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A Scientometric Analysis of Highly Cited Works on Herbal Drugs, Medicines and Vaccines

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A Scientometric Analysis of Highly Cited Works on Herbal Drugs, Medicines and Vaccines

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Abstract

The present study aims to analyse the research output performance on Herbal Drugs, Medicines and Vaccines. A total of 973 research articles published in Web of Science database were analysed to find out the performance of Herbal Medicines, Drugs and Vaccines developers from all over the world in terms of growth of Publications and Citations impact during the period 1989-2021. Global publication shares, prolific author in the field, high productive Institutions, Journals, are studied in this article. The top most cited countries are: USA with 64799 Citations for 288 (29.6%) Publications followed by People R China with 29264 Citations for 185 (19%) Publications, UK with 22700 Citations for 112 Publications, Germany with 11522 Citations for 65 publications. India recorded 11859 Citations for 61 publications. The most productive institutions were: University Exeter (29), Harvard University National University of Singapore, Chinese Academy of Science and so on. The most Cited Institutions are: Harvard University with 9428 Citations for 22 Publications followed by Beth Israel Deaconess Med Ctr with 6476 Citations for 10 Publications, University of Exeter with 5411 Citations for 29 Publications. The most cited Paper is "Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, et al., Trends in alternative medicine use in the United States, 1990-1997 - Results of a follow-up national survey, JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. 1998 NOV 11; 280 (18): 1569-1575" with 4562 Citations. The most Cited journals were: JOURNAL OF ETHNOPHARMACOLOGY topped the list with 17235 Citations for 101 Publications followed by JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION with 7614 Citations for 8 Publications, PHYTOTHERAPY RESEARCH with 4761 Citations for 21 Publications. It noted that researcher has given the preference to highly impact Journals for their publications.

Keywords: Highly Cited Works; Herbal Medicines; Herbal Drugs; Herbal Vaccines;

INTRODUCTION

Scientific productivity in the form of intellectual contributions communicated in a written form is important to the scientific community. It is measured through publications and citation data. Scientometrics involves quantitative studies of scientific activities. Assessing Herbal Drugs, Medicine and Vaccines related research and publication trends might be the need of the time and may serve as a key to achieve the required readiness to cope with this rising health issue. Therefore, the purpose of our study was to analyze conducted research and available literature on Web of Science Database.

Moreover, this study also explored the Geographical wise distribution of publications, highly cited works, Citations of Institutions, Authors and Journals besides determining the topics taken up by researchers. In this way, research performance evaluation might assist higher authorities to better understand the situation and thus facilitate in decision-making so that strategic changes can be adapted. Bibliometrics is a gateway to evaluate such proceedings and fill the knowledge gap. This study is aimed at assessing Herbal Drugs, Medicine and Vaccines -related research progress over the last three decades (1989-2021) using a wide range of commonly used indicators in bibliometrics and Scientometrics. The work has focused the literature available in the Web of Science database on Herbal Drugs, Medicine and Vaccines studies.

OBJECTIVES OF THE STUDY

This study has the following objectives:

- To ascertain the research productivity of Herbal Drugs, Medicine and Vaccines during 1989-2021;
- to find out the highly productive affiliated institutions;
- To identify the most productive and Cited authors;
- To list core journals communicated by the authors;
- To identify Geographical wise distribution of Publications and Citations;
- To study the highly Cited Works.

METHODOLOGY

There are numerous Abstracting, Indexing and Citation databases available for researchers and academicians, such as Scopus, Web of Science, Indian Citations Index. The most relevant and commonly used database, Web of Science maintain by Clarivate Analytics (WoS), was selected along with appropriate criteria, search topics (“Herbal Medicines”, “Herbal Drugs” and “Herbal Vaccines”), identified from the literature, to retrieve relevant documents. The main objective of the study is to make an assessment, in

quantitative terms with respect to the publications on “Herbal Medicine”, “Herbal Drugs” and “Herbal Vaccine” during the period 1989 to 2020. All the bibliographic details of publications were transferred to software (Histcite, VOS viewer and Biblioshiny). After validation, the data was analyzed as per the requirement of the study.

DATA ANALYSIS AND INTERPRETATIONS

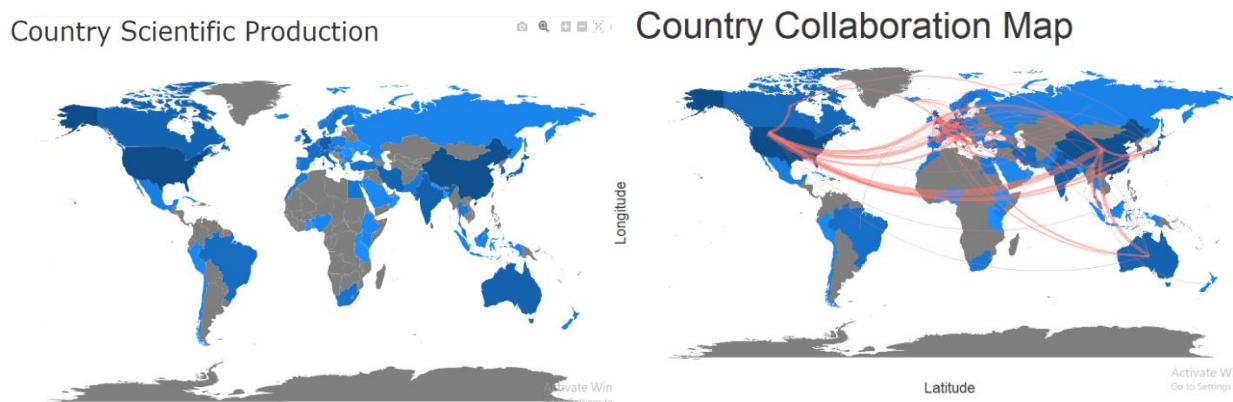
Geographical wise distribution of Publications (70 out of 167 Countries)

In Herbal Medicine, Drugs and Vaccines, 4607 authors from 70 countries registered 973 papers with 100-4562 Citations. The top most cited countries are: USA with 64799 Citations for 288 (29.6%) Publications followed by People R China with 29264 Citations for 185(19%) Publications, UK with 22700 Citation for 112 Publications, Germany with 11522 Citations for 65 publications and India with 11859 Citations for 61 publications. There were a total of 167 countries involved in the field of Herbal Medicine, Drugs and Vaccines. 70 countries received more than 100 Citations. It is noted that 29 countries recorded more than 1000 Citations, 45 countries recorded more than 500 Citations and 70 countries recorded more than 100 Citations. It is also noted 20 countries contributed more than 10 Publications. 5 countries received 140163 Citations out of 186063.

Table:1 Geographical wise distribution of Publications

#	Country	Records	%	Citations	Country	Records	%	Citations
1	USA	288	29.6	64799	Poland	4	0.4	568
2	Peoples R China	185	19.0	29264	Bulgaria	3	0.3	452
3	UK	112	11.5	22709	Chile	3	0.3	420
4	Germany	65	6.7	11522	Czech Republic	3	0.3	589
5	India	61	6.3	11859	Finland	3	0.3	595
6	Australia	43	4.4	6561	HONG KONG	3	0.3	345
7	Japan	43	4.4	7112	Iceland	3	0.3	897
8	Italy	40	4.1	7693	Ireland	3	0.3	359
9	Taiwan	36	3.7	6111	Jordan	3	0.3	381
10	South Korea	31	3.2	4337	Thailand	3	0.3	555
11	Canada	29	3.0	6709	Indonesia	2	0.2	303
12	Iran	27	2.8	4736	Lebanon	2	0.2	221
13	Singapore	23	2.4	5061	Peru	2	0.2	269
14	Netherlands	17	1.7	2955	Portugal	2	0.2	382
15	Switzerland	17	1.7	3088	Russia	2	0.2	209

16	Unknown	17	1.7	2675	Saudi Arabia	2	0.2	750
17	Brazil	13	1.3	2304	Serbia	2	0.2	866
18	France	13	1.3	2003	U Arab Emirates	2	0.2	826
19	Israel	10	1.0	2165	Bangladesh	1	0.1	190
20	Turkey	10	1.0	1782	Belize	1	0.1	124
21	Belgium	9	0.9	2372	Benin	1	0.1	113
22	Spain	8	0.8	1048	Bosnia & Hercegovina	1	0.1	120
23	Sweden	8	0.8	2140	Cuba	1	0.1	114
24	Austria	7	0.7	1207	Ethiopia	1	0.1	174
25	Egypt	7	0.7	1033	Ghana	1	0.1	703
26	Malaysia	7	0.7	1204	KENYA	1	0.1	115
27	South Africa	7	0.7	886	Luxembourg	1	0.1	104
28	Greece	5	0.5	1314	Nepal	1	0.1	118
29	Hungary	5	0.5	890	Nigeria	1	0.1	156
30	Norway	5	0.5	1008	Oman	1	0.1	646
31	Pakistan	5	0.5	754	Romania	1	0.1	119
32	Denmark	4	0.4	1101	Serbia Montenegro	1	0.1	114
33	Mexico	4	0.4	618	Tanzania	1	0.1	101
34	Morocco	4	0.4	886	Uganda	1	0.1	172
35	New Zealand	4	0.4	692	Ukraine	1	0.1	303

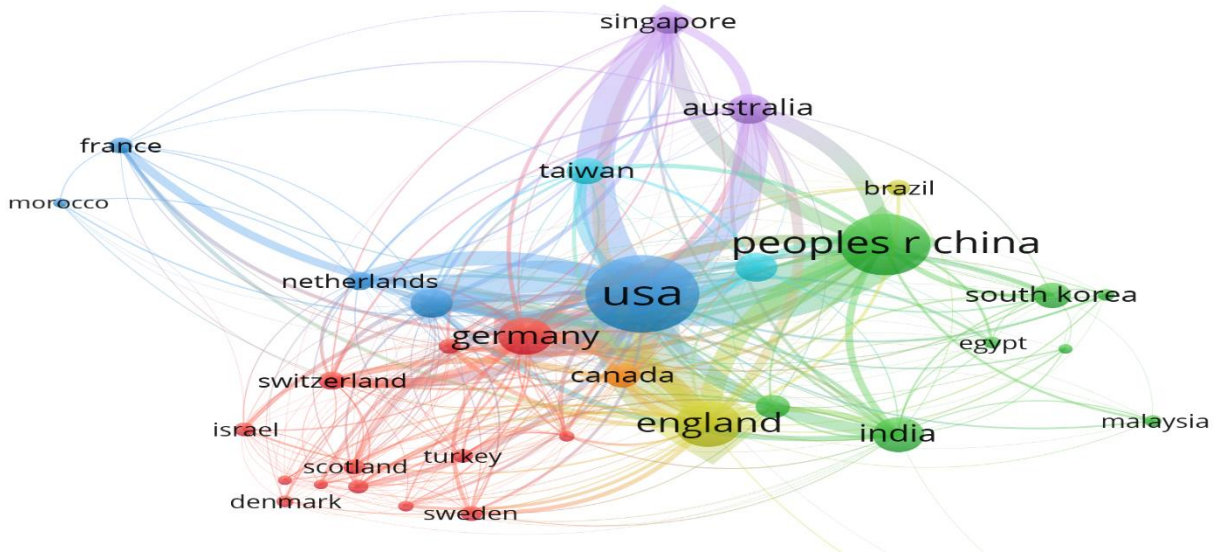


Geographical wise Collaboration

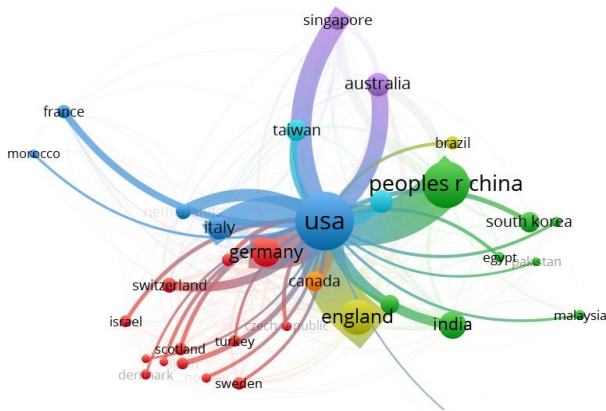
Looking at the collaborating countries, USA more than 250 of the contribution with leading countries like China, Germany, United Kingdom, Canada, Italy, Korea, Japan etc., followed by China with 179 publications leading counties like Singapore, Australia, UK, Japan, Canada Germany etc., UK83 publications with leading countries like Germany, Italy, Netherland, Switzerland, Belgium etc.

Table 2: Citations and Collaboration Links

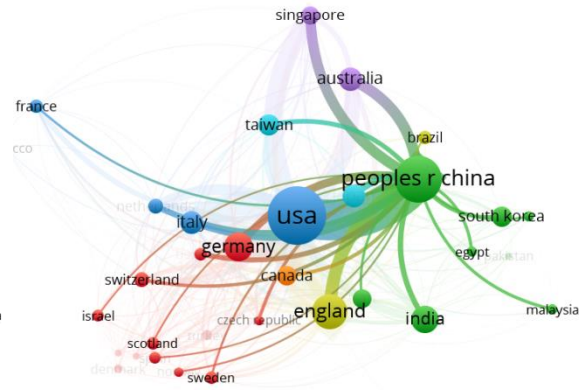
Country	Documents	Citations	Total link strength
usa	295	65892	1431
england	103	20303	730
peoples r china	187	29785	611
germany	68	12023	530
italy	41	7760	391
singapore	24	5191	288
australia	43	6561	269
india	61	11859	199
netherlands	17	2950	195
switzerland	17	3088	180
japan	40	6521	171
canada	29	6709	165
taiwan	36	6147	119
belgium	12	3231	113
spain	10	1804	83
france	13	2003	82
czech republic	6	1525	79
south korea	32	4451	75
sweden	11	3086	68
iran	27	4736	65



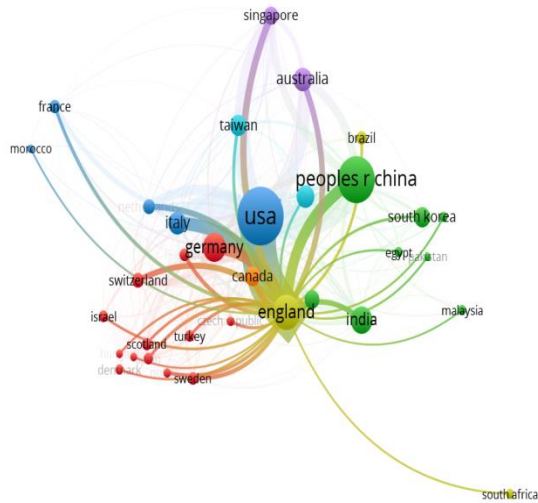
Citation Network of Countries



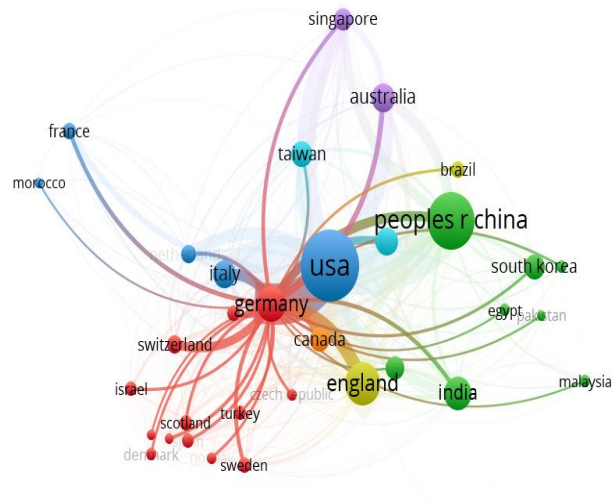
Citation Network of USA



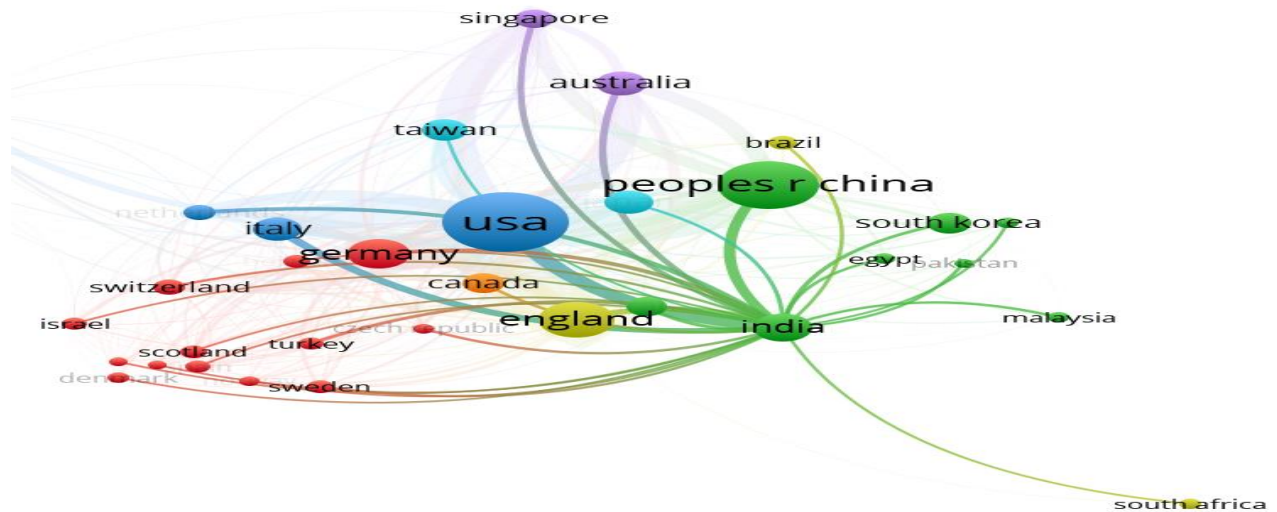
Citation Network of China



Citation Network of England



Citation Network of Germany



Citation Network of India

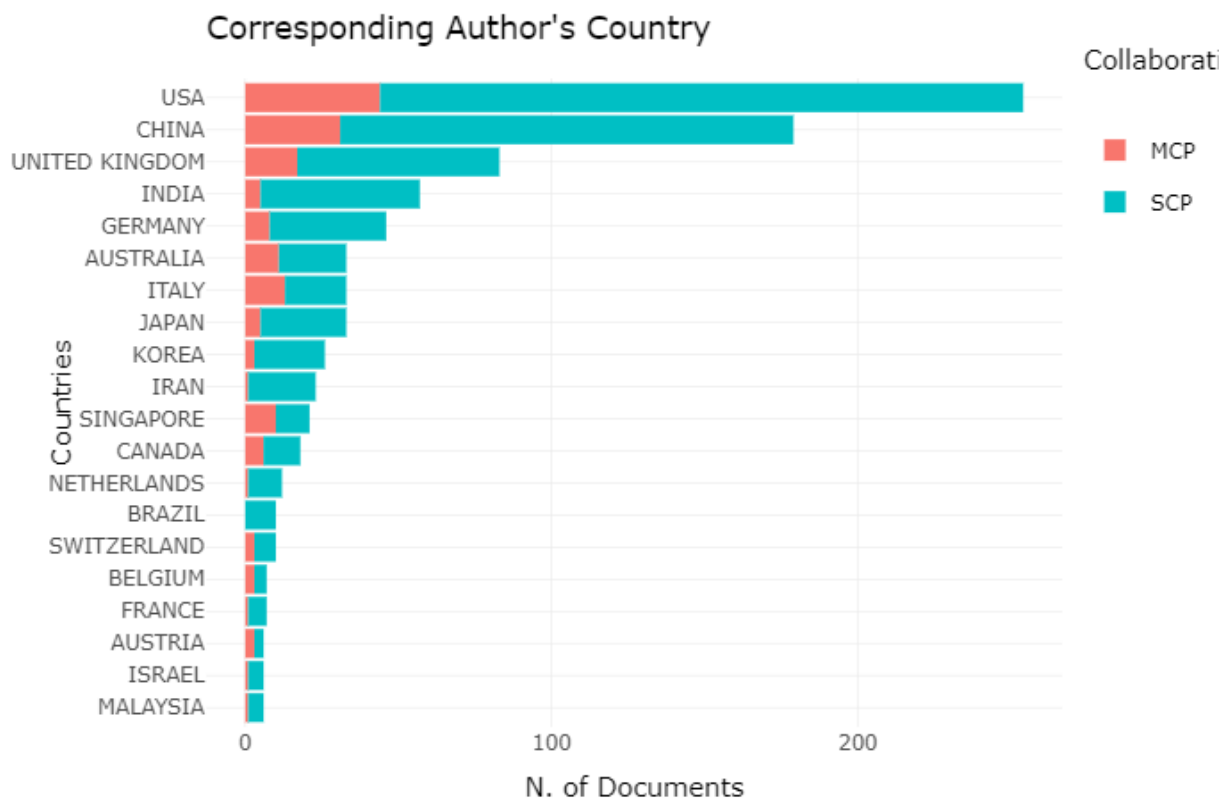
Corresponding Author’s Country

Country and collaboration trend was towards Multiple Country Publications. There were 15 countries with 10-254 articles are Internationally collaborated with single and multiple countries. Most collaborated countries are: USA with 254 Publications followed by China with 179, UK with 83 and India with 57 Publications. Table 3 depicts Single Country Publications and Multiple Country Publications in the field.

Table 4: Corresponding Author's Country

Country	Articles	Frequency	Single Country Publications	Single Country Publications	MCP_Ratio
USA	254	0.26681	210	44	0.1732
CHINA	179	0.18803	148	31	0.1732
UNITED KINGDOM	83	0.08718	66	17	0.2048
INDIA	57	0.05987	52	5	0.0877
GERMANY	46	0.04832	38	8	0.1739
AUSTRALIA	33	0.03466	22	11	0.3333
ITALY	33	0.03466	20	13	0.3939
JAPAN	33	0.03466	28	5	0.1515
KOREA	26	0.02731	23	3	0.1154
IRAN	23	0.02416	22	1	0.0435
SINGAPORE	21	0.02206	11	10	0.4762
CANADA	18	0.01891	12	6	0.3333
NETHERLANDS	12	0.01261	11	1	0.0833
BRAZIL	10	0.0105	10	0	0
SWITZERLAND	10	0.0105	7	3	0.3
BELGIUM	7	0.00735	4	3	0.4286
FRANCE	7	0.00735	6	1	0.1429
AUSTRIA	6	0.0063	3	3	0.5
ISRAEL	6	0.0063	5	1	0.1667
MALAYSIA	6	0.0063	5	1	0.1667
TURKEY	6	0.0063	4	2	0.3333
SOUTH AFRICA	5	0.00525	4	1	0.2
MEXICO	4	0.0042	2	2	0.5
MOROCCO	4	0.0042	3	1	0.25
NORWAY	4	0.0042	2	2	0.5
SWEDEN	4	0.0042	2	2	0.5
BULGARIA	3	0.00315	2	1	0.3333
CZECH REPUBLIC	3	0.00315	3	0	0
EGYPT	3	0.00315	2	1	0.3333
HUNGARY	3	0.00315	2	1	0.3333
JORDAN	3	0.00315	3	0	0
PAKISTAN	3	0.00315	3	0	0
POLAND	3	0.00315	2	1	0.3333
SPAIN	3	0.00315	3	0	0
CHILE	2	0.0021	0	2	1
DENMARK	2	0.0021	1	1	0.5
FINLAND	2	0.0021	2	0	0
GREECE	2	0.0021	2	0	0

PORTUGAL	2	0.0021	2	0	0
RUSSIA	2	0.0021	1	1	0.5
THAILAND	2	0.0021	2	0	0
BANGLADESH	1	0.00105	0	1	1
BENIN	1	0.00105	0	1	1
BOSNIA	1	0.00105	0	1	1
ETHIOPIA	1	0.00105	1	0	0
GHANA	1	0.00105	1	0	0
HONG KONG	1	0.00105	1	0	0
ICELAND	1	0.00105	0	1	1
IRELAND	1	0.00105	1	0	0
KENYA	1	0.00105	0	1	1
LEBANON	1	0.00105	0	1	1
NEW ZEALAND	1	0.00105	1	0	0
NIGERIA	1	0.00105	1	0	0
OMAN	1	0.00105	0	1	1
PERU	1	0.00105	1	0	0
SAUDI ARABIA	1	0.00105	1	0	0
SERBIA	1	0.00105	1	0	0
U ARAB EMIRATES	1	0.00105	1	0	0



Most Cited Institutions

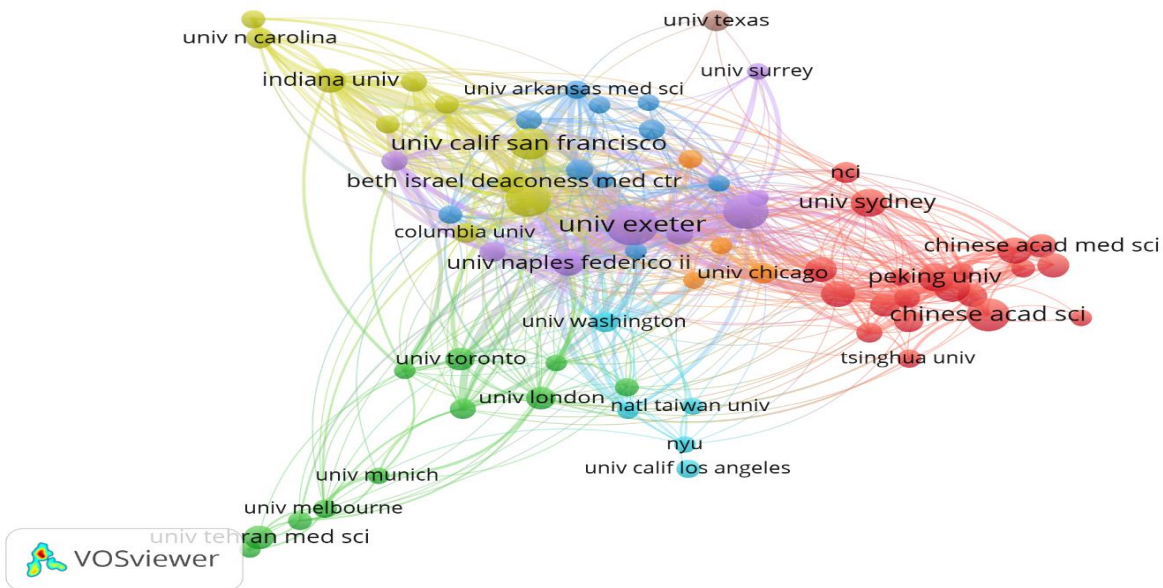
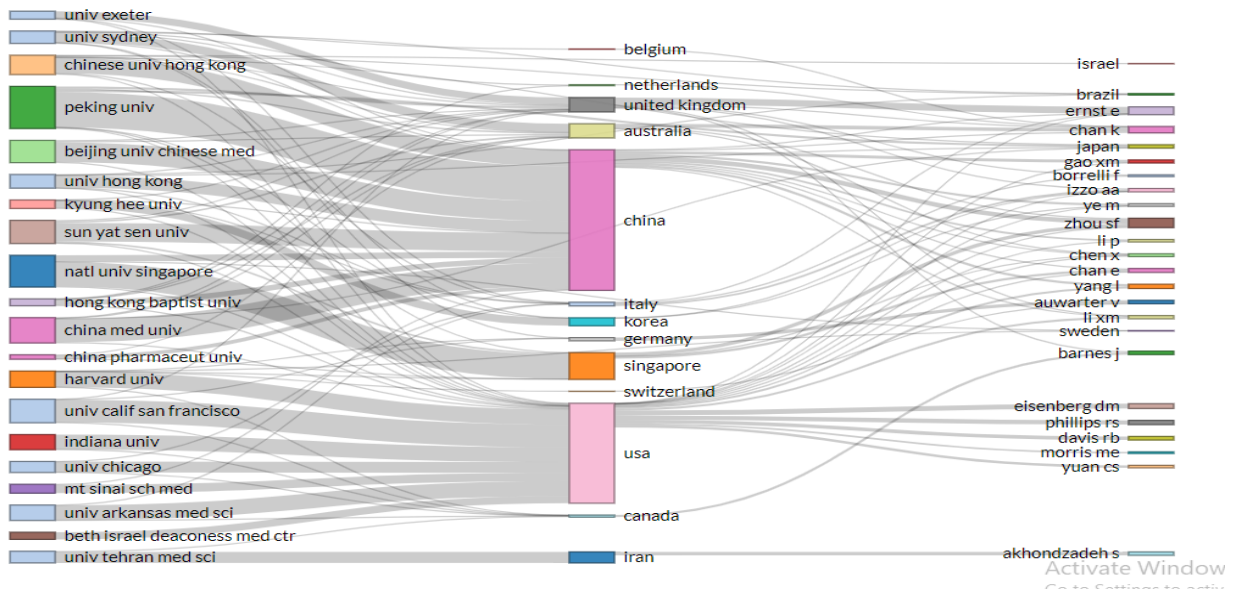
Table 5 - presents data on the number of Citations and Publications on Herbal Medicine, Drugs and Vaccine subject contributed by various different research organizations in the world. There were 1203 institutions involved in the research with minimum of 100 Citations each paper. The most productive institutions were: Univ Exeter(29), Harvard University National University of Singapore, Chinese Academy of Science and so on. The most Cited Institutions are: Harvard University with 9428 Citations for 22 Publications followed by Beth Israel Deaconess Medical Centre with 6476 Citations for 10 Publications, University of Exeter with 5411 Citations for 29 Publications. It is noted that 66 Institutions received 1000 and above Citations, 193 Institutions with 500 and Above Citations and 1203 Institutions with 100 and above Citations. Table 5 gives the list of institutions recorded 1500 or more Citations during the study period. Figure shows a three-field plot for the top 20 most productive Institutions, Countries and Authors.

Table 5: Most Cited Institutions

#	Publication Impact			Citation Impact		
	Institution	Records	Citations	Institution	Records	Citations
1	University Exeter	29	5411	Harvard Univ	22	9428
2	Harvard University	22	9428	Beth Israel Deaconess Med Ctr	10	6476
3	National University of Singapore	22	4948	Univ Exeter	29	5411
4	Chinese Acad Science	20	3688	Natl Univ Singapore	22	4948
5	Univ Calif San Francisco	18	4092	Univ Calif San Francisco	18	4092
6	Chinese Univ Hong Kong	15	2309	Chinese AcadSci	20	3688
7	Peking University	15	2356	Univ Chicago	8	2864
8	Univ Sydney	14	2115	Univ Toronto	9	2849
9	China Acad Chinese Med Sci	12	1495	Indiana Univ	11	2438
10	Hong Kong Baptist Univ	12	2059	Univ Naples Federico II	11	2391
11	China Pharmaceut Univ	11	1539	Peking Univ	15	2356
12	Chinese Acad Med Sci	11	1598	Chinese Univ Hong Kong	15	2309
13	Indiana Univ	11	2438	Univ Sydney	14	2115
14	Kyung Hee Univ	11	1400	Univ London	9	2077
15	Univ Naples Federico II	11	2391	Hong Kong Baptist Univ	12	2059
16	Beijing Univ Chinese Med	10	1373	Univ N Carolina	8	1925
17	Beth Israel Deaconess Med Ctr	10	6476	Stanford Univ	5	1764
18	Univ Tehran Med Sci	10	1696	SUNY Buffalo	7	1739
19	Sun Yat Sen Univ	9	1601	Univ Tehran Med Sci	10	1696
20	Univ Hong Kong	9	1595	NCI	8	1684
21	Univ London	9	2077	Univ Michigan	6	1667

22	Univ Toronto	9	2849	Cent S Univ	8	1624
23	Univ Western Sydney	9	1194	Univ Calif Los Angeles	6	1621
24	Cent S Univ	8	1624	All India Inst Med Sci	4	1620
25	NCI	8	1684	Univ Haifa	6	1618
26	Univ Chicago	8	2864	Sun Yat Sen Univ	9	1601
27	Univ Med Ctr Freiburg	8	1546	Chinese Acad Med Sci	11	1598
28	Univ N Carolina	8	1925	George Washington Univ	4	1598
29	Univ Texas	8	1353	Univ Hong Kong	9	1595
30	Columbia Univ	7	1082	Johns Hopkins Univ	7	1590

Three-Fields Plot: Institutions, Countries and Authors



Selected	Organization	Documents	Citations	Total link strength
<input checked="" type="checkbox"/>	univ exeter	29	5411	241
<input checked="" type="checkbox"/>	natl univ singapore	22	4948	201
<input checked="" type="checkbox"/>	univ naples federico ii	11	2391	178
<input checked="" type="checkbox"/>	harvard univ	22	9428	156
<input checked="" type="checkbox"/>	sun yat sen univ	8	1481	111
<input checked="" type="checkbox"/>	beth israel deaconess med ctr	10	6476	98
<input checked="" type="checkbox"/>	univ calif san francisco	18	4092	92
<input checked="" type="checkbox"/>	indiana univ	11	2438	87
<input checked="" type="checkbox"/>	rmit univ	5	931	78
<input checked="" type="checkbox"/>	us fda	7	1124	66
<input checked="" type="checkbox"/>	univ plymouth	7	1203	65
<input checked="" type="checkbox"/>	univ arkansas med sci	6	1012	61
<input checked="" type="checkbox"/>	univ washington	7	1281	57
<input checked="" type="checkbox"/>	univ zurich hosp	6	1543	56
<input checked="" type="checkbox"/>	univ maryland	5	1029	52
<input checked="" type="checkbox"/>	univ chicago	8	2864	50
<input checked="" type="checkbox"/>	univ sydney	14	2115	47
<input checked="" type="checkbox"/>	cent s univ	7	1504	43
<input checked="" type="checkbox"/>	peking univ	14	2236	42
<input checked="" type="checkbox"/>	chinese univ hong kong	14	2189	40

Most Cited Journals

The total number of 973 articles related to Herbal Medicine, Drugs and Vaccines scattered in 403 individual journals. The most Cited journals were: JOURNAL OF ETHNOPHARMACOLOGY topped the list with 17235 Citations for 101 Publications followed by JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION with 7614 Citations for 8 Publications, PHYTOTHERAPY RESEARCH with 4761 Citations for 21 Publications. It noted that researcher has given the preference to highly impact Journals for their publications. It also noted that 93 sources registered more than 500 Citations each source, 403 sources with more than 100 Citations each and More than 10 sources with minimum of 10 Publications.

Table 6: Most Cited Journals

#	Journal	Records	TLCS	TGCS
1	JOURNAL OF ETHNOPHARMACOLOGY	101	113	17235
2	JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION	8	144	7614
3	PHYTOTHERAPY RESEARCH	21	37	4761
4	PHYTOMEDICINE	16	67	3800
5	LANCET	7	38	2769
6	ANNALS OF INTERNAL MEDICINE	12	103	2621
7	BIOCHEMICAL PHARMACOLOGY	8	32	2503
8	ARCHIVES OF INTERNAL MEDICINE	8	66	2387
9	CLINICAL PHARMACOLOGY & THERAPEUTICS	11	191	2372
10	JOURNAL OF CHROMATOGRAPHY A	14	34	2167
11	PLANTA MEDICA	14	16	1975
12	JOURNAL OF ALLERGY AND CLINICAL IMMUNOLOGY	9	14	1879
13	PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA	6	47	1735
14	JOURNAL OF CHROMATOGRAPHY B-ANALYTICAL TECHNOLOGIES IN THE BIOMEDICAL AND LIFE SCIENCES	9	31	1668
15	JOURNAL OF ALTERNATIVE AND COMPLEMENTARY MEDICINE	7	8	1659
16	LIFE SCIENCES	10	17	1619
17	FOOD AND CHEMICAL TOXICOLOGY	8	11	1540
18	FITOTERAPIA	10	6	1539

19	EVIDENCE-BASED COMPLEMENTARY AND ALTERNATIVE MEDICINE	10	4	1515
20	DRUGS	5	52	1473
21	FOOD CHEMISTRY	8	2	1428
22	CANCER LETTERS	9	18	1310
23	CURRENT MEDICINAL CHEMISTRY	8	11	1278
24	JOURNAL OF PHARMACY AND PHARMACOLOGY	6	8	1255
25	EUROPEAN JOURNAL OF CLINICAL PHARMACOLOGY	7	37	1243
26	PLOS ONE	9	0	1240
27	DRUG METABOLISM AND DISPOSITION	9	24	1232
28	JOURNAL OF NEUROSCIENCE	2	3	1185
29	DRUG SAFETY	7	70	1171
30	JOURNAL OF CLINICAL ONCOLOGY	6	17	1157
31	AMERICAN JOURNAL OF CLINICAL NUTRITION	4	4	1155
32	JOURNAL OF MASS SPECTROMETRY	6	47	1141
33	ANALYTICA CHIMICA ACTA	6	7	1125
34	CELLULAR AND MOLECULAR LIFE SCIENCES	1	8	1125
35	NEW ENGLAND JOURNAL OF MEDICINE	5	17	1090
36	BRITISH JOURNAL OF CLINICAL PHARMACOLOGY	7	26	1077

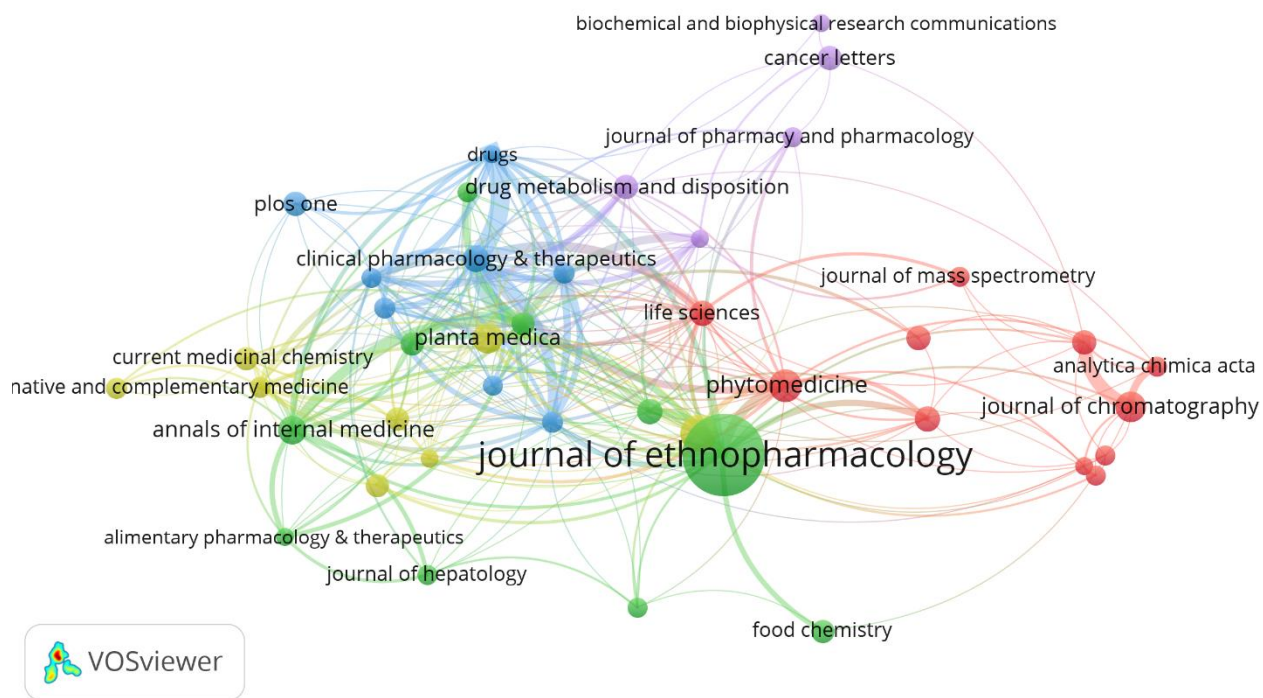
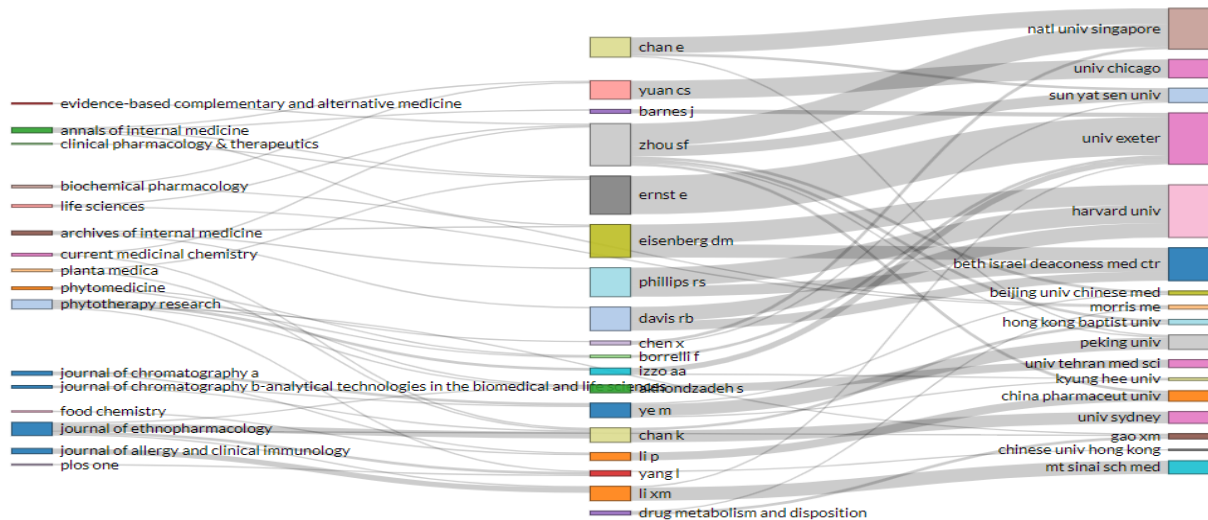


Figure : Citation Network of Sources

Selected	Source	Documents	Citations	Total link strength
<input checked="" type="checkbox"/>	clinical pharmacology & therapeut...	11	2372	112
<input checked="" type="checkbox"/>	jama-journal of the american medi...	8	7614	88
<input checked="" type="checkbox"/>	journal of ethnopharmacology	101	17235	86
<input checked="" type="checkbox"/>	drugs	5	1473	76
<input checked="" type="checkbox"/>	drug safety	7	1171	64
<input checked="" type="checkbox"/>	annals of internal medicine	12	2621	58
<input checked="" type="checkbox"/>	phytomedicine	16	3800	52
<input checked="" type="checkbox"/>	current drug metabolism	6	983	49
<input checked="" type="checkbox"/>	life sciences	10	1619	49
<input checked="" type="checkbox"/>	lancet	7	2769	45
<input checked="" type="checkbox"/>	british journal of clinical pharmaco...	7	1077	40
<input checked="" type="checkbox"/>	phytotherapy research	21	4761	39
<input checked="" type="checkbox"/>	europaen journal of clinical pharm...	7	1243	35
<input checked="" type="checkbox"/>	new england journal of medicine	5	1090	34
<input checked="" type="checkbox"/>	archives of internal medicine	8	2387	32
<input checked="" type="checkbox"/>	planta medica	14	1975	30
<input checked="" type="checkbox"/>	drug metabolism and disposition	9	1232	28
<input checked="" type="checkbox"/>	evidence-based complementary a...	10	1515	28
<input checked="" type="checkbox"/>	journal of chromatography a	14	2167	28
<input checked="" type="checkbox"/>	journal of chromatography b-anal...	9	1668	24



Three-fields Plot: Journals, Authors and Institutions

Most Cited Authors

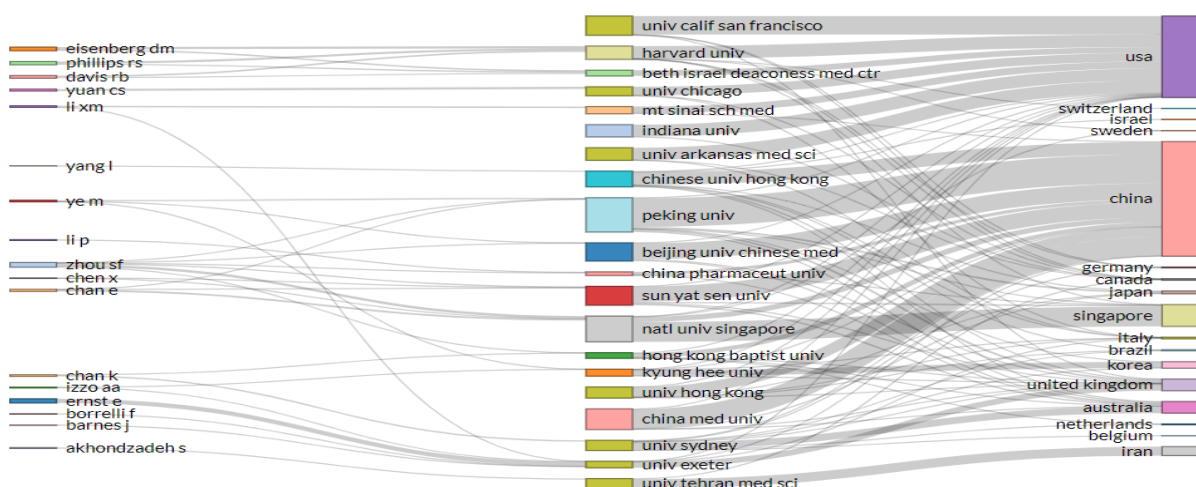
The study reveals that Ernst E is the most productive author contributing 29 publications followed by Zhou SF with 14 publications, Eisenberg DM with 11 publications, Chan K and Izzo AA with 10 Publications respectively. It is noted that 5 authors each have >10 Publications. The most Cited authors are: Eisenberg DM with 7219 Citations for 11 Publications followed by Davis RB with 6109 Citations for 7 Papers, Ernst E with 5529 Citations for 29 papers. 58 authors recorded more than 1000 Citations, 232 Authors recorded more than 500 Citations and 3837 authors recorded more than 100 Citations.

Table 7: Most Cited Authors

#	Author	Records	Citations	Author	Records	Citations
1	Ernst E	29	5529	Eisenberg DM	11	7219
2	Zhou SF	14	3055	Davis RB	7	6109
3	Eisenberg DM	11	7219	Ernst E	29	5529
4	Chan K	10	1986	Appel S	1	4562
5	Izzo AA	10	2172	Ettner SL	1	4562
6	Phillips RS	9	2241	Kessler RC	1	4562
7	Ye M	9	1360	van Rompay M	1	4562
8	Davis RB	7	6109	Wilkey S	1	4562
9	Li P	7	1640	Zhou SF	14	3055
10	Li XM	7	971	Yuan CS	6	2418
11	Morris ME	7	1739	Phillips RS	9	2241
12	Akhondzadeh S	6	837	Izzo AA	10	2172
13	Auwarter V	6	1323	Chan K	10	1986

14	Borrelli F	6	1126	Kliwer SA	4	1780
15	Chan E	6	1347	Wu JA	4	1743
16	Yang L	6	1539	Morris ME	7	1739
17	Yuan CS	6	2418	Li P	7	1640
18	Barnes J	5	966	Attele AS	3	1620
19	Chen X	5	807	Yang L	6	1539
20	Gao XM	5	791	Willson TM	3	1517
21	Huang M	5	1077	Kelly JP	3	1511
22	Jamshidi AH	5	729	Grover JK	3	1478
23	Li S	5	940	Fugh-Berman A	4	1470
24	Li Y	5	1301	Vanherweghem JL	4	1446
25	Liang YZ	5	1263	Anderson TE	2	1396
26	Patwardhan B	5	881	Kaufman DW	2	1396
27	Pittler MH	5	859	Mitchell AA	2	1396
28	Wang YT	5	583	Rosenberg L	2	1396
29	Xie PS	5	1275	Ye M	9	1360
30	Zhang B	5	968	Goodwin B	2	1356

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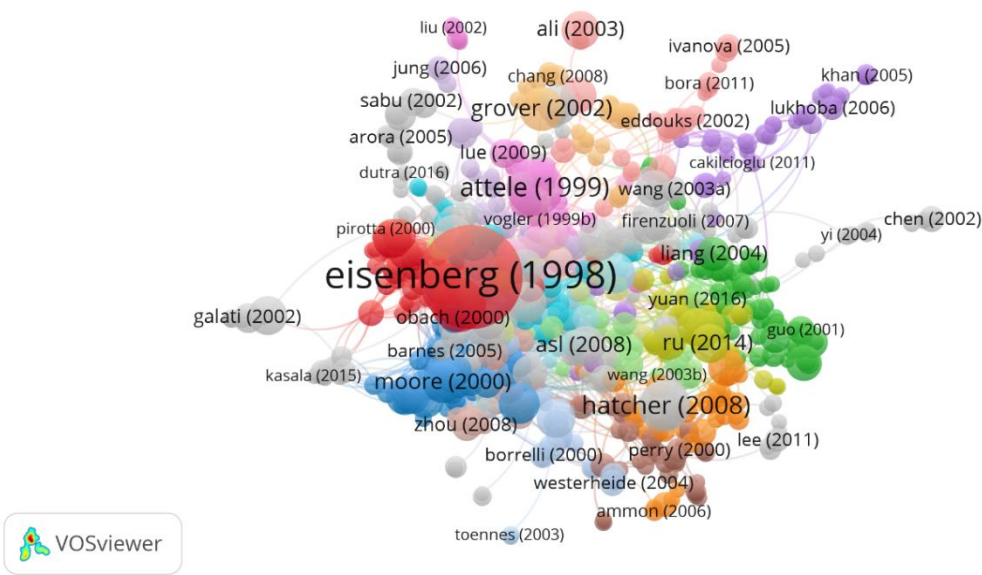
Highly Cited works

Based on publication output on Herbal Medicine, Drugs and Vaccines, highly cited papers were also evaluated, and the top 10 cited documents are shown in Table 8. 5 documents are shown to have been cited >1000, and 35 papers recorded more than 500 Citations. The most cited Paper is “Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, et al., Trends in alternative medicine use in the United States, 1990-1997 - Results of a follow-up national survey, JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. 1998 NOV 11; 280 (18): 1569-1575” with 4562 Citations, followed by “Attele AS, Wu

JA, Yuan CS, Ginsengpharmacology - Multipleconstituents and multipleactions, BIOCHEMICAL PHARMACOLOGY. 1999 DEC 1; 58 (11): 1685-1693” with 1381 Citations. Out of 10, 8 publications from USA and one each from India and Belgium.

Table 8: Highly Cited works

#	Date / Author / Journal	Countries	GCS	CR
1	67Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, et al. Trends in alternativemedicineuse in the UnitedStates, 1990-1997 - Results of a follow-up nationalsurvey JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. 1998 NOV 11; 280 (18): 1569-1575	USA	4562	29
2	86Attele AS, Wu JA, Yuan CS, Ginsengpharmacology - Multipleconstituents and multipleactions, BIOCHEMICAL PHARMACOLOGY. 1999 DEC 1; 58 (11): 1685-1693	USA	1381	80
3	202Kaufman DW, Kelly JP, Rosenberg L, Anderson TE, Mitchell AA, Recentpatterns of medicationuse in the ambulatoryadultpopulation of the UnitedStates - The Slonesurvey JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. 2002 JAN 16; 287 (3): 337-344	USA	1224	32
4	632Hatcher H, Planalp R, Cho J, Tortia FM, Torti SV Curcumin: From ancientmedicine to currentclinicaltrials CELLULAR AND MOLECULAR LIFE SCIENCES. 2008 JUN; 65 (11): 1631-1652	USA	1125	226
5	187Lim GP, Chu T, Yang FS, Beech W, Frautschy SA, et al. The curryspsicecurcuminreducesoxidativedamage and amyloidpathology in an Alzheimertransgenicmouse JOURNAL OF NEUROSCIENCE. 2001 NOV 1; 21 (21): 8370-8377	USA	1059	73
6	224Grover JK, Yadav S, Vats V Medicinalplants of India with anti-diabeticpotential JOURNAL OF ETHNOPHARMACOLOGY. 2002 JUN; 81 (1): Art. No. PII S0378-8741(02)00059-4	India	847	219
7	536Chang ET, Adami HO The enigmaticcepidemiology of nasopharyngealcarcinoma CANCER EPIDEMIOLOGY BIOMARKERS & PREVENTION. 2006 OCT; 15 (10): 1765-1777	USA, Sweden and Singapore	816	335
8	9VANHERWEGHEM JL, DEPIERREUX M, TIELEMANS C, ABRAMOWICZ D, DRATWA M, et al. RAPIDLYPROGRESSIVEINTERSTITIALRENALFIBROSIS IN YOUNG-WOMEN - ASSOCIATION WITH SLIMMINGREGIMENINCLUDINGCHINESEHERBS LANCET. 1993 FEB 13; 341 (8842): 387-391	Belgium	766	26
9	96Fugh-Berman A Herb-druginteractions LANCET. 2000 JAN 8; 355 (9198): 134-138	USA	740	65
10	116Moore LB, Goodwin B, Jones SA, Wisely GB, Serabjit-Singh CJ, et al., St. John's wortinduceshepaticdrugmetabolism through activation of the pregnane X receptor PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA. 2000 JUN 20; 97 (13): 7500-7502	USA	731	22



Selected	Document	Citations	Links
<input checked="" type="checkbox"/>	eisenberg (1998)	4562	98
<input checked="" type="checkbox"/>	hu (2005)	419	56
<input checked="" type="checkbox"/>	fugh-berman (2000)	740	50
<input checked="" type="checkbox"/>	izzo (2001)	438	45
<input checked="" type="checkbox"/>	johne (1999)	413	43
<input checked="" type="checkbox"/>	moore (2000)	731	42
<input checked="" type="checkbox"/>	zhou (2003)	291	41
<input checked="" type="checkbox"/>	durr (2000)	456	38
<input checked="" type="checkbox"/>	de smet (2002)	372	38
<input checked="" type="checkbox"/>	ulbricht (2008)	107	37
<input checked="" type="checkbox"/>	izzo (2009)	373	36
<input checked="" type="checkbox"/>	ang-lee (2001)	520	35
<input checked="" type="checkbox"/>	izzo (2005b)	151	35
<input checked="" type="checkbox"/>	wang (2001)	261	34
<input checked="" type="checkbox"/>	miller (1998)	517	33
<input checked="" type="checkbox"/>	roby (2000)	242	33
<input checked="" type="checkbox"/>	zhou (2004a)	279	32
<input checked="" type="checkbox"/>	mannel (2004)	139	31
<input checked="" type="checkbox"/>	elvin-lewis (2001)	112	29
<input checked="" type="checkbox"/>	zhou (2007b)	108	29
<input checked="" type="checkbox"/>	zhou (2007c)	101	29

FINDINGS AND CONCLUSIONS

The study has observed a gradual growth in number of publications and Citation impact in the field. Frequently occurred author affiliations prove that countries like USA; China; UK, Germany and India are actively engaged research and registered highest number of Citation in the field. It is noted that India ranked 5th position among the country with 11859 Citations and published 61 publications with more than 100 Citations. The highly preferred journals to publish the articles by the authors in the field were identified as high Impact journals. Findings show that the top most productive authors (Ernst E, Zhou SF, Eisenberg DM and Chan K and Izzo AA) have >10

publications, and they also have ≥ 2000 citations, thus displaying consistency both in terms of productivity and impact. 5 documents are shown to have been cited >1000 , and 35 papers recorded more than 500 Citations. It also noted that 93 sources registered more than 500 Citations each source, 403 sources with more than 100 Citations each and More than 10 sources with minimum of 10 Publications.

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- **Surulinathi, M., Arputha Sahayarani, Y., Srinivasaragavan, S., & Jayasuriya, T. (2020).** Research output on Covid-19/Coronavirus Vaccine: A Scientometric Study. *Library Philosophy and Practice (e-journal)*, 4781, 1-16.
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