

Global Research Productivity on *Calotropis* spp. Over the Last Decade (2011-2020): A Bibliometric Evaluation

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History

- Submission Date: 05-05-2021;
- Review completed: 25-05-2021;
- Accepted Date: 06-06-2021

DOI : 10.5530/pres.13.3.2

Article Available online

<http://www.phcogres.com>

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ABSTRACT

Aim: In this study, we performed a bibliometric analysis focusing on the general patterns of scientific publications about *Calotropis*, bibliometric analysis of *Calotropis* research carried out globally from 2011 to 2020. **Materials and Methods:** The analysis is based on 6,584 research articles identified using the Scopus database tool, further Bibliometric tools such as Biblioshiny and VOSviewer have been used to perform bibliometric analysis and build data matrixes for co-citation, coupling, scientific collaboration analysis, and co-word analysis.

Results: The results show that there is an increase in the number of articles, particularly from countries like India and China. Ramos, Márcio Viana and Rahmatullah, Mohammed are identified as the most influential authors, and King Saud University, Saudi Arabia and Universidade Federal do Ceara, Brazil as key organisations. "Methods for *in vitro* evaluating antimicrobial activity: A review" this paper total of 1679 citations are received. Total of 105 articles published during this period are highly cited. Journal of Ethnopharmacology and International Journal of Pharmacy and Pharmaceutical Sciences are the important journals identified. The most common area of the research focus has been on the most common area of the research focus has been on the Agricultural and Biological Sciences, Pharmacology, Toxicology and Pharmaceutics, Biochemistry, Genetics, and Molecular Biology and Medicine. **Findings:** Our findings can act as a useful reference for researchers, and provide insights for directing future research on *Calotropis* that has potential implications for forming across the world.

Keywords: *Calotropis*, Bibliometric evaluation, Scopus database, International collaboration.

INTRODUCTION

The term of therapeutic plants incorporate a different sorts of plants utilized in herbalism and a portion of these plants have a restorative exercises. These restorative plants consider as a rich assets of fixings which can be utilized in drug advancement and blend. Other than that these plants assume a basic part in the advancement of human societies around the entire world. Additionally, a few plants consider as significant wellspring of sustenance and because of that these plants suggested for their helpful qualities. These plants incorporate ginger, green tea, pecans and some others plants. Different plants their subsidiaries consider as significant hotspot for dynamic fixings.^[1]

Nowadays the term Alternative Medicine turned out to be normal in western culture, it centre on utilizing the plants for restorative reason. However, the current conviction that meds which come in containers or pills are the solitary drugs that we can trust and utilize. Indeed, even so the greater part of these pills and containers we take and use during our day by day life came from plants. Therapeutic plants oftentimes utilized as crude materials for extraction of dynamic fixings which utilized in the union of various medications. Like in the event of intestinal medicines, blood

thinners, anti-infection agents and antimalaria prescriptions, contain fixings from plants.^[2]

Calotropis is a genus of flowering plants in the family Apocynaceae, first described as a genus in 1810. *Calotropis procera* is a native plant of North Africa referred as a tropical plant growing of about 1050 meters. Particularly it prefers the warm climate so it's distributed is maximum in Rajasthan.^[3] *Calotropis procera* properly grows in dry and open habitat found along road-side, dry land of rural and urban region where soil is excessively drained and xerophytic conditions are available. It established very rapidly because it tolerates a high degree of abiotic stresses such as drought, salinity, temperature etc and dominating the arid zones where annual precipitation is very low.^[4] The number of ethanomedicinal uses of *calotropis* are mentioned in Ayurveda and popularly known as Raktha Arka. Traditionally it was used as an excellent substitute for ipecac, to treat cholera, elephantiasis diarrhea dysentery indigestion and used in extracting guinea worms.^[5]

Calotropis procera contained many biological active chemical groups including, cardenolides, steroids, tannins, glycosides, phenols, terpenoids, sugars, flavonoids, alkaloids and saponins. It exerted many

Cite this article: Chaman SM, Kappi M, Ahmed KKM. Global Research Productivity on *Calotropis* spp. over the last Decade (2011 - 2020): A Bibliometric Evaluation. Pharmacogn Res. 2021;13(3):113-20.

pharmacological effects such as antimicrobial, anthelmintic, anti-inflammatory, analgesic and antipyretic, anticancer activities. Traditionally it was used to treat cholera, extracting guinea worms and indigestion.^[6]

Calotropis procera is a well-known cure in Ayurvedic and conventional time for the treatment of a scope of sicknesses. The phytochemicals of this plant should be normalized to investigate its therapeutic qualities with the assistance of different strategies. Further exploration is important to explain the phytochemical also, pharmacological parts of this plant. The presence of a number of phytoconstituents and pharmacological activities of *Calotropis procera* is an expected hotspot for the turn of events of new medications to drug industry.^[4]

RELATED LITERATURE

Several studies have looked at publication patterns in the context of subject-wise research output.^[7] Bibliometric study conducted on the *Celastrus paniculatus* plant is presented based on selected quantitative and qualitative indicators, using Scopus international database during 2001-18 of global research output. The study analysed publication and citations, growth rate, citations impact, international collaborative papers, most productive countries, organizations, authors, journals and highly cited papers.^[8] Studied the Scientometric study on *Glycyrrhiza glabra* world research output using the Scopus database during 1997-2016. Study covers the growth rate, global share, citation impact, and international collaboration, distribution of publications and citation pattern and high cited papers.^[9] Conducted Quantitative and Qualitative study of Global Research on Terminalia arjuna Publications during 2004-2018 using Scopus database.^[10-15] Done various medicinal plant research publications assessment using the scientometrics / bibliometrics indicators. All the studies were used the Scopus database in various time durations.

OBJECTIVES

The main objectives of this study performance of *Calotropis* research output during the study period 2011 – 2020, based on publications output covered in Scopus database. In particular, the study focuses on the following objectives: (i) To study the growth of world research output in *Calotropis* research and its citation impact. (ii) To study the top 20 most productive countries (iii) To study the most productive subject areas. (iv) To study the highly productive organisations and citation impact. (v) To study the forms for communication. (vi) To study the top most productive authors and citation impact (vii) To identify the highly cited publications (viii) To study the most preferred sources (vii) To study the most used keywords.

METHODOLOGY

Scientific publications related to *Calotropis* released from 2011 to 2020, were retrieved from the Scopus®(<http://www.scopus.com>) in May 2021. Scopus is a global multidisciplinary database with larger coverage compared to other online platforms such as Web of Science and the Scientific Electronic Library Online. Currently, it covers about 15,000 international peer-reviewed journals in the field of science and technology data^[16] The study retrieved and downloaded ten years data of the world *Calotropis* research from the Scopus database during the study period 2011 – 2020. Keywords, such as “*Calotropis*” ALL (*Calotropis*) AND PUBYEAR > 2010 AND PUBYEAR < 2021. The search string was subsequently refined, using analytical functions and tags in Scopus database, by “year wise tag”, “country tag”, “source title tag”, “collaborating countries”, “author-wise”, “organisation-wise” and “keywords” etc. For citing data, citations to publications were also collected from data of publications till date 25 May 2021.

Main Information about Data

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2011:2020
Sources (Journals, Books, etc)	2055
Documents	6584
Average years from publication	4.6
Average citations per documents	13.33
Average citations per year per doc	2.347
References	1
DOCUMENT TYPES	
article	5512
article in press	2
book	25
book chapter	223
conference paper	150
conference review	1
data paper	3
editorial	11
erratum	2
letter	8
note	2
retracted	4
review	634
short survey	7
DOCUMENT CONTENTS	
Keywords Plus (ID)	32421
Author's Keywords (DE)	15434
AUTHORS	
Authors	21355
Author Appearances	31073
Authors of single-authored documents	234
Authors of multi-authored documents	21121
AUTHORS COLLABORATION	
Single-authored documents	263
Documents per Author	0.308
Authors per Document	3.24
Co-Authors per Documents	4.72
Collaboration Index	3.34

ANALYSIS

Annual Growth of World *Calotropis* research output

Table 2 and Figure 1 highlights the annual growth of world *Calotropis* research distribution of publications, mean TCPA and TCPY received for *Calotropis* research. Total of 6,584 papers were published, and is found that most productive year in terms of publication count is 2020 with 1194 publications and 1421 citations, followed by 961 publications with 13 citations received in 2019. Lowest citations were received in the year 2019, followed by, which were published during 2013. Lowest numbers of articles i.e. 433 were published in the year 2011. (Table 1)

Table 1: Year wise distribution of publications.

Year	Publications	TC	Mean TCPA	Mean TCPY
2011	433	189	22.42	2.24
2012	473	291	19.84	2.20
2013	475	139	20.31	2.54
2014	558	246	17.89	2.56
2015	527	250	15.99	2.67
2016	554	451	21.86	4.37
2017	697	502	14.52	3.63
2018	712	441	11.32	3.77
2019	961	13	6.90	3.45
2020	1194	1471	3.08	3.08

TC=Total Citations, TCPA= Total Citations per Article, TCPY= Total Citations per Year

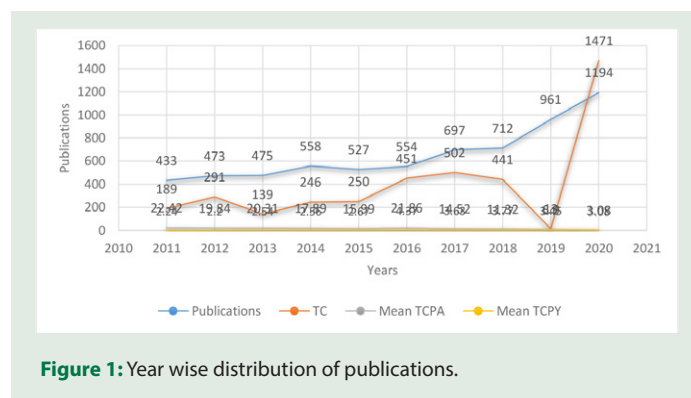


Figure 1: Year wise distribution of publications.

Top 20 most productive countries in *Calotropis* research

A total of 134 countries/ regions contributed to the 6584 publications during the period 2011 – 2020. The international share of articles^[17] is presented in the Table 2, which gives the country wise-distribution of contributions. Out of total 6584 research publications, India contributed the highest number of research articles contributing 2445 publications (TC-8255, HI: 105) with (37.13%) share, followed by China contributed 696 publications (TC-2816, HI:39) with (10.57%) share, Brazil contributed 556 publication (TC-1517, HI:30) with (8.44%) Pakistan contributed 479 publications (TC-1769, HI:39) with (7.25%) share, Saudi Arabia Contributed 399 publication (TC-1352, HI:29) with (6.06%) share. The table and Figure 2 shows the top 20 productive countries ones

Subject-Wise Distribution of Research output

Publication rates and citation behaviour can vary considerably from one research area to another, and this is the reason we usually discuss the performance of papers within the same research area.^[18] In this study, initially, we collected all the published research papers discussed here from the research field of *Calotropis* based on a broader scheme compressing 20 research areas out of 27. However, we have examined these *Calotropis* papers using the Scopus database. Table 3 shows the global *Calotropis* research output published during 2011 – 2020 is distributed across 20 sub-fields, with Agricultural and Biological Sciences according for the highest publications share (30.01%), followed by Pharmacology, Toxicology and Pharmaceutics (25.24%), Biochemistry, Genetics and Molecular Biology (23.26%), Medicine (18.33%), Chemistry (13.79%), Environmental Science (12.22%), Materials Science (11.92%) and

Table 2: Top 20 countries/regions in *Calotropis* research.

Name of the Country	Number of papers			Share of papers			TC	H index
	2011-2015	2016-2020	2011-2020	2011-2015	2016-2020	2011-2020		
India	1093	1352	2445	16.6	20.53	37.13	8255	105
China	157	539	696	2.38	8.18	10.57	2816	39
Brazil	203	353	556	3.08	5.34	8.44	1517	30
Pakistan	160	319	479	2.43	4.84	7.25	1769	39
Saudi Arabia	105	294	399	1.54	4.46	6.06	1352	29
Egypt	112	266	378	1.7	4.04	5.74	1083	28
United States	102	184	286	1.54	2.79	4.34	2105	39
Iran	66	199	265	1	3.02	4.02	1018	28
Malaysia	71	131	202	1.07	1.9	3.06	1080	31
South Korea	50	133	183	0.75	2.02	2.77	1504	38
Nigeria	77	102	179	1.16	1.54	2.71	1822	40
Indonesia	14	108	122	0.21	1.64	1.85	178	11
Bangladesh	78	41	119	1.18	0.62	3.02	246	19
Germany	34	75	109	0.51	1.13	1.65	647	25
South Africa	19	84	103	0.28	1.27	1.56	588	20
Italy	24	75	99	0.36	1.13	1.5	796	26
Australia	35	61	96	0.53	0.92	1.45	489	21
Japan	30	58	88	0.45	0.88	1.33	260	18
Thailand	20	66	86	0.3	1	1.3	442	19
Turkey	33	51	84	0.5	0.77	1.27	225	17
Total	2483	4491	6974	37.57	68.02	107.02	28192	

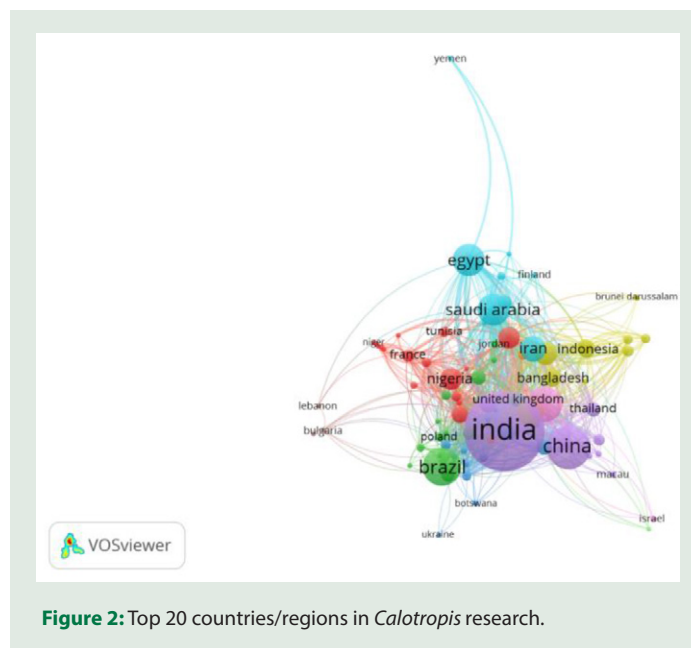


Figure 2: Top 20 countries/regions in *Calotropis* research.

remaining all sub fields have below 10% publications share. Biochemistry, Genetics and Molecular Biology among various subjects registered the highest citations impact per paper of 23.26 ACP with 6352 citations, followed by Chemistry 13.79 ACP with 5254 Citations, and lowest citations from nursing subject with 83 citations during the period of study Table 3.

Table 3: Subject-wise distribution of *Calotropis* research.

SN	Subject	TP	TC	ACP
1	Agricultural and Biological Sciences	1976	4694	30.01
2	Pharmacology, Toxicology and Pharmaceutics	1662	4723	25.24
3	Biochemistry, Genetics and Molecular Biology	1532	6352	23.26
4	Medicine	1207	3803	18.33
5	Chemistry	908	5254	13.79
6	Environmental Science	805	3264	12.22
7	Materials Science	785	4078	11.92
8	Engineering	586	2709	8.90
9	Chemical Engineering	584	3285	8.86
10	Immunology and Microbiology	417	2185	6.33
11	Physics and Astronomy	354	4198	5.37
12	Energy	190	3087	2.88
13	Multidisciplinary	157	2932	2.38
14	Veterinary	138	2290	2.09
15	Earth and Planetary Sciences	109	2362	1.65
16	Economics, Econometrics and Finance	69	2513	1.04
17	Computer Science	61	2337	0.92
18	Health Professions	55	768	0.83
19	Social Sciences	44	60	0.66
20	Nursing	38	83	0.57

Table 4: Characteristics of the top 20 organisations in *Calotropis*.

SN	Name of the Organisation	Country	TP	TC	ACP	H index
1	King Saud University	Saudi Arabia	163	582	28.000	23
2	Universidade Federal do Ceara	Brazil	106	297	35.69	20
3	King Abdulaziz University	Saudi Arabia	96	313	30.67	16
4	Ministry of Education China	China	93	369	25.20	16
5	Chinese Academy of Sciences	China	87	426	20.42	20
6	Quaid-i-Azam University	Pakistan	73	410	17.80	23
7	Vellore Institute of Technology	India	70	290	24.13	18
8	University of Agriculture, Faisalabad	Pakistan	66	159	41.50	18
9	King Saud University College of Science	Saudi Arabia	64	321	19.93	18
10	National Research Centre	Egypt	63	119	52.94	13
11	Universidade Federal Rural de Pernambuco	Brazil	52	97	53.60	12
12	Government College University Faisalabad	Pakistan	52	208	25	16
13	University of the Punjab, Lahore	Pakistan	51	272	18.75	14
14	Universidade de Sao Paulo - USP	Brazil	50	172	29.06	16
15	Assiut University	Egypt	48	133	36.09	13
16	Annamalai University	India	47	192	24.47	15
17	Universidade Federal Rural do Semi-Arido	Brazil	47	61	77.04	8
18	Al-Azhar University	Egypt	44	114	38.59	11
19	Bharathiar University	India	44	177	24.85	17
20	King Saud University College of Pharmacy	Saudi Arabia	43	83	51.80	9

Top 20 most productive global organisations

We have identified 168 organisations and the 20 most productive ones are shown in Table 4 and Figure 3, including 4 from Saudi Arabia, Brazil, Pakistan, 3 from India, Egypt and 2 from China. The large portion of Saudi Arabia organisations, 4 out of 20, indicates the country’s leading role in high-level scientific research in *Calotropis*. There are only 5 organisations from the other top 15 countries suggesting that the *Calotropis* researches conducted worldwide are relatively concentrated in several top organisations. King Saud University, Saudi Arabia is the most productive organisation which contributed 163 (28.00%) publications with the highest citations, Universidade Federal do Ceara, Brazil ranks the second with 106 (35.69%) publications and 297 citations, followed by King Abdulaziz University, Saudi Arabia produced 96 (30.67%) publication with 313 citations, Ministry of Education China produced 93 (25.20%) publications with 369 citations.

Further analysis shows that there are 148 organisations owning at least 90 publications and Figure 3 gives their collaboration network.

Medium of Research communication

Table 5 shows that 83.72% (5512) global publications on *Calotropis* publications appeared in articles and the rest as Reviews 634 (9.63%), Book Chapters 223 (3.39%), Conference papers 150 (2.28%), Books 25 (0.38%), Editorials 11 (0.17%), remaining all below 10 papers each share their papers.

Top 20 most productive authors

The research productivity in the field of *Calotropis* research of top 20 most productive authors varied from 25.25% (420) global publication share and 40% (1663) citations share during 2011 – 2020. Table 3 six author’s registered publications output above the group average of 2.96:

TP: Total Paper, TC: Total Citation, ACP: Average citations per paper, HI: *h*-Index.

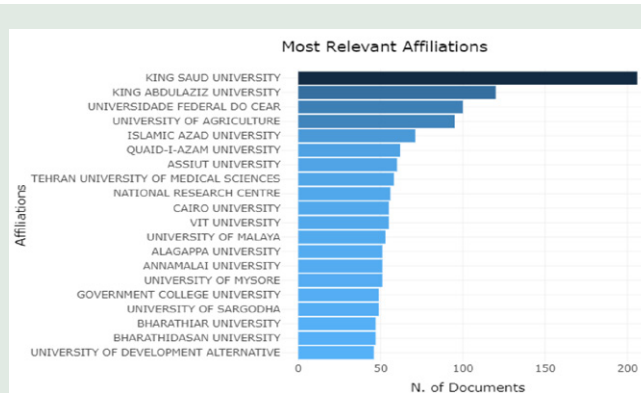


Figure 3: Top 20 most productive Institutions/organisations in *Calotropis* research.

Ramos, Márcio Viana published 63 (0.95%) papers, 188 citations with 16 *h*-index, followed by Rahmatullah, Mohammed published 39 (0.59%) papers, 25 citations with 8 *h*-index, Freitas, C.D.T. published 26 (0.39%) papers 95 citations with 10-*h* index, Neto, Francisco Bezerra published 25 (0.37%) papers, 35 citations with 8 *h*-index, Ayodhya, Dasari,

Nagabhushana, H., published 21 (0.31%) papers, Sharma, S. C., Veerabhadram, Guttena, Zheng, Yian ,published 19 (0.28%) papers (Figure 4).

Highly cited papers

Highly cited papers are important to the reputations of the university.^[19] Table 7 and Figure 5 shows the highly cited papers published in the field of *Calotropis* research publication published in different journals. Most of the papers/authors from Agricultural and Biological Sciences and Pharmacology, Toxicology and Pharmaceutics filed. Interestingly, all the highly cited papers are published in journals and the papers that have received 357 citations and these papers received 9180 (3.88%) of all

Table 5: Medium of research communication in *Calotropis*.

SN	Document type	TP	6584%
1	Article	5512	83.72
2	Review	634	9.63
3	Book Chapter	223	3.39
4	Conference Paper	150	2.28
5	Book	25	0.38
6	Editorial	11	0.17
7	Letter	8	0.12
8	Short Survey	7	0.11
9	Retracted	4	0.06
10	Data Paper	3	0.05
11	Erratum	2	0.03
12	Note	2	0.03
13	Conference Review	1	0.02
14	Undefined	2	0.03
		6584	100.00

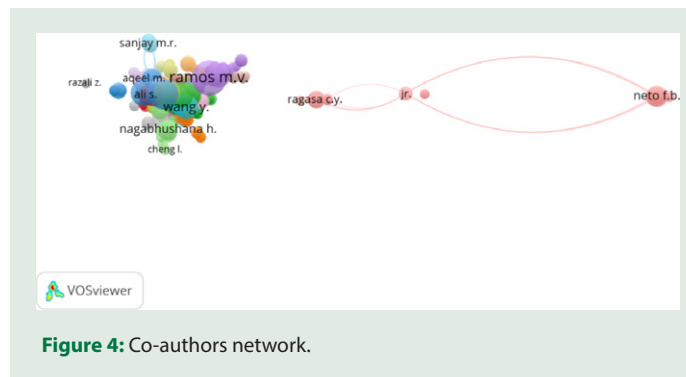


Table 6: Top 20 most productive and most impactful authors in *Calotropis* research during 2011 – 2020.

SN	Author	Author Affiliation	TP	ACP	TC	ACP	HI
1	Ramos, Márcio Viana	Universidade Federal do Ceara, Fortaleza, Brazil	63	0.95	188	0.95	16
2	Rahmatullah, Mohammed	University of Development Alternative, Dhaka, Bangladesh	39	0.59	25	0.59	8
3	Freitas, C.D.T.	Universidade Federal do Ceara, Fortaleza, Brazil	26	0.39	95	0.39	10
4	Neto, Francisco Bezerra	Universidade Federal Rural do Semi-Arido, Mossoro, Brazil	25	0.37	35	0.37	8
5	Ayodhya, Dasari	Osmania University, Hyderabad, India	21	0.31	103	0.31	10
6	Nagabhushana, H.	Tumkur University, Tumkur, India	21	0.31	121	0.31	14
7	Sharma, S. C.	Indian Institute of Technology Guwahati, Guwahati, India	19	0.28	98	0.28	13
8	Veerabhadram, Guttena	Osmania University, Hyderabad, India	19	0.28	98	0.28	9
9	Zheng, Yian	Lanzhou University, Lanzhou, China	19	0.28	119	0.28	11
10	Mukhtar, Tariq	PMAS-Arid Agriculture Univerity Rawalpindi, Pakistan	16	0.24	115	0.24	16
11	Murugan, Kadarkarai	Bharathiar University, Coimbatore, India	16	0.24	122	0.24	13
12	Shinwari, Zabta Khan	Quaid-i-Azam University, Islamabad, Pakistan	16	0.24	95	0.24	9
13	Ullah, Riaz	King Saud University College of Pharmacy, Riyadh, Saudi Arabia	16	0.24	50	0.24	7
14	Anantharaju, K. S.	Dayananda Sagar College of Engineering, Bengaluru, India	15	0.22	71	0.22	11
15	Diederich, Marc	Seoul National University, Seoul, South Korea	15	0.22	110	0.22	12
16	Maaza, Maalik M.	University of South Africa, Pretoria, South Africa	15	0.22	152	0.22	9
17	Mohamed, Gamal Abdalla	Al-Azhar University, Nasr City, Egypt	15	0.22	20	0.22	6
18	Ragasa, CY	De La Salle University-Manila, Manila, Philippines	15	0.22	22	0.22	7
19	Shen, Chienchiang	NRI of Chinese Medical Taiwan	15	0.22	17	0.22	6
20	Comi, Giancarlo	Univ Vita Salute San Raffaele, San Raffaele Sci Inst, Milan, Italy	14	0.21	20	0.21	6

TP – total papers; TC – total citations; ACP – average citation per papers; HI - *h*-index

citations. The total number of citations comes from the Scopus database, which shows the total number of times a particular article has been cited by the journals listed in Scopus database. Among highly cited papers, the largest participation was seen from India (4 Papers), followed by China (2 papers), Morocco, US, Italy 1 papers each. “Methods for *in vitro* evaluating antimicrobial activity: A review” by Balouiri, M., Sadiki, M., Ibsouda, S.K. is most cited 1679 citations published in the *journal of Pharmaceutical Analysis* of followed by “Chemistry and biological activities of flavonoids: An overview” by Kumar, S., Pandey, A.K. with 1427 citations published *The Scientific World Journal*, “Seeds: Ecology, biogeography, and, evolution of dormancy and germination” by Baskin, C.C., Baskin, J.M with 1131 citations published in *Seeds: Ecology, Biogeography, and Evolution of Dormancy and Germination*, “Cu and Cu-Based Nanoparticles: Synthesis and Applications in Catalysis” by Gawande, M.B., Goswami, A., Felipin, F.-X., (...), Zboril, R., Varma, R.S. 1104 citations published in *Chemical Reviews*, “A review on plants extract

mediated synthesis of silver nanoparticles for antimicrobial applications: A green expertise” by Ahmed, S., Ahmad, M., Swami, B.L., Ikram, S. with 1091 citations published in *Journal of Advanced Research*. “Synthesis of metallic nanoparticles using plant extracts” by Mittal, A.K., Chisti, Y., Banerjee, U.C. with 1081 citations, published in *Biotechnology Advance*.

Preferred Journals

In this study, 160 journals were conformed to publish 6584 *Calotropis* research. Out of the 160 journals, 105 (1.59%) and 103 (1.56%) shared only two of those *Calotropis* research, and 5 journals (3.84%) share,

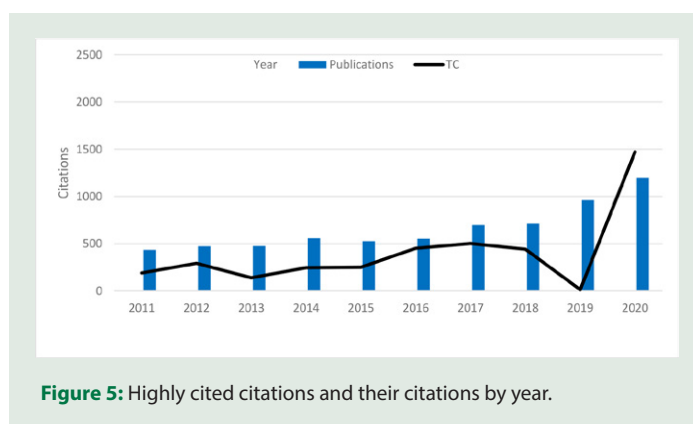


Figure 5: Highly cited citations and their citations by year.

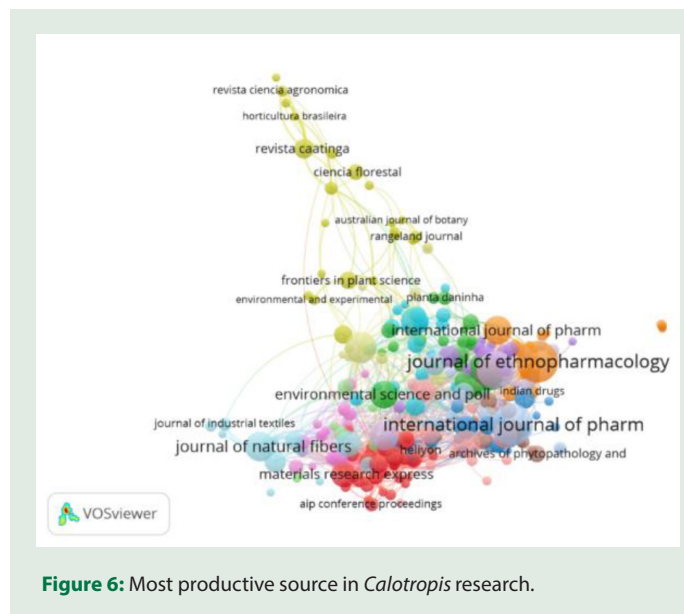


Figure 6: Most productive source in *Calotropis* research.

Table 7: Top 20 most productive source in *Calotropis* research.

SN	Source	TP	6584%	TC	h_index	g_index	m_index	PY_start
1	Journal Of Ethnopharmacology	105	1.59	3047	34	47	3.09	2011
2	International Journal Of Pharmacy And Pharmaceutical Sciences	103	1.56	831	13	23	1.18	2011
3	Asian Journal Of Pharmaceutical And Clinical Research	88	1.33	349	10	14	0.91	2011
4	International Journal Of Biological Macromolecules	61	0.92	943	17	28	1.55	2011
5	Research Journal Of Pharmacy And Technology	53	0.8	95	4	7	0.36	2011
6	Journal Of Natural Fibers	52	0.79	281	10	14	1.25	2014
7	International Journal Of Pharma And Bio Sciences	51	0.77	218	9	12	0.82	2011
8	International Journal Of Pharmaceutical Sciences Review And Research	48	0.72	211	8	12	0.73	2011
9	Pakistan Journal Of Botany	48	0.72	442	13	19	1.18	2011
10	Asian Pacific Journal Of Tropical Biomedicine	47	0.71	968	17	29	1.55	2011
11	Environmental Science And Pollution Research	47	0.71	950	16	29	1.45	2011
12	Industrial Crops And Products	41	0.62	1029	16	31	1.78	2013
13	Journal Of Applied Pharmaceutical Science	41	0.62	158	7	9	0.64	2011
14	Materials Research Express	38	0.48	339	12	16	1.71	2015
15	Evidence-Based Complementary And Alternative Medicine	37	0.56	809	14	28	1.27	2011
16	Plant Archives	34	0.51	26	3	3	0.27	2011
17	Molecules	32	0.48	625	13	24	1.18	2011
18	Parasitology Research	32	0.48	1395	23	32	2.09	2011
19	Plos One	31	0.47	455	14	19	1.40	2012
20	Scientific Reports	31	0.47	403	12	19	1.50	2014

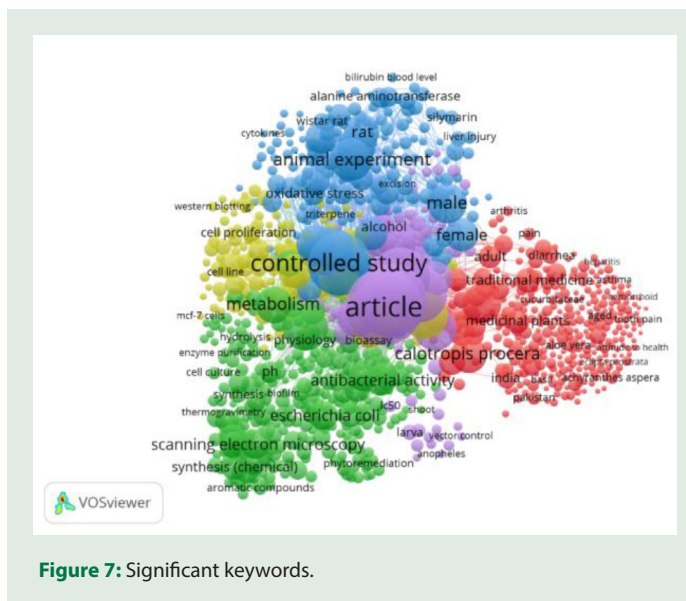


Figure 7: Significant keywords.

while 15 journals (7.55%) share. *Journal Of Ethnopharmacology* was the most productive journal with 105 *Calotropis* research accounting for 1.59%, followed closely by *International Journal of Pharmacy and Pharmaceutical Sciences* with 103 (1.56%) both of which are the top journals in the category. The third most productive journal is *Asian Journal of Pharmaceutical and Clinical Research* with 88 (1.33%), Table 7 and Figure 5 provides bibliometric details of the journal with highly cited articles (articles with 3074 citations) with 34 *h*-index among the list; this retrieves the excellence of the journal^[20] and out of the 6584 papers, 1020 (14.54%) appears in the top 20 list.

Significant Keywords

Around 168 significant keywords have been identified from the literature which throughout on the research trends in *Calotropis* research. Including on its Agricultural and Biological Sciences, Pharmacology, Toxicology and Pharmaceutics, Biochemistry, Genetics, and Molecular Biology and Medicine uses. These keywords are listed in Table in the decreasing orders of the frequency of their occurrence in the literature during the study period 2011 – 2020.

SUMMARY AND CONCLUSION

Our analysis is based exclusively on the literature retrieved from Scopus in May 2021. And is solely based on the keywords appeared in the fields of the publications. The citation Figures may also vary across these databases. The findings of this study must hence be interpreted cautiously considering continues evaluation of research evidence on the topic. Among the different bibliometric approaches, we have used fractional counting to give equal weightage to the entities involved in research articles. Though equal weightage is an advantage of this approach. In this study, we have solely used the citation numbers for identifying influential articles, though we acknowledge that a normalized score citations using the journals impact factor and age of articles would have provided a different results.

We have preferred a bibliometric analysis of the global *Calotropis* literature published during the study period 2011 – 2020, as indexed in Scopus (as of May 2021). The study considered a total of 6,584 publications having 3,993 citations. Analysis was done using bibliometric parameters with Biblioshny and networks were visualized using VOSviewer.

An increasing trend of publication growth and their corresponding citations over time signify the importance of this research topic.^[21,22] Among the leading countries India, China, Saudi Arabia, and Brazil dominated by the Institutions like King Saud University, Saudi Arabia, Universidade Federal do Ceara, Brazil, Ministry of Education China, China, Vellore Institute of Technology,

This study identifies prolific researchers, profound journals, predominating countries/institutions, forms for communicating, highly cited publications, significant keywords. The findings can act as a ready reference for researchers and serve them with useful information to formulate strategies for future studies. Researchers may find their peers and funding bodies could identify the targeted authors/institutions for possible investments.

ACKNOWLEDGEMENT

Nil

Financial support and Sponsorship

Nil.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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Cite this article: Chaman SM, Kappi M, Ahmed KKM. Global Research Productivity on *Calotropic* sps. over the last Decade (2011 - 2020): A Bibliometric Evaluation. *Pharmacog Res.* 2021;13(3):113-20.