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Citation Analysis of Indian Journal of Nematology: A Study

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Abstract: The present study aims to examine the citation pattern of the Indian Journal of Nematology using bibliometric and citation analysis techniques. Citation analysis is an important method of evaluating the use of scholarly information and understanding the research communication patterns of a particular subject field. The study focuses on 266 articles published in the Indian Journal of Nematology during the period 2014-2023. The data were collected from the journal and analysed using quantitative techniques such as frequency and percentage. The study examines the volume-wise and issue-wise distribution of citations, category-wise distribution of articles by content, document types cited, electronic and print citations, authorship patterns, Indian and foreign sources, and language-wise distribution of citations. The findings are expected to reveal researchers' preferences for different information sources and their citation behaviour in the field of nematology. The study will also provide insights into the nature and use of scholarly literature and help understand the information requirements of researchers in this subject area.

Keywords: Citation Analysis, Indian Journal of Nematology, Citation Pattern, Authorship Pattern, Document Type.

Introduction

Citation analysis is an important bibliometric technique used to study researchers' information-use patterns and scholarly communication. It helps identify the types of documents cited, authorship patterns, preferred sources, and languages of publications.

The Indian Journal of Nematology publishes research related to nematodes and their importance in agriculture and plant protection. Analysing the citations in this journal helps understand the information sources used by researchers in the field of nematology.

The present study examines the citation patterns of the journal by analysing volume-wise and issue-wise citations, article categories, document types, electronic and print citations, authorship patterns, Indian and foreign sources, and language-wise distribution. The study aims to understand the research and information-use trends reflected in the journal.

Brief History of Indian Journal of Nematology

The Indian journal of Nematology is published half - yearly by the Nematological society of India. The journal is sent free to members in good standing. Indian Journal of Nematology is published by the Nematological Society of India, which is located at the Division of Nematology, Indian Agricultural Research Institute (I.A.R.I.), and New Delhi-110012. It has been continuously published since **1971** and is **a bi-annual** publication of the Society committed to promoting the growth and development of the science of Nematology.

In addition to the research articles, the journal publishes Nematological news, Book/Journal Reviews, and Obituaries. Even though most of the papers published in the journal are from the Indian sub-continent, a few papers from other countries have also been published. The span of 10 years was taken 4.3.1 to 4.3.16 in the tables followingly.

Review of Litrature

Ramesh Kuri & VenugopalHajje (2014) this study analyses the citations cited in the "Pearl" Journal during 2009-2011. This analysis has been taken through the various analysis techniques such as Authorship pattern, Domain wise distribution of citations, Age of citations, most prominent journals cited and different sources of citations etc. At the end the study is concluded with some recommendations

Garg ,K. C. & Bebi (2014) The studies the analysis of the number of articles published in Annals of Library and Information Studies (ALIS) and DESIDOC Journal of Library and Information Technology (DJLIT) during 2010-2013 and the citations obtained by these articles during 2010-2014 (April) using Google. The study develops immediacy index and impact factor of the two journals, besides, identifying the highly cited authors/papers. Findings reveal that DJLIT published more papers than ALIS and also received more citations. However, citation per paper for both the journals is almost equal. DJLIT have a better immediacy index than ALIS. Impact factor of both the journals was less than one in 2012; however, it increased in 2013 and was more than one in 2013.

Das and Sen (2001) analyzed 1049 citations appended to 34 research articles of *Journal of Biosciences*; 2000. It was found that out of the total citation, journal articles comprises 85.89% and monographs 10.1%.Deshmukh (2011)2 this studies the Analysis of 4141 citations appended to articles in volumes 44 to 57 of Annals of Library and Information Studies shows that the source journal is the most cited. The half-life of LIS literature is found to be 9 years for journals and 14 years for books respectively. The core periodicals as per the 4141 citations have been listed according to the productivity.

Objective of the Study

1. To examine the volume-wise distribution of citations.
2. To examine the issue-wise distribution of citations.
3. To analyze the category-wise distribution of articles by content.
4. To examine the distribution of cited documents by document type.

5. To examine the distribution of E-citations and P-citations.
6. To examine the authorship patterns of cited documents.
7. To examine the distribution of cited documents by Indian and foreign sources.
8. To analyze the language-wise distribution of citations.

Hypothesis of the Study: The following hypotheses are formulated for the present study

1. Single authors are most productive than multi authors.
2. Researchers depend more on journal literature for their research
3. English language is a pre-dominant language.
4. Maximum number of contribution are from foreign countries.

Scope and Limitation of the Study

The data for the present study was collected from the Indian Journal of Nematology, accessed through the INFLIBNET N-LIST database. A total of 266 research articles published during the period 2014–2023 were selected for the study.

Research Methodology

The present study adopts the bibliometric and citation analysis method. Data were collected from 266 articles published in the Indian Journal of Nematology during 2014–2023 through the INFLIBNET N-LIST database.

Data Analysis

The study analyzes 266 articles containing 5662 citations published in the Indian Journal of Nematology during 2014–2023. The collected data are classified according to volume-wise, issue-wise, content category, document type, citation format, authorship pattern, geographical distribution, and language. The collected data analysed as per the objective laid down as well as by using various statistical tools.

According to the objective of the study, analysis & findings of the study are outline below:

1. VOLUME WISE DISTRIBUTION OF CITATIONS PER ARTICLE

The volume wise distribution of citations per article of "The Indian journal of Nematology" of 10 volumes was considered for the present study from the year 2014-2023.

Table No .1 Volume Wise Distribution of Citation per Article

Sr. No.	Volume Number	Year	No. of Articles	No. of Citations	Average Citation Per Article in %
1	44	2014	33	518	9.15
2	45	2015	31	584	10.31
3	46	2016	18	253	4.47
4	47	2017	33	668	11.80
5	48	2018	32	652	11.52
6	49	2019	25	513	9.06
7	50	2020	17	342	6.04
8	51	2021	26	609	10.76
9	52	2022	31	889	15.70
10	53	2023	20	634	11.20
		Total	**266**	**5662**	**100.00**

Table No. 1, indicates that the total number of articles published during 2014 - 2023. Were 266 and the total number of citations were 5662. Year wise analysis of citations shows that average number of per article is maximum (15.70%) in the year 2022 and it also seen minimum (4.47%) in the year 2016. The present study reveals that average number of citations per article is increasing.

2. ISSUE WISE DISTRIBUTION OF CITATIONS

The issue wise distribution of citations in the "The Indian journal of Nematology" written by the various researchers were distributed in 10 volumes and 20 issues, which were considered for the study from the year 2014 to 2023. The spans of 10 years were taken into consideration which is shown in the Table No. 2.

Table No. 2 Issue Wise Distribution of Citations

Year	Vol. No.	Issue No.	No. of Citations	Percentage
2014	44	1	262	9.42
2015	45	1	338	12.15
2016	46	1	130	4.67
2017	47	1	316	11.36
2018	48	1	331	11.90
2019	49	1	275	9.89

2020	50	1	157	5.65
2021	51	1	245	8.81
2022	52	1	498	17.91
2023	53	1	229	8.23
Total		**10**	**2781**	**100.00**

Year	Vol. No.	Issue No.	No. of Citations	Percentage
2014	44	2	256	8.89
2015	45	2	246	8.54
2016	46	2	123	4.27
2017	47	2	352	12.22
2018	48	2	321	11.14
2019	49	2	238	8.26
2020	50	2	185	6.42
2021	51	2	364	12.63
2022	52	2	391	13.57
2023	53	2	405	14.06
Total		**10**	**2881**	**100.00**

Table No. 2, shows that the "The Indian journal of Nematology" of Issue Number 1 published 2781 citations in the year 2014 to 2023 i.e. maximum 498 (17.91%) number of citations in volume number 52 in the year 2022 and least number of citations in the year 2016 i.e. 130 (4.67%) citations in volume number 46 in Issue number 1.

"Issue Number 2" published 2881 citations in the year 2014 to 2023 i.e. maximum 405 (14.06%) number of citations in volume number 53 in the year 2023 and least number of citations in the year 2016 i.e. 123 (4.27%) citations in volume number 46 in Issue number 2.

3. CONTENT CATEGORY WISE DISTRBUTION OF ARTICLES

The frequency distribution of articles in the "The Indian journal of Nematology" written by the various authors were distributed mostly in Seven Content categories in different volumes and issues, which were considered for the study from the year 2014 to 2023.

Table No. 3 Content Category Wise Distribution of Articles

Sr. No.	Categories	No. of Articles	Average No. of Article per issue in %
1	Research Article	188	70.68
2	Review Article	42	15.79
3	Short Communication	13	4.89
4	Proceeding Paper	7	2.63
5	Editorial	7	2.63
6	Research Notes	5	1.88

7	Book Review	4	1.50
	Total	**266**	**100**

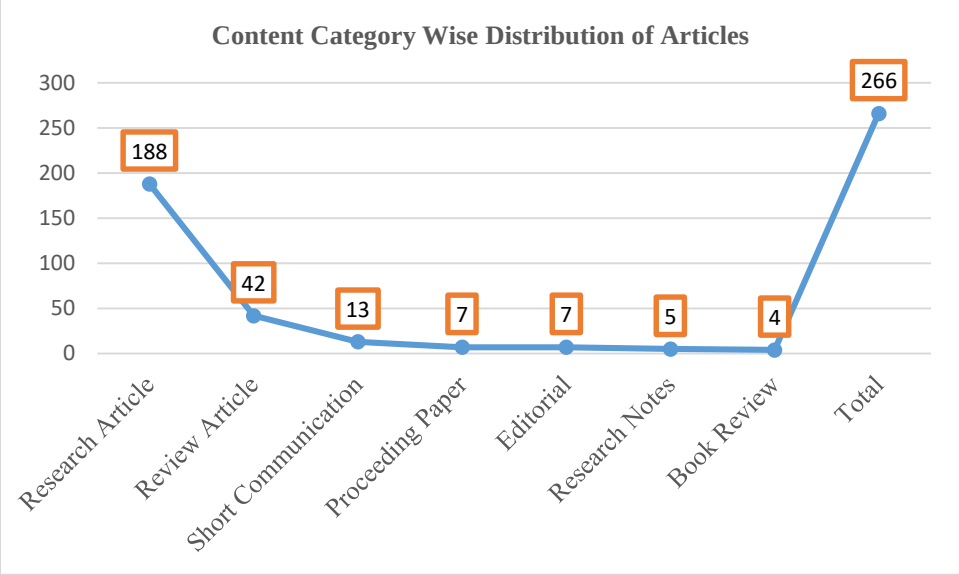

Figure No. 1: Content Category Wise Distribution of Articles

Table No. 3, shows the Content Categories of research articles in "The Indian journal of Nematology" and the source of journal. The table indicates that out of the total of 266 articles, volume and issue wise analysis content Categories Article Shows That Average No. of Per Category Is Research Article Scores the Top Position with 188 (41.25%) articles, second position goes to Review Article with 42 (15.79%) articles, followed by Short Communication with 13 (4.89%) articles respectively.

4. FORM WISE DISTRIBUTIONS OF CITATIONS

The form wise distribution of different forms of literature is used by researcher in "The Indian journal of Nematology". A total number of **5662** citations of 20 issues in 10 Volumes are distributed in different sources as per shown in Table No. 4.

Table No. 4 Form wise Distributions of Citations

Sr. No.	Types of Documents	No. of Citations	Rank	Percentage
1	Journal	5011	1	88.50
2	Book	477	2	8.42
3	Thesis	58	3	1.02
4	Website	48	4	0.85
5	Proceeding	27	5	0.48
6	Handbook	13	6	0.23
7	Abstract	7	7	0.12

8	Annual Report	5	8	0.09
9	Project	4	9	0.07
10	News Letter	4	9	0.07
11	Work Shop	2	10	0.04
12	Patent	2	10	0.04
13	Bulletin	1	11	0.02
14	Year Book	1	11	0.02
15	Conference	1	11	0.02
16	News	1	11	0.02
	Total	**5662**		**100**

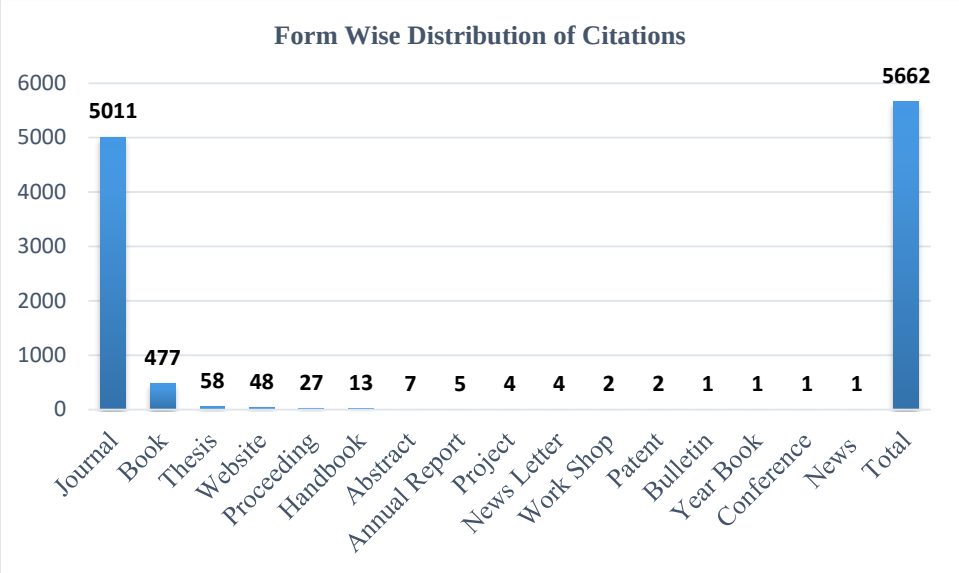

Figure No. 2: Form Wise Distribution of Citations

It was seen that in the Table No. 4, different forms of literature was used by researcher in "The Indian journal of Nematology" which heavily depend on periodicals sources for their studies. It was found that the journals are the major form of Journal used with citation count, of 5011 (88.50%) of total literature used, where as non-periodical sources account for 651 (11.50%) therefore periodicals are the first hand original and latest information in the subject and are most preferred channel of information use. Amongst citations of non-periodical sources book occupy 477 (8.42%) of citations, while the Thesis occupy 58 (1.02%) and remaining 112 (2.05 %) of literature contributes proceeding, Website, Conference, Annual Report, Bulletin, Meeting, Work Shop, Handbook, Survey, Abstract, Yearbook, Seminar etc. Hence the hypothesis is valid that the **"Researchers depend more on journal literature for their research" (Hypothesis No. 2, Table No.4.)**

5. DISTRIBUTION OF E-CITATIONS AND P-CITATIONS

Table No. 5 Distributions of E-Citations and P-Citations

Sr. No.	Types of Citations	No. of Citations	Percentage
1	E-Citations	48	0.85
2	P-Citations	5614	99.15
	Total	**5662**	**100**

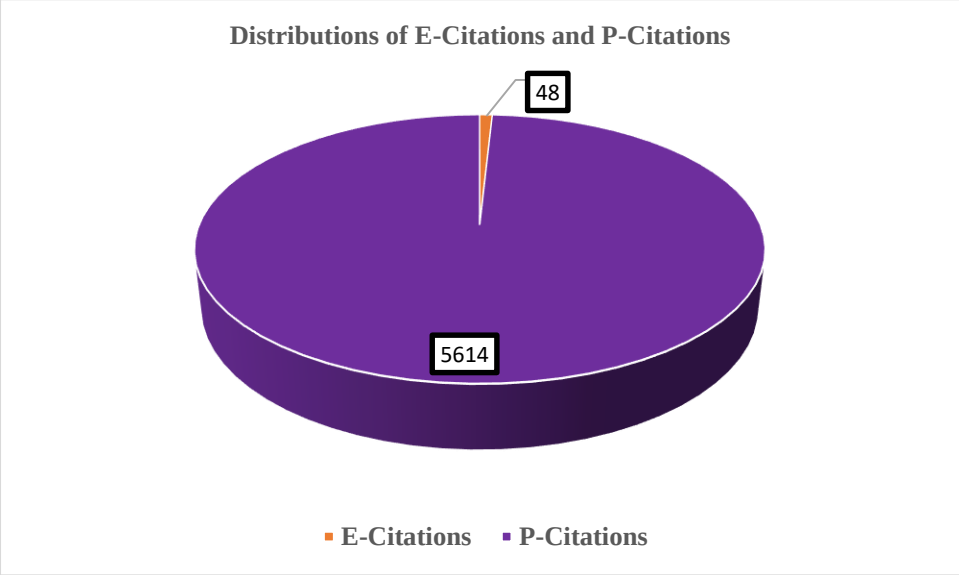

Figure No. 3: Distributions of E-Citations and P-Citations

The Table No. 5, Shows that of the total number of 5662citations, 5614 (99.15%) are printed citations whereas 48 (0.85%) are electronic citations, which indicates that the researchers depend mostly on printed literature than the electronic form of literature.

6. AUTHOR WISE DISTRIBUTION OF CITATIONS (SCIENTIFIC PRODUCTIVITY)

The characteristics of any subject literature include not only in the basic publishing pattern but that of authors themselves, so the authors were analyzed to determine the percentage of single, two, three and more than three authors. In order to have a clear picture the result of analysis of authors are presented in the Table No. 6

Table No. 6 Author Wise Distribution of Citations (Scientific Productivity)

Sr. No.	No. of Authors	No. of Citations	Percentage
1	Single Author	8043	52.36
2	Two Author	2532	16.48
3	Three Author	1200	7.81
4	Four Author	744	4.84
5	Five Author	460	2.99
6	Six Author	342	2.23
7	More Than Six Author	1993	12.97
8	Not Mentioned	48	0.31
	Total	**15362**	**100.00**

The Table No. 6, indicates that out of total number of 15362 citations 8043 (52.36 %) are by single author, followed by 2532 (16.48%) citations by two authors, 1200 (7.81%) citations have three authors. 48 (0.31%) citations did not mentioned the name of authors. The finding also shows that the least citations are by more than six authors i.e. 1993 (12.97%) citations respectively.

The total number of 5662 citations in 10 volumes of The Indian journal of Nematology are written by single, two, three, Four, five, six, and more than six authors, it was also observed that in average number of authors single authored citations were seen in 8043 and rest 7217 citations were having two and three authored citations respectively. Hence the hypothesis **"Single authors are most productive than multi authors." is valid (Hypothesis No. 1, Table No.6).**

7. USE OF INDIAN AND FOREIGN LITERATURE

Table No. 7 Use of Indian and Foreign Literature

Sr. No.	Geographical Area	Citation	Percentage
1	Foreign	4661	82.32
2	India	196	3.46
3	Place Not Mentioned	805	14.22
	Total	**5662**	**100.00**

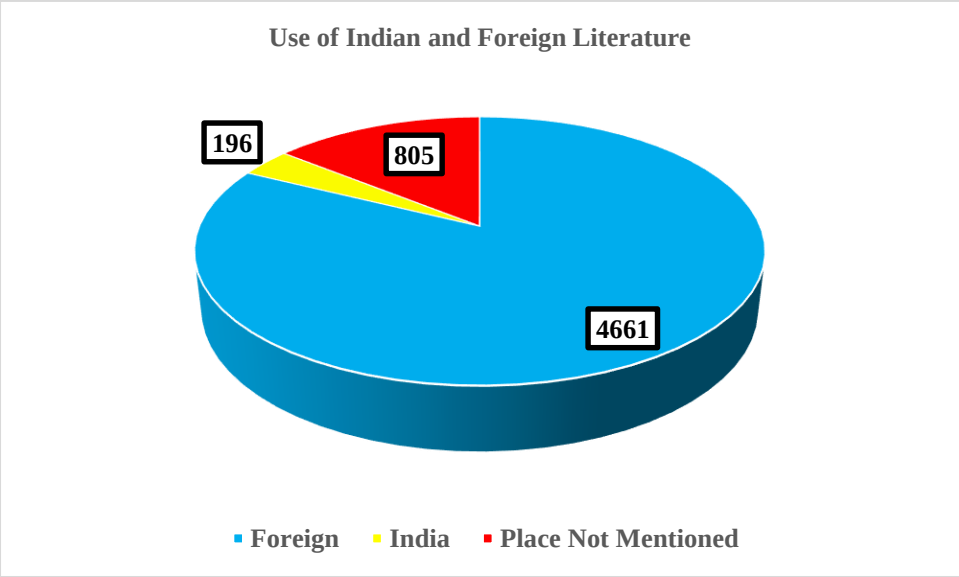

Figure No. 4: Use of Indian and Foreign Literature

The Table No. 7, show the geographical distribution of Indian and Foreign countries coverage. Out of 5662 citations, Indian citations are 196 (3.46%) and remaining 4661 (82.32%) citations are foreign citations whereas in 805 (14.22%) citations place is not mentioned. Hence the hypothesis is valid that is, **"Maximum number of contribution are from foreign countries" (Hypothesis No. 4, Table No. 7).**

8. LANGUAGE WISE DISTRIBUTION OF CITATION

The total number of **5662** citations of 10 volumes of "The Indian journal of Nematology" was distributed among 12 different languages as shown in Table No. 8.

Table No. 8 Language Wise Distribution of Citation

Sr. No.	Language	Citation	Rank	Percentage
1	English	5529	1	97.65
2	Portuguese	21	2	0.37
3	Russian	18	3	0.32
4	Chinese	17	4	0.30
5	German	38	5	0.67
6	French	17	6	0.30
7	Hungarian	6	7	0.11
8	Italian	6	7	0.11
9	Spanish	3	8	0.05
10	Japanese	5	9	0.09

11	Arabic	1	10	0.02
12	Turkish	1	10	0.02
	Total	**5662**		**100**

Citations appeared in Multilingual. The Table No. 8, shows that 5529(97.65%) documents were cited in English language. 21 (0.37%) documents were cited in Portuguese language while remaining 112 (1.98%) documents were cited in other languages. Hence the hypothesis is valid that is **"English is predominant language regarding journal and books in agriculture" (Hypothesis No. 3, Table No. 8).**

Conclusion

The present study analysed 266 articles containing 5662 citations published in the Indian Journal of Nematology during 2014–2023. The findings reveal that journal articles were the most preferred source of information, accounting for 88.50% of total citations, while printed citations dominated with 99.15%. The year 2022 recorded the highest citation percentage (15.70%). Research articles represented the largest content category, with 188 articles. Single-author citations accounted for the highest share (52.36%), indicating the significant contribution of individual authors. Foreign sources contributed 82.32% of citations, while English was the predominant language, accounting for 97.65%. Overall, the study highlights researchers' preference for journal literature, printed resources, foreign publications, and English-language documents. It provides useful insights into citation patterns, information-use behaviour, and scholarly communication in the field of Nematology.

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