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Dr. M Sankar
Deputy Librarian, Tamil Nadu
Agricultural University,
Agricultural College & Research
Institute, Vazhavachanur,
Thiruvannamalai, Tamil Nadu,
India

Dr. P Senthilkumar
Assistant Professor (Plant
Nematology), Tamil Nadu
Agricultural University,
Agricultural College & Research
Institute, Vazhavachanur,
Thiruvannamalai, Tamil Nadu,
India

Corresponding Author:
Dr. M Sankar
Deputy Librarian, TamilNadu
Agricultural University,
Agricultural College & Research
Institute, Vazhavachanur,
Thiruvannamalai, Tamil Nadu,
India

Research output of Plant Pathology through Web of Science: A Scientometric Study

Dr. M Sankar and Dr. P Senthilkumar

Abstract

Plant Pathology is very important subject field in Agriculture. The research output by Plant pathology scientists was retrieved from the Web of Science database for the period 2001 to 2022 and analyzed. The findings of the study revealed that 3262 records were published in the Plant Pathology field scientists. The paper briefly discusses research out in different categories such as year wise output, source wise, topmost ranking for journals, institution, and keyword. The total involved the Authors: 14138, Journals: 1269, Cited References: 178176, Words: 8701. The highest number of publications made by researchers was 357 in the year 2021.

Keywords: Web of Science, research output, Plant Pathology

Introduction

Plant pathology is a study of Plant diseases and its symptoms briefly described pathogen characters and its life cycle. Plant pathology gives detail information about management of plant diseases. It contains virus, fungi, bacteria, phytoplasma and mycoplasma. Research metrics is very much popular and the useful for particular societies in the further applied oriented sectors. Presently, several funding agencies are screening/evaluating the research proposal based on scientist and institution research background. The research output and its impact by the scientist and institution are also contributing a significant role in project approval by funding agencies. The present study is focused on Plant pathology research output by the researchers from different institutions and research groups, and their research impact was analyzed based on the data collected from Web of Science, and results are presented.

Web of Science database

Web of Science Database one of the renowned database in the Scholarly publication information. The data available period of years 1900 to till present date. Now a day the database is maintained by Clarivate Analytics. The depth was focused on the citation indexing, author based, topic related title, using the subject keywords, abstract, the journal title search, an authored details and publications year. It displays the Science, Social Sciences, Arts and Humanities including 256 disciplines. The format is full text articles, reviews, editorials, abstracts, proceedings and technical papers. There are 90 million of records are available in the database of scientific citation search.

Review of Related Literature

Sankar, M (2020) [2] analyzed the research output of plant science in Tamil Nadu Agricultural University from 2000 to 2020 using Web of Sciences. He reported that the highest number of publications output 49 was in the year 2015 for the TNAU scientist's research output was in the form of research papers in (83.01%). The topmost journal preferred to publish was Plant archives, and it accounts for 30 papers. The most prolific author was Samiyappan R, and he published 45 articles in different journals. For institutional collaboration with Kansas State University for 28 articles in the first rank. The rice was the highest frequency keyword for the plant science category (97 times).

Senthilkumar and Sankar, (2022) [3] analysed the Scientometric analysis of Plant Nematology research output of Global context based research. It indicates the qualitative and quantitative analysis description and techniques which has been applied. The study period has twenty years from the year 2002 to 2021. The plant nematology research extracted the Web of Science database which has been taken for the analysis and also to motivate the future researches in Plant nematological aspects

Objectives of the study

- To identify the year-wise research output of Plant Pathology scientists.
- To identify the source wise distribution in India in the Plant Pathology research output.
- To identify the frequency of topmost journal distribution in Plant Pathology research output.
- To identify the frequency of institution wise in India Plant Pathology research out.

- To identify the frequency of country wise in India Plant Pathology research out.
- To identify the topmost keyword for the Plant Pathology research area.

Methodology

Web of Science is a scientific and indexing service available online, which is maintained by Thomson Reuters. In order to fulfill the objectives of the present study, the data was collected from this online citation indexing database and analyzed. In this study, the Web of Science was used for data collected online from 2000 to 2019. The search string was the "Plant Pathology" topic in the Web of Science was used and retrieved in April month. Further, the other subjects were excluded from the collected data and limited to Plant Pathology subject records. Finally, all the downloaded data were analyzed through histcite software.

Table 1: Plant pathology research year wise research output and total citation scores

Sl.No	Publication Year	Recs	TLCS	TGCS
1	2001	2	0	26
2	2002	47	13	3986
3	2003	60	41	2204
4	2004	74	89	2931
5	2005	76	67	3582
6	2006	103	82	3134
7	2007	110	95	4294
8	2008	115	71	4046
9	2009	128	85	5414
10	2010	133	93	6211
11	2011	144	115	4273
12	2012	143	138	7323
13	2013	158	68	6002
14	2014	165	73	4677
15	2015	163	60	4438
16	2016	168	51	4101
17	2017	221	51	4369
18	2018	249	53	3989
19	2019	229	33	2591
20	2020	322	28	2581
21	2021	357	8	657
22	2022	74	2	25
23	Unknown	21	0	31

Table 1 shows year wise research output and total citation scores at the global level for the Plant Pathology field. For the study period, a total of 3262 research documents were published in Plant Pathology research by various scientists from different academic and research institutes in around the world. The highest and lowest number of publications for the

year 2021 has 357, and 2 for in the year of 2001 observed. It is interesting to note that more than 100 publication records found in the Plant Pathology field as a yearly research output in India for the period starting from 2006 to 2021. The remarkable Total Local Citation Score (TLCS) and Total Global Citation Scores (TGCS) found in the above table.

Table 2: Document wise research output and total citation scores in the Plant Pathology

	Document Type	Recs	TLCS	TGCS
1	Article	2082	688	37912
2	Review	695	381	34704
3	Proceedings Paper	122	3	204
4	Meeting Abstract	101	2	4
5	Editorial Material	79	35	1066
6	Article; Proceedings Paper	76	116	3904
7	Review; Book Chapter	51	77	2603
8	Review; Early Access	14	0	29
9	Article; Early Access	7	0	2
10	Biographical-Item	7	0	43
11	News Item	6	5	107
12	Correction	5	3	105

13	Letter	5	4	132
14	Book Review	4	0	0
15	Article; Book Chapter	3	1	55
16	Article; Retracted Publication	1	0	11
17	Bibliography	1	0	1
18	Biographical-Item; Book Chapter	1	1	3
19	Editorial Material; Book Chapter	1	0	0
20	Reprint	1	0	0

The research documents published in the Plant Pathology field by scientists the study period from 2001 to 2022 Plant Pathology research works were published by scientists in different kinds of research documents such as article, review, proceedings paper, Meeting abstract and other different

documents. It is evidenced that significant contribution was by research articles published in different journals (2082), review (695) and followed by proceedings paper (122), Meeting Abstract (101) and other documents.

Table 3: Top 25 journals preferred by Scientists to publish Plant Pathology research.

Sl. No	Name of the journal	Records	TLCS	TGCS
1	Phytopathology	187	142	1753
2	Journal of ethnopharmacology	60	18	1380
3	Mycotaxon	58	15	347
4	Pesquisa veterinaria brasileira	58	108	681
5	Mycological research	36	21	1082
6	European journal of plant pathology	35	30	1036
7	Australasian plant pathology	34	8	177
8	Journal of plant pathology	33	15	374
9	Molecular plant pathology	33	124	5997
10	Phytobiomes journal	33	8	238
11	Plant pathology	30	14	383
12	International journal of molecular sciences	29	0	653
13	Plos one	28	0	1120
14	Molecules	27	1	807
15	Scientific reports	27	0	490
16	Plant disease	25	30	274
17	Evidence-based complementary and alternative medicine	22	0	449
18	Frontiers in plant science	22	0	314
19	Canadian journal of plant pathology	21	2	209
20	Nutrients	20	0	253
21	Tropical plant pathology	20	7	120
22	Frontiers in pharmacology	18	0	431
23	Annual review of phytopathology	17	49	2175
24	EFSA journal	17	0	21
25	Food and chemical toxicology	17	7	708

The details of the top 25 journals preferred by researchers to publish their Plant Pathology research works during the study period are presented in table 3. The analyzed results show that the top 2 journals are PHYTOPATHOLOGY (187 nos.) and

JOURNAL OF ETHNOPHARMACOLOGY (60 nos.). These two journals were NAAS rating for the year 2023 of more than 6.00.

Table 4: Frequency of Institution wise in Plant Pathology research output (Top 25)

Sl.No	Name of the Institution	Records	TLCS	TGCS
1	Shandong Agr Univ, Dept Plant Pathol	50	9	199
2	Univ Calif Davis, Dept Plant Pathol	30	58	1730
3	Oregon State Univ, Dept Bot & Plant Pathol	26	60	1492
4	Univ Fed Vicoso, Dept Fitopatol	23	11	224
5	Univ Georgia, Dept Plant Pathol	23	41	424
6	ARS, USDA	20	15	1090
7	Kansas State Univ, Dept Plant Pathol	15	48	466
8	Ohio State Univ, Dept Plant Pathol	15	24	355
9	Univ Florida, Dept Plant Pathol	15	40	800
10	CBS KNAW Fungal Biodivers Ctr	13	40	1143
11	Texas A&M Univ, Dept Plant Pathol & Microbiol	13	24	885
12	USDA ARS	13	8	408
13	N Carolina State Univ, Dept Plant Pathol	12	52	2229
14	Penn State Univ, Dept Plant Pathol & Environm Microbiol	12	2	146
15	Cornell Univ, Sch Integrat Plant Sci	11	10	164
16	Univ Calif Berkeley, Dept Environm Sci Policy & Management	11	33	804
17	Univ Fed Santa Maria, Dept Patol	11	36	243

18	Australian Natl Univ, Res Sch Biol	9	5	208
19	Guizhou Univ, Dept Plant Pathol	9	3	49
20	Key Lab Agr Microbiol, Tai An 271018	9	1	22
21	Mae Fah Luang Univ, Ctr Excellence Fungal Res	9	13	134
22	Mae Fah Luang Univ, Sch Sci	9	24	688
23	Shandong Agr Univ, Coll Plant Protect	9	2	50
24	Univ Pretoria, FABI	9	17	429
25	Shandong Agr Univ, Dept Plant Pathol	50	9	199

Based on research output, details of institutions ranked based on their performance in the field of Plant Pathology are given table 4. For the study period, the first place was Shandong Agr Univ, Dept Plant Pathol with 50 articles, and TGCS

Score was 199. The Univ Calif Davis, Dept Plant Pathol has ranking second place with 30 records and TGCS 1730. Third place for the Oregon State Univ, Dept Bot & Plant Pathol by 26 published records with 1492 numbers for TGCS.

Table 5: Frequency of Country wise in Plant Pathology research output (Top 25)

Sl.No	Country	Records	TLCS	TGCS
1	USA	811	563	27992
2	Brazil	314	211	6883
3	Peoples R China	311	91	5370
4	Italy	282	105	9179
5	UK	234	281	14168
6	France	191	128	9504
7	Spain	186	81	6936
8	Australia	185	157	7524
9	India	172	64	4570
10	Germany	142	114	6924
11	Canada	130	71	3634
12	Unknown	105	12	925
13	Japan	76	48	4595
14	South Africa	74	77	3255
15	South Korea	74	29	1964
16	Netherlands	72	112	6234
17	Iran	58	17	1499
18	Pakistan	58	8	885
19	Poland	51	11	974
20	Switzerland	51	78	3189
21	Belgium	49	46	2678
22	Portugal	47	25	1804
23	Argentina	46	12	862
24	Mexico	46	1	962
25	Russia	45	6	541

Based on country wise research output, details of ranked based on their performance in the field of Plant Pathology are given table 5. For the study period, the first place USA I with 811 articles, and TGCS Score was 27992. The Brazil has

ranking second place with 314 records and TGCS 6883. Third place for the Peoples R China by 311 published records with 5370 and India got 9 position 172 numbers for TGCS 4570.

Table 6: The frequency of keyword wise in Plant Pathology research output (Top 25)

Sl.No	Keywords	Records	TLCS	TGCS
1	Plant	704	528	19127
2	Pathology	419	345	10345
3	Disease	303	159	8042
4	Effects	150	42	3461
5	New	148	46	3129
6	Species	141	55	2129
7	Induced	134	32	3048
8	Potential	131	19	2561
9	Plants	130	47	3889
10	Analysis	124	120	3131
11	Diseases	114	34	2785
12	Based	102	55	1662
13	Molecular	102	138	7024
14	Effect	99	21	1763
15	Pathogen	98	101	3256
16	Using	97	49	1868
17	Pathogens	94	142	5846
18	Human	93	20	4434
19	Extract	89	8	1122

20	Review	88	32	2666
21	Fungal	87	71	3769
22	Model	87	21	2361
23	Activity	83	12	1929
24	Rats	81	17	1308
25	Virus	80	24	1738

From above table represents, it is interesting to note that 8701 keywords found in the results of the Plant Pathology research in India. Among the keywords, “PLANT” 704 times occurred, “PATHOLOGY” has 419 times, “DISEASE” has 303 times and EFFECTS 150 times appeared in the data on research output. The highest Global citation scores for the keyword search was “PLANT” for 19127 times. “PATHOLOGY” for 10345 times only.

Conclusion

Plant Pathology research output in India has shown significant publications made in terms of twenty different types of research documents that appeared in data retrieved from the Web of Science. Phytopathology is one of the major Journal of Publication of Plant Pathology research and found that study period (2001 to 2022), Shandong Agricultural University, China has Highest records produced the institution.

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