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A Scientometric Mapping of Highly Cited Works on Medicinal Plants.

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A Scientometric Mapping of Highly Cited Works on Medicinal Plants

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Abstract

This article is written to analyze the articles published in Web of science in the context of the keyword “Medicinal plants”. Using the key word “Medicinal plants” a search was made in the Web of Science database to find the articles which are cited more than 100 times by the authors during the year 1989-2021. From the result of the search it is found that 1387 articles were cited more than 100 times. The main aim of this paper is to help the researchers, in the domain of Medicinal plants, to identify the mostly cited journal, most productive and cited countries, most cited articles, and most cited authors etc. to enable them to further continue their research.

Keywords: Scientometrics, Bibliometrics, Medicinal Plant, Highly Cited, Citation Analysis

Introduction

Citing or documenting the sources utilized in your analysis serves different purposes: It offers correct credit to the authors of the words or concepts that you simply incorporated into your paper. It permits those that are reading your work to find your sources, so as to find out additional concerning the ideas that you embrace in your paper.

Medicinal plants, additionally referred to as medicinal herbs, had been observed and utilized in conventional medicinal drug practices due to the fact that prehistoric time. Plants synthesise masses of chemicals for capabilities inclusive of defence in opposition to insects, fungi, diseases, and herbivorous mammals.

Objectives

- To identify the highly cited Articles.
- To identify the most productive and cited Countries.
- To identify the country wise Research collaboration.

- To identify the most productive and cited Institution
- To identify the most productive journal and authors.

Methodology

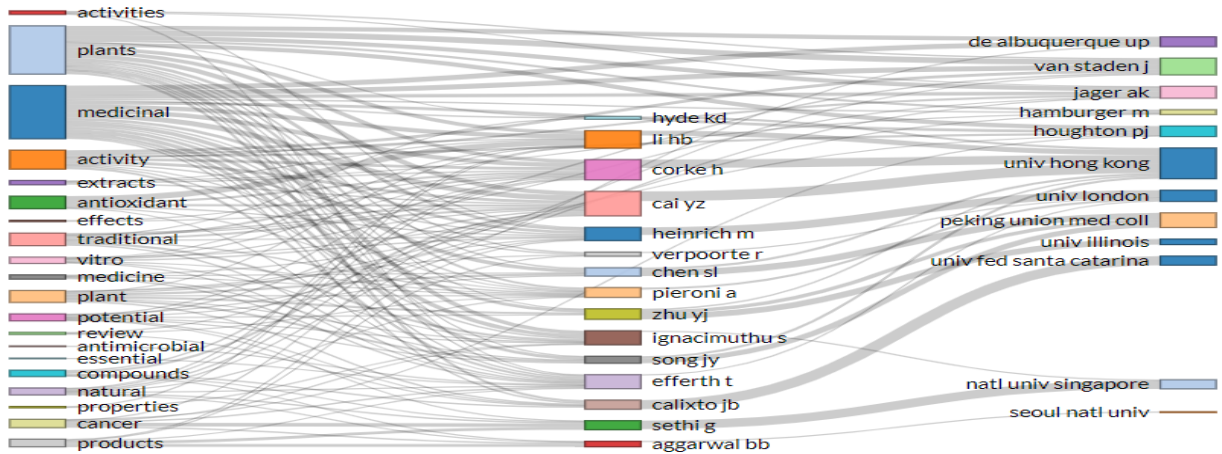
The publication data on Medicinal Plants has been retrieved by using Web of Science database during the year 1989 -2021. Using the key word “Medicinal plants” a search was made in the Web of Science database to find the articles which are cited more than 100 times by the authors during the year 1989-2021. A total of 25299 articles contain the keyword “Medicinal plants”, published in the period of 1989-2021 and the resultant articles were displayed. From the result of the search it is found that 1387 articles were cited more than 100 times. Among these the 1387 articles were listed, when the filter “More than 100 citation”, was applied to the below result.

Highly cited papers

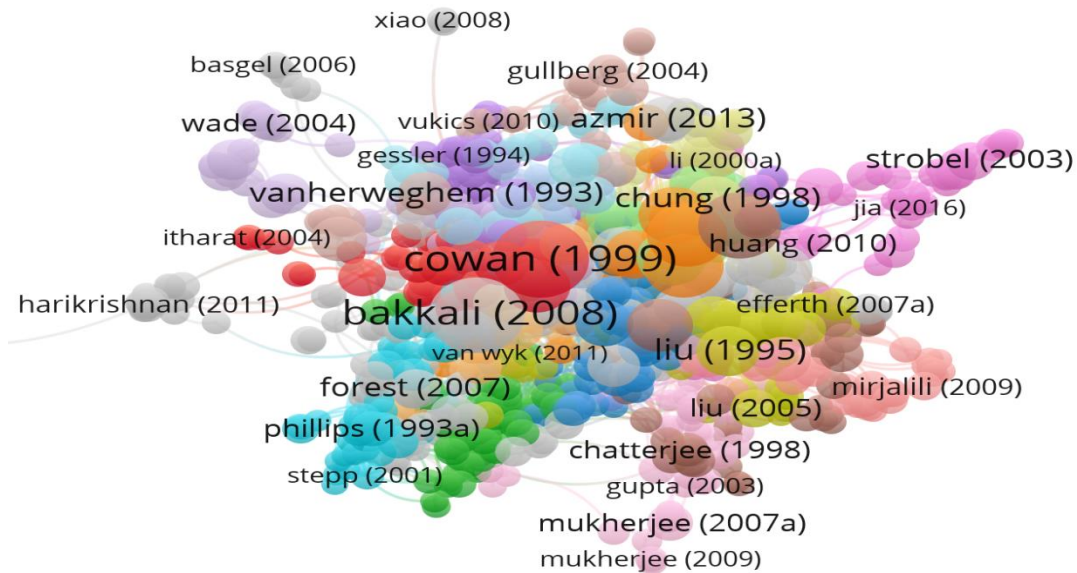
This table shows that out of 1387 articles, 15 articles received more than 1000 citations in the field of Medicinal Plants in Global level. The article on Plant products as antimicrobial agents has received 3882 citations in Global level followed by the article Biological effects of essential oils - A review received 3689 citations at the global level. This citation shows the impact of the articles in the field of medicinal plants

S.No	Date / Author / Journal	GCS	CR
1	153 Cowan MM, Plant products as antimicrobial agents, CLINICAL MICROBIOLOGY REVIEWS. 1999 OCT; 12 (4): 564-+	3882	253
2	820 Bakkali F, Averbeck S, Averbeck D, Waoum M Biological effects of essential oils - A review FOOD AND CHEMICAL TOXICOLOGY. 2008 FEB; 46 (2): 446-475	3689	326
3	230 Harborne JB, Williams CA Advances in flavonoid research since 1992 PHYTOCHEMISTRY. 2000 NOV; 55 (6): 481-504	2502	186
4	127 Ternes TA, Occurrence of drugs in German seaweed treatment plants and rivers WATER RESEARCH. 1998 NOV; 32 (11): 3245-3260	2499	39
5	123 Velioglu YS, Mazza G, Gao L, Oomah BD Antioxidant activity and total phenolics in selected fruits, vegetables, and grain products JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY. 1998 OCT; 46 (10): 4113-4117	2221	35
6	155 Kahkonen MP, Hopia AI, Vuorela HJ, Rauha JP, Pihlaja K, et al., Antioxidant activity of plant extracts containing phenolic compounds JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY. 1999 OCT; 47 (10): 3954-3962	2185	63
7	468 Cai YZ, Luo Q, Sun M, Corke H, Antioxidant activity and phenolic compounds of 112	1559	60

	traditionalChinesemedicinalplantsassociated with anticancer, LIFE SCIENCES. 2004 MAR 12; 74 (17): 2157-2184		
8	284Zheng W, Wang SY, Antioxidantactivity and phenoliccompounds in selectedherbs JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY. 2001 NOV; 49 (11): 5165-5170	1466	31
9	1236Cragg GM, Newman DJ, Naturalproducts: A continuingsource of noveldrugleads, BIOCHIMICA ET BIOPHYSICA ACTA-GENERAL SUBJECTS. 2013 JUN; 1830 (6): 3670-3695	1351	253
10	10SCALBERT A ANTIMICROBIALPROPERTIES OF TANNINS PHYTOCHEMISTRY. 1991; 30 (12): 3875-3883	1270	138
11	11AMMON HPT, WAHL MA, PHARMACOLOGY OF CURCUMA-LONGA, PLANTA MEDICA. 1991 FEB; 57 (1): 1-7	1249	59
12	913Vlot AC, Dempsey DA, Klessig DF SalicylicAcid, a MultifacetedHormone to CombatDisease, ANNUAL REVIEW OF PHYTOPATHOLOGY. 2009; 47: 177-206	1237	237
13	277Surh YJ, Chun KS, Cha HH, Han SS, Keum YS, et al., Molecularmechanismsunderlyingchemopreventiveactivities of anti-inflammatoryphytochemicals: down-regulation of COX-2 and iNOS through suppression of NF-kappa B activation MUTATION RESEARCH-FUNDAMENTAL AND MOLECULAR MECHANISMS OF MUTAGENESIS. 2001 SEP 1; 480: 243-268	1183	301
14	61Liu J, Pharmacology of oleanolicacid and ursolicacid, JOURNAL OF ETHNOPHARMACOLOGY. 1995 DEC 1; 49 (2): 57-68	1136	91
15	473Miliauskas G, Venskutonis PR, van Beek TA Screening of radicalscavengingactivity of some medicinal and aromaticplantextracts FOOD CHEMISTRY. 2004 APR; 85 (2): 231-237	1054	27



Document	Citations	Links
cowan (1999)	3882	54
tetik (2013)	117	34
cai (2004)	1559	30
krishnaiah (2011)	195	30
cakilcioglu (2011)	156	28
heinrich (1998a)	461	27
heinrich (2009b)	117	26
polat (2013)	108	26
pieron (2005a)	139	25
bakkali (2008)	3689	24
cakilcioglu (2010)	163	24
ayyanar (2011)	105	24
rios (2005)	821	23
gurdal (2013)	107	21
de albuquerque (2007a)	343	20
muthu (2006)	272	20
heinrich (2009a)	192	20
van vuuren (2008)	157	19
kahkonen (1999)	2185	18
saldanha gazzaneo (2005)	201	18
cartaxo (2010)	136	18



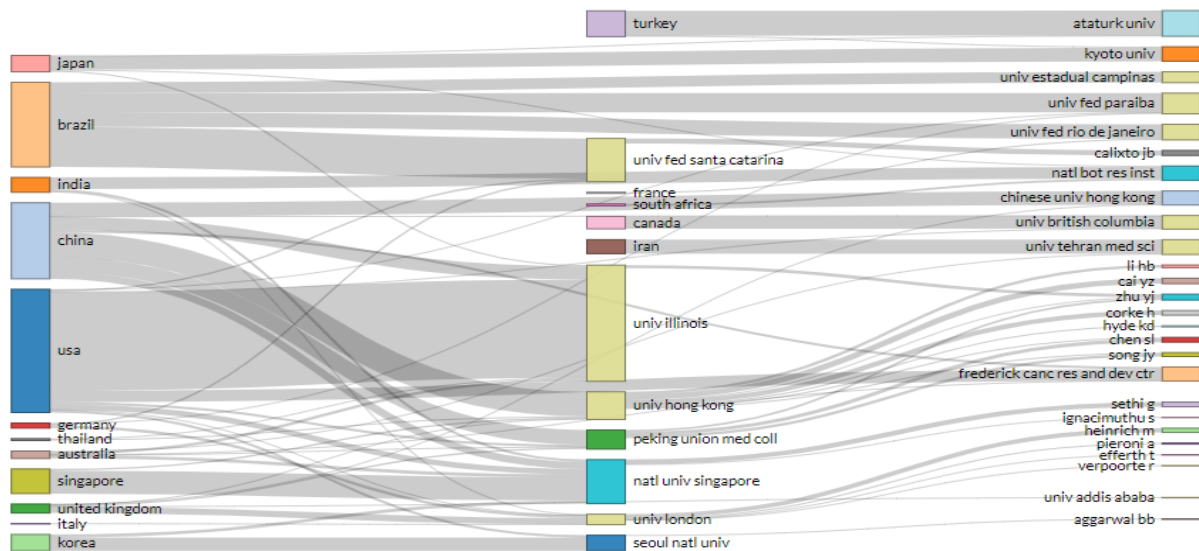
Most Productive and Cited Countries

This table states the list of countries, in the order highest to lowest that has produced articles which have received more than 100 citations. From the table it can be observed that USA has published 229 articles with 53,813 citations. India ranked second with 33,974 citations for the 187 papers written by the authors contributing to 13.5% of the total citation. China has produced 148 papers with 28,815 citations amounting to 10.7% of the overall citation. A total of 99 countries have received citation with more than 100.

Out of the total countries, the 10 countries in the top of the group have received more than 10,000 citations. The other group of 18 countries have more than 5,000 citations, The next groups of 46 countries have received more than 1000 citations and the last group of 60 countries have citation value of more than 500. Overall 99 countries have received more than 100 citations.

#	Country	Records	%	Citations	Country	Records	%	Citations
1	USA	229	16.5	53813	Tunisia	6	0.4	894
2	India	187	13.5	33976	New Zealand	4	0.3	854
3	China	148	10.7	28815	Oman	2	0.1	851
4	UK	102	7.4	23037	Tanzania	7	0.5	801
5	Brazil	94	6.8	18150	Yemen	4	0.3	801
6	Germany	73	5.3	16236	Croatia	2	0.1	769
7	Japan	65	4.7	11791	Lebanon	4	0.3	753
8	South Korea	58	4.2	11145	Hungary	5	0.4	679
9	Italy	62	4.5	10493	Vietnam	2	0.1	653
10	France	33	2.4	10206	Venezuela	1	0.1	623
11	Unknown	30	2.2	8339	Cameroon	3	0.2	490
12	Australia	46	3.3	8298	Costa Rica	3	0.2	481
13	South Africa	45	3.2	8142	Bangladesh	3	0.2	478
14	Canada	33	2.4	7868	Sri Lanka	4	0.3	462
15	Spain	37	2.7	7350	Chile	2	0.1	443
16	Turkey	44	3.2	6864	Slovakia	4	0.3	441
17	Morocco	12	0.9	5622	Kuwait	3	0.2	435
18	Iran	36	2.6	5370	Jamaica	1	0.1	393
19	Netherlands	24	1.7	4547	Cote Ivoire	3	0.2	388
20	Singapore	25	1.8	4336	Philippines	2	0.1	379
21	Finland	11	0.8	4308	Iceland	1	0.1	363
22	Thailand	28	2	4222	Cyprus	2	0.1	332
23	Belgium	17	1.2	4064	Kenya	2	0.1	289
24	Pakistan	21	1.5	4062	Uganda	2	0.1	282
25	Switzerland	18	1.3	3841	Bolivia	2	0.1	241
26	Malaysia	19	1.4	3456	Bosnia & Herceg	2	0.1	241
27	Saudi Arabia	17	1.2	3179	Peru	2	0.1	234
28	Nigeria	14	1	2866	Mauritius	2	0.1	220

29	Portugal	14	1	2766	Russia	2	0.1	216
30	Mexico	16	1.2	2694	Uruguay	1	0.1	199
31	Israel	15	1.1	2516	PANAMA	1	0.1	179
32	Austria	10	0.7	2252	Slovenia	1	0.1	169
33	Sweden	11	0.8	2241	Libya	1	0.1	146
34	Egypt	14	1	2107	MALAWI	1	0.1	143
35	Denmark	11	0.8	2070	Ecuador	1	0.1	140
36	Taiwan	12	0.9	2023	Guinea	1	0.1	137
37	Poland	13	0.9	1926	Ghana	1	0.1	131
38	Czech Republic	12	0.9	1740	Belize	1	0.1	126
39	Argentina	8	0.6	1676	GUATEMALA	1	0.1	124
40	Ethiopia	11	0.8	1641	Nepal	1	0.1	121
41	Norway	9	0.6	1533	Luxembourg	1	0.1	119
42	Algeria	5	0.4	1445	Syria	1	0.1	117
43	Indonesia	7	0.5	1386	Mongolia	1	0.1	111
44	Serbia	8	0.6	1147	Qatar	1	0.1	105
45	U Arab Emirates	3	0.2	1095	Burkina Faso	1	0.1	104
46	Lithuania	1	0.1	1054	Ireland	1	0.1	103
47	DEM REP CONGO	5	0.4	984	Cuba	1	0.1	102
48	Greece	5	0.4	940	Montenegro	1	0.1	101
49	Bulgaria	5	0.4	919	Zimbabwe	1	0.1	100
50	Jordan	7	0.5	915				



Three Fields Plot (Country, Institutions and Authors)

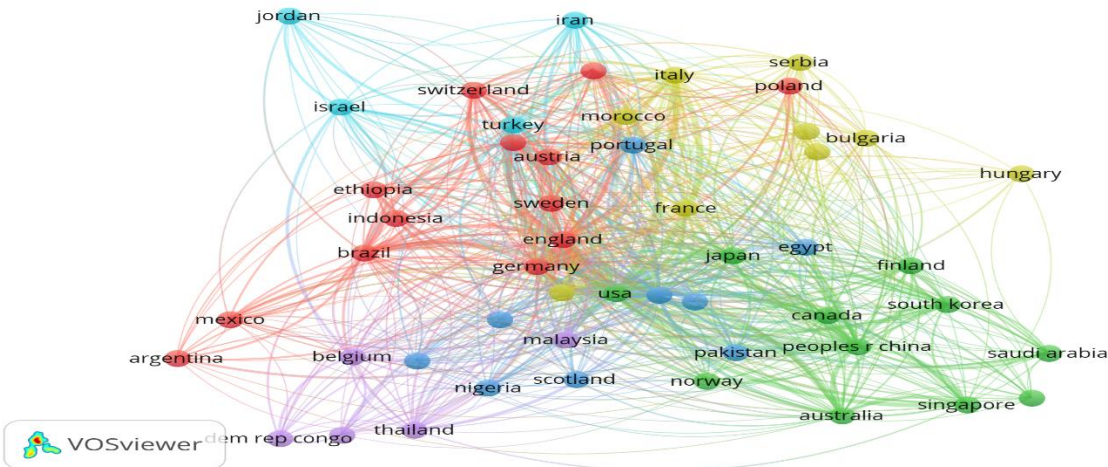
Research Collaboration

Access to global systems for scientists and researchers to store, proportion and examine research (eg COVID) information is important. By operating together, they could enhance trying out and treatment. They also can proportion their know-how to expand a vaccine.

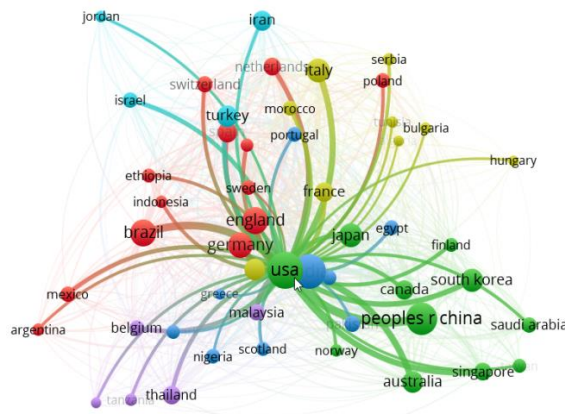
In the collaborative research, USA and China together have published 21 papers and ranked in the 1st position. China and UK is placed in the second position with 14 records, followed by USA and India with a total of 14 publication

From	To	Frequency
Usa	China	21
China	United Kingdom	14
Usa	India	14
Usa	United Kingdom	14
Usa	Australia	11
Usa	Korea	11
United Kingdom	Netherlands	8
Usa	Germany	8
China	Singapore	7
Germany	Switzerland	7
United Kingdom	Germany	7
United Kingdom	Italy	7
India	Korea	6
India	United Kingdom	6
Usa	Netherlands	6
Belgium	Congo	5
China	Australia	5
China	Thailand	5
Usa	Singapore	5
Australia	Singapore	4
Brazil	Germany	4
China	Japan	4
Germany	Australia	4
Italy	Netherlands	4
Japan	Thailand	4
Japan	Turkey	4
Spain	Portugal	4
United Kingdom	Australia	4
United Kingdom	South Africa	4
Usa	Italy	4
Usa	South Africa	4

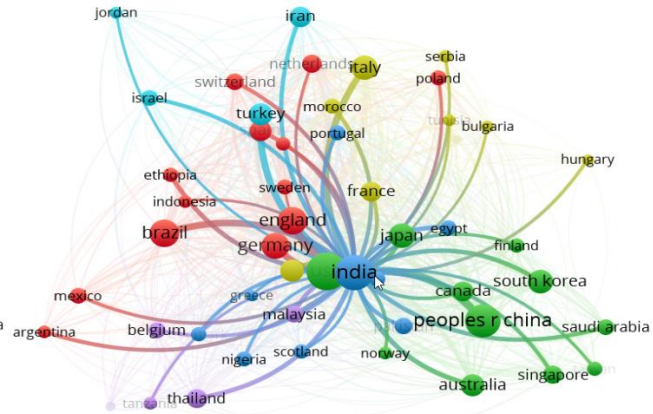
Brazil	Switzerland	3
China	Germany	3
China	India	3
China	Korea	3
France	Morocco	3
France	Tunisia	3
Germany	Yemen	3
India	Denmark	3
India	Japan	3
India	Singapore	3
Italy	Spain	3
Korea	Japan	3
Turkey	Greece	3
Usa	Brazil	3
Usa	Canada	3
Usa	France	3
Belgium	Finland	2
Belgium	Israel	2
Brazil	Costa Rica	2



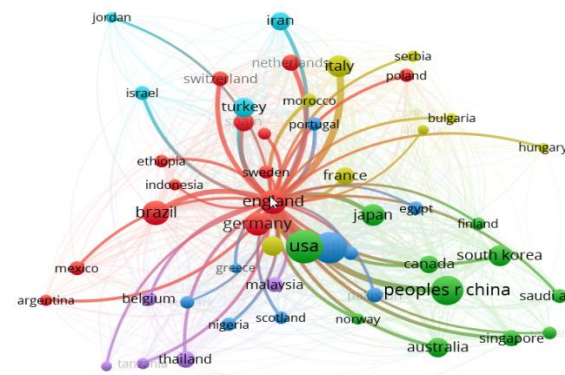
Citation Network of Countries



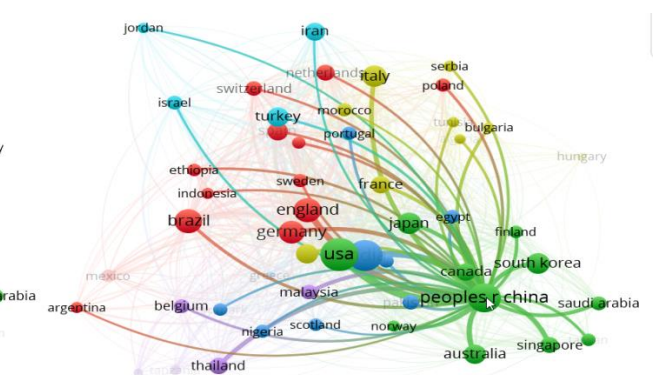
Citation Network of USA



Citation Network of India



Citation Network of England



Citation Network of China

Corresponding Country Collaboration.

The below table shows that there are two types of articles: single country publications (SCP) in which all authors belong to the same country and such publications represent intra-country collaboration; and multiple country publications (MCP) in which authors belong to different countries and such publications represent inter-country collaboration i.e. international collaboration.

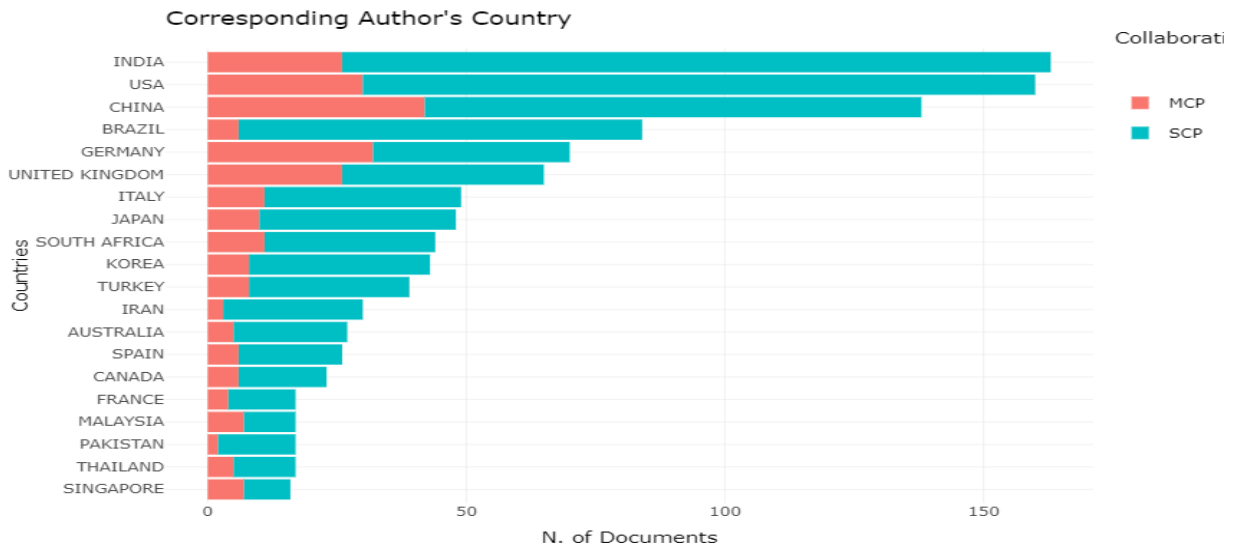
The table shows clearly the Indian authors have produced more number of articles with a number 163. Out of 163 articles 137 articles are published by Indian authors alone. Only 26 articles are collaborated with other countries.

If we look at the corresponding author wise rank list, the table clearly identifies India is in the 1st position with 163 articles, USA in second place with 160 articles, followed by China with 138 articles finishing 3rd place in the table.

Country	Articles	Freq	Single Country Publication (SCP)	Multiple Country Publication (MCP)	MCP_Ratio
India	163	0.121461	137	26	0.1595

Usa	160	0.119225	130	30	0.1875
China	138	0.102832	96	42	0.3043
Brazil	84	0.062593	78	6	0.0714
Germany	70	0.052161	38	32	0.4571
United Kingdom	65	0.048435	39	26	0.4
Italy	49	0.036513	38	11	0.2245
Japan	48	0.035768	38	10	0.2083
South Africa	44	0.032787	33	11	0.25
Korea	43	0.032042	35	8	0.186
Turkey	39	0.029061	31	8	0.2051
Iran	30	0.022355	27	3	0.1
Australia	27	0.020119	22	5	0.1852
Spain	26	0.019374	20	6	0.2308
Canada	23	0.017139	17	6	0.2609
France	17	0.012668	13	4	0.2353
Malaysia	17	0.012668	10	7	0.4118
Pakistan	17	0.012668	15	2	0.1176
Thailand	17	0.012668	12	5	0.2941
Singapore	16	0.011923	9	7	0.4375
Belgium	13	0.009687	4	9	0.6923
Israel	13	0.009687	10	3	0.2308
Mexico	13	0.009687	9	4	0.3077
Netherlands	12	0.008942	7	5	0.4167
Portugal	12	0.008942	8	4	0.3333
Czech Republic	11	0.008197	9	2	0.1818
Poland	11	0.008197	7	4	0.3636
Switzerland	11	0.008197	10	1	0.0909
Nigeria	10	0.007452	9	1	0.1
Austria	9	0.006706	8	1	0.1111
Morocco	9	0.006706	8	1	0.1111
Norway	9	0.006706	5	4	0.4444
Egypt	8	0.005961	6	2	0.25
Ethiopia	8	0.005961	6	2	0.25
Finland	8	0.005961	7	1	0.125
Jordan	7	0.005216	6	1	0.1429
Argentina	6	0.004471	6	0	0
Serbia	6	0.004471	4	2	0.3333
Hungary	5	0.003726	2	3	0.6
Sweden	5	0.003726	3	2	0.4
Tunisia	5	0.003726	2	3	0.6

Algeria	4	0.002981	2	2	0.5
Bulgaria	4	0.002981	2	2	0.5
Denmark	4	0.002981	2	2	0.5
Kuwait	3	0.002235	2	1	0.3333
Lebanon	3	0.002235	1	2	0.6667
Saudi Arabia	3	0.002235	3	0	0
Bosnia	2	0.00149	0	2	1
Cameroon	2	0.00149	2	0	0
Congo	2	0.00149	0	2	1



Most Productive and Cited Institutions (1528)

A total of 1528 institutions have been identified as the most productive and cited institutions with their contribution of papers.

The 32 article of the China Academy of Science have received 5199 citations for their papers. The University of Hongkong is in the second place with 21 articles and 7472 citations for their contribution. The 17 articles of the University of Singapore have received 2770 citation and placed 3rd in the list

#	Institution	Country	Records	%	Citations
1	Chinese AcadSci		32	2.3	5199
2	Univ Hong Kong		21	1.5	7472
3	Natl Univ Singapore		17	1.2	2770
4	Univ Fed Santa Catarina		15	1.1	2972
5	Kyoto Univ		14	1.0	2499

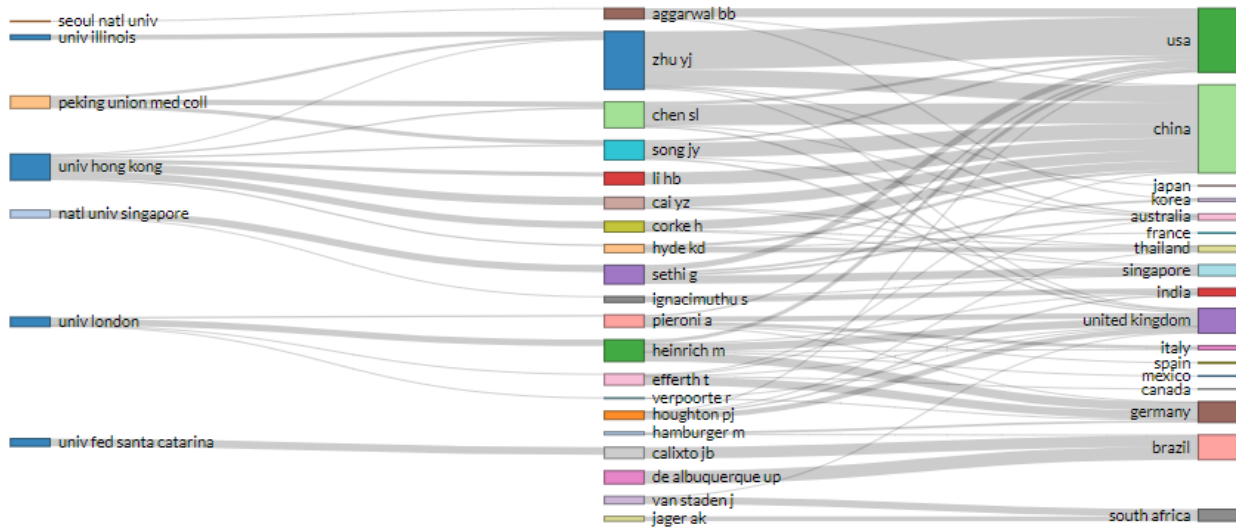
6	Seoul Natl Univ		14	1.0	3719
7	Univ Illinois		14	1.0	3952
8	Univ London		14	1.0	2144
9	Chinese Acad Med Sci		12	0.9	2066
10	Chinese Univ Hong Kong		11	0.8	1553
11	Royal Bot Gardens		11	0.8	3667
12	NCI		10	0.7	1681
13	Purdue Univ		10	0.7	1761
14	Univ Fed Paraiba		10	0.7	1804
15	Leiden Univ		9	0.6	1343
16	Univ Addis Ababa		9	0.6	1234
17	Univ Sao Paulo		9	0.6	2173
18	UnivWageningen& Res Ctr		9	0.6	2256
19	Banaras Hindu Univ		8	0.6	1205
20	China Acad Chinese Med Sci		8	0.6	1154
21	Hong Kong Baptist Univ		8	0.6	1717
22	King Saud Univ		8	0.6	1711
23	Kings Coll London		8	0.6	2308
24	Loyola Coll		8	0.6	1141
25	Natl Bot Res Inst		8	0.6	1419
26	Peking Union Med Coll		8	0.6	1846
27	Univ Bradford		8	0.6	1208
28	Univ British Columbia		8	0.6	1358
29	UnivEstadual Campinas		8	0.6	1645
30	Univ Fed Rio de Janeiro		8	0.6	1237

Citation Impact

If we filter the institutions with citation of at least 25 per paper published by the authors of the respective institution, the following results are noted, A total of 105 institution have received 1000 or more citations, a total of 292 institution have received 500 or more citation and other 370 institution have received 400 or more citation for their contribution.

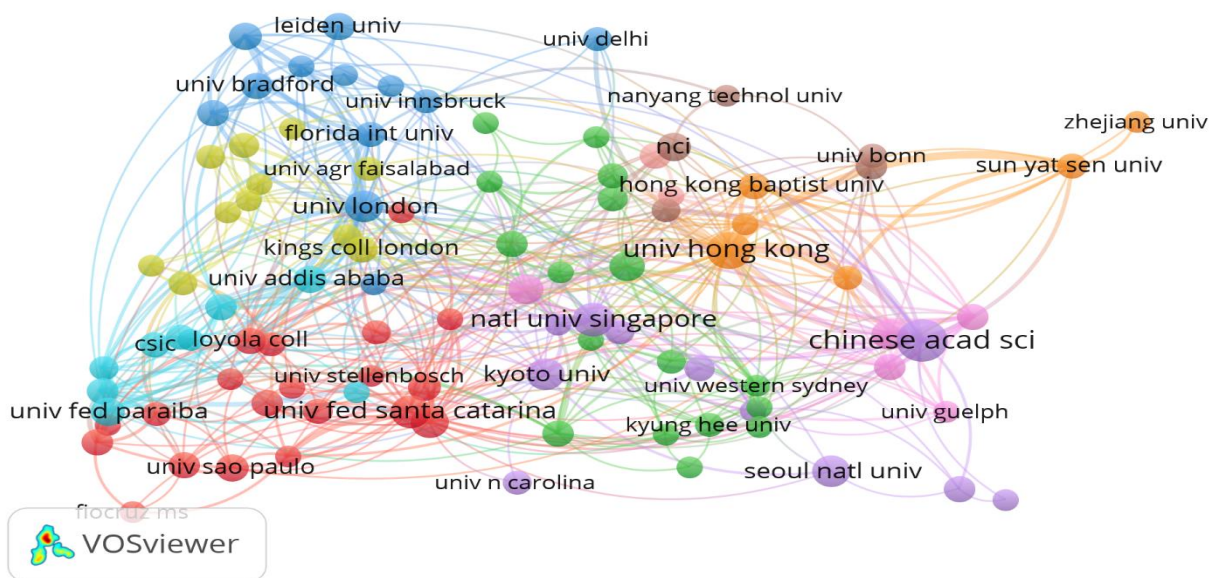
#	Institution	Records	%	Citations
1	Univ Hong Kong	21	1.5	7472
2	Chinese AcadSci	32	2.3	5199
3	Univ Illinois	14	1.0	3952
4	Miami Univ	1	0.1	3882
5	Seoul Natl Univ	14	1.0	3719
6	CtrUniv	1	0.1	3689
7	UnivAbdelmalekEssaadi	1	0.1	3689
8	Royal Bot Gardens	11	0.8	3667

9	Univ Reading	5	0.4	3214
10	Univ Helsinki	5	0.4	3125



Three Fields Plot (Institutions, Authors, and Country)

Organization	Documents	Citations	Total link strength
univ hong kong	21	7472	118
univ london	14	2144	79
chinese acad sci	31	5013	69
univ fed rural pernambuco	8	1283	57
chinese acad med sci	12	2066	56
royal bot gardens	11	3667	56
peking union med coll	8	1846	48
florida int univ	7	1103	42
univ illinois	13	3766	41
univ fed pernambuco	6	742	40
natl univ singapore	17	2770	37
sun yat sen univ	7	1440	37
univ bradford	8	1208	37
china acad chinese med sci	8	1154	36
univ freiburg	8	1970	35
hong kong baptist univ	8	1717	34
univ wageningen & res ctr	9	2256	33
loyola coll	8	1141	31
univ fed paraiba	10	1804	30
univ fed santa catarina	15	2972	30



Network of Institutions

Document types

As mentioned in the table there are different category of articles list. Out of 1387 highly cited publications listed in the table in the field of Medicinal plants, 862 publications are article, 482 are Review articles with citations 113918, followed by 28 conference proceeding articles with 6358 citations and there are 7 numbers of Editorial materials , 5 numbers of Book Review Articles , 2 numbers of Letters and 1 is of type note

#	Document Type	Records	%	Citations
1	Article	862	62.1	156528
2	Review	482	34.8	113918
3	Article; Proceedings Paper	28	2.0	6358
4	Editorial Material	7	0.5	1438
5	Review; Book Chapter	5	0.4	2005
6	Letter	2	0.1	248
7	Note	1	0.1	141

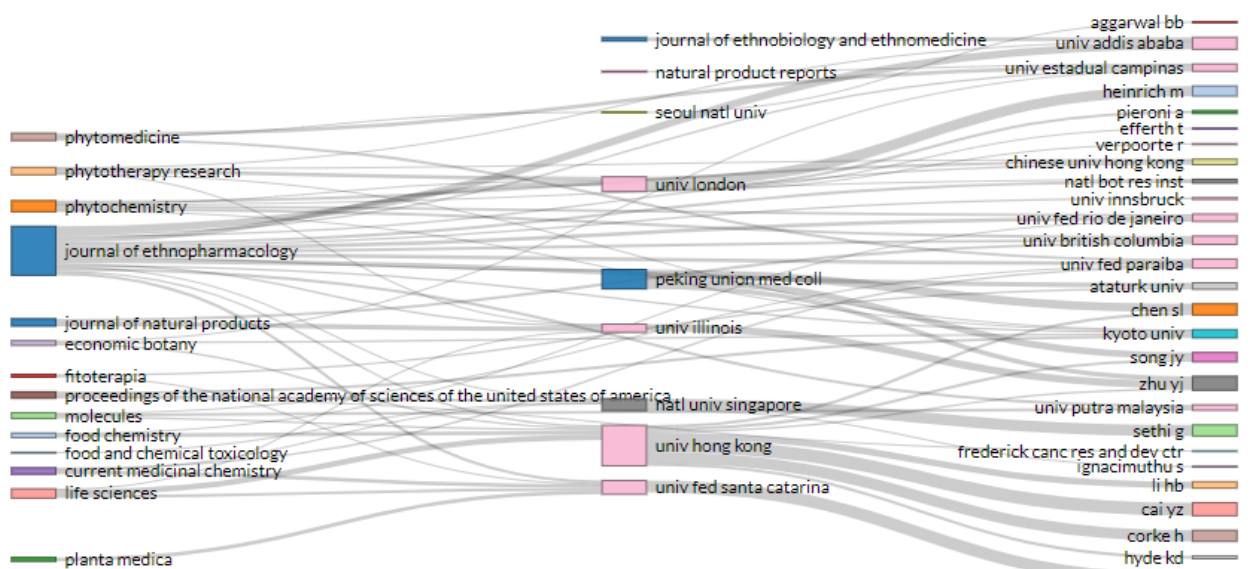
Most productive Journals (441)

A total of 441 Journals are identified as the most productive and cited journals in the field of Medicinal plants. Journal of Ethno pharmacology has published 290 articles with 50751 citations at the global level

Food chemistry has published 36 articles with 8478 citations, and is in the second postion. In the third position is the Phytochemistry with 32 publications and 10281 citations. 20 Journals have published more than 10 articles in the field of Medicinal plants. These journals received citations

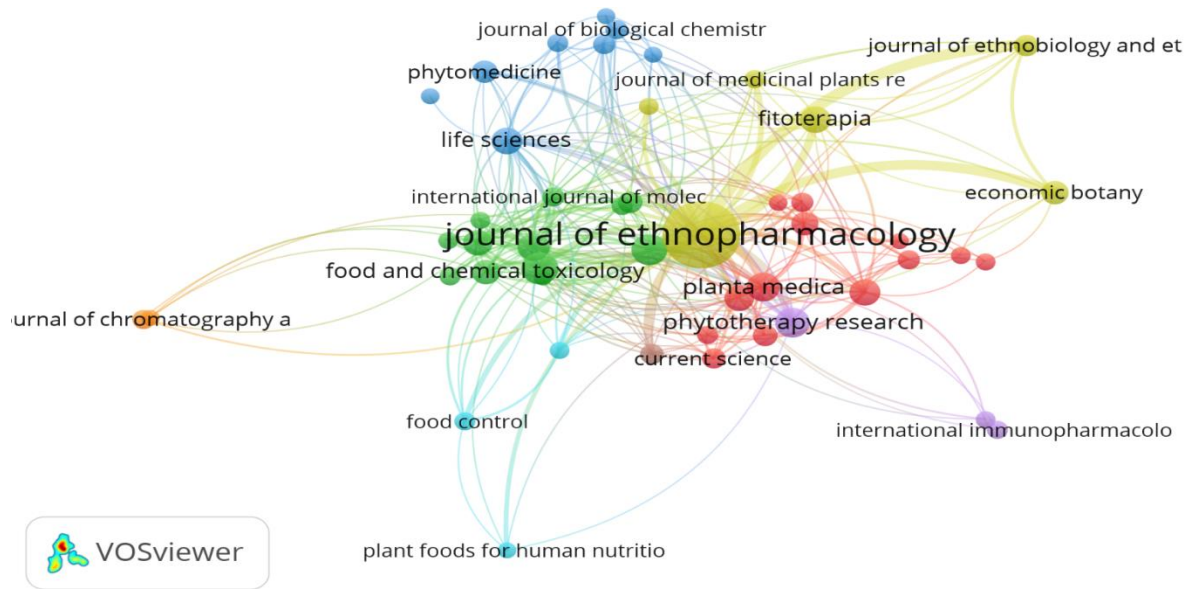
in the range of 1400 to 50751. This table clearly shows that 2 Journals received more than 10000 Citations at global level. 7 Journals received more than 5000 Citations, 45 Journals received more than 1000 Citations. 99 Journals received more than 500 Citations at global level.

S. No	Journal	Recs	TLCS	TGCS
1	Journal of Ethnopharmacology	290	923	50751
2	Food Chemistry	36	66	8478
3	Phytochemistry	32	60	10281
4	Phytotherapy Research	30	60	4900
5	Planta Medica	25	69	5254
6	Molecules	24	11	4565
7	Fitoterapia	21	33	2929
8	Journal of Natural Products	21	50	3254
9	Life Sciences	21	73	6929
10	Journal of Agricultural And Food Chemistry	19	67	8546
11	Current Medicinal Chemistry	18	18	3624
12	Food and Chemical Toxicology	17	31	7218
13	Economic Botany	14	91	2501
14	Proceedings of The National Academy Of Sciences Of The United States of America	14	37	3039
15	Phytomedicine	13	20	2576
16	Journal of Ethnobiology And Ethnomedicine	12	0	1898
17	Industrial Crops and Products	11	9	2140
18	Natural Product Reports	11	8	2079
19	Current Science	10	16	1947
20	Evidence-Based Complementary And Alternative Medicine	10	2	1408



Three Fields Plot (Sources, Institutions and Authors)

Source	Documents	Citations	Total link strength
journal of ethnopharmacology	290	50751	501
food chemistry	36	8478	86
journal of ethnobiology and ethno...	12	1898	80
phytotherapy research	30	4900	79
planta medica	25	5254	71
economic botany	14	2501	66
phytochemistry	32	10281	63
journal of agricultural and food ch...	19	8546	60
life sciences	21	6929	51
evidence-based complementary a...	10	1408	47
fitoterapia	21	2929	47
journal of natural products	21	3254	47
molecules	24	4565	47
current medicinal chemistry	18	3624	43
food and chemical toxicology	17	7218	36
international journal of molecular ...	8	1594	29
industrial crops and products	11	2140	25
food control	7	1309	24
international journal of food micro...	6	1523	24
journal of medicinal plants research	7	1124	24



Citation Network of Sources

Most productive and Cited Authors (5169 Authors)

This table shows that most productive and cited author in the field of medicinal plants. Heinrich M published 17 papers with 3259 citations and put in the first place Chen SL, Li,HB, Pieroni A, Sethi G has published 10 articles each and received the citation 2021, 2354,1483 and 1763. 57 authors received more than 1000 citations , 507 authors are also in the table with more than 500 citations and there are 675 authors with more than 400 citations.

#	Publication Impact			Citation Impact		
	Author	Record	Citations	Author	Record	Citations

		s			s	
1	Heinrich M	17	3259	Cowan MM	1	3882
2	Chen SL	10	2021	Cai YZ	8	3877
3	Li HB	10	2354	Bakkali F	2	3791
4	Pieroni A	10	1483	Averbeck D	1	3689
5	Sethi G	10	1763	Averbeck S	1	3689
6	Van Staden J	9	1315	Waomar M	1	3689
7	Aggarwal BB	8	1608	Corke H	7	3404
8	Cai YZ	8	3877	Heinrich M	17	3259
9	de Albuquerque UP	8	1283	Ternes TA	3	2997
10	Efferth T	8	1577	Sun M	6	2993
11	Ignacimuthu S	8	1147	Williams CA	2	2618
12	Calixto JB	7	1805	Harborne JB	1	2502
13	Corke H	7	3404	Surh YJ	6	2479
14	Jäger AK	7	1153	Pihlaja K	2	2431
15	Song JY	7	1670	Rauha JP	2	2362
16	Verpoorte R	7	1335	Li HB	10	2354
17	Zhu YJ	7	2265	Luo Q	3	2349
18	Hamburger M	6	910	Mazza G	2	2347
19	Houghton PJ	6	1522	Zhu YJ	7	2265
20	Hyde KD	6	1058	Gao L	1	2221
21	Perry EK	6	1350	Oomah BD	1	2221
22	Pezzuto JM	6	1264	Velioglu YS	1	2221
23	Pieters L	6	1042	Heinonen M	1	2185
24	Sun M	6	2993	Hopia AI	1	2185
25	Surh YJ	6	2479	Kahkonen MP	1	2185
26	Towers GHN	6	1014	Kujala TS	1	2185
27	Vlietinck AJ	6	1211	Vuorela HJ	1	2185
28	Yang B	6	803	Chen SL	10	2021
29	Ahmad I	5	1375	Cragg GM	5	1991
30	Ahn KS	5	957	Calixto JB	7	1805

1387 articles have received more than 100 citations. Among the 1387 articles more than 100 Indian authors have published in the top 163 articles. Out of the 163 articles, 137 articles were published by the Indian authors alone. The remaining 26 articles are collaborative work of the Indian authors with authors from other countries.

Authors of USA origin have published 160 articles with more than 100 citations. Among the 160 articles 130 articles are published USA authors alone, only 30 articles are collaborative works with authors from other countries.

From the table it can be observed that Multiple countries publication ratio is very low compared to Single country publications.

Conclusion

The publication of research articles related to Medicinal Plants is very important during this Pandemic time. The literature mapping will be helpful in developing vaccines, in knowing the methods of avoiding the transmissible disease.

From the result of the search it is found that 1387 articles were cited more than 100 times. USA has published 229 articles with 53,813 citations. India ranked second with 33,974 citations for the 187 papers written by the authors contributing to 13.5% of the total citation. China has produced 148 papers with 28,815 citations amounting to 10.7% of the overall citation. A total of 99 countries have received citation with more than 100.

In the collaborative research, USA and China together have published 21 papers and ranked in the 1st position. China and UK is placed in the second position with 14 records, followed by USA and India with a total of 14 publication. The corresponding author wise rank list, the table clearly identifies India is in the 1st position with 163 articles, USA in second place with 160 articles, followed by China with 138 articles finishing 3rd place.

A total of 1528 institutions have been identified as the most productive and cited institutions with their contribution of papers. A total of 441 Journals are identified as the most productive and cited journals in the field of Medicinal plants. Journal of Ethno pharmacology has published 290 articles with 50751 citations at the global level. Heinrich M published 17 papers with 3259 citations and put in the first place.

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