A pragmatic plan for ayurveda intervention. Journal of Ayurveda and Integrative medicine. 2022.

13 Weng W, Goel A. Curcumin and colorectal cancer: An update and current perspective on this natural medicin. Semin Cancer Biology. 2022.