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CITATION ANALYSIS OF LIFE SCIENCE RESEARCH IN ASSAM UNIVERSITY: A CASE STUDY

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ABSTRACT:

In this paper citation analysis is done with 2654 citations appended at the end of the doctoral thesis in the department of Life Sciences, Assam University during the period 2001-2007. Citation analysis and content analysis are the statistical methods applied to citations to evaluate different parameters. It is observed that journals are the most popular information source in the field of Life sciences than other document types. Journals contribute 82.37% citations with 2186. The most of the journals published from U.S.A. It is also identified that S. K. is the most productive author. The present study helps the librarians to collect and organize information according to the requirement of the user.

KEYWORDS: ***Bibliometrics, Citation analysis, Scientometrics, Bibliographical analysis, Citation indexing, Life Science, Assam University.***

1. INTRODUCTION

Information and knowledge play a vital role in the in academic paradigm. These are vital in socio-economic and cultural development of individual and the world. Due to information explosion individuals were more and more involved in research activities. As a result information are scattered in all around globally. There were exponential growths in research in field of Science, Social Sciences and in interdisciplinary nature. The productive research in academia is gaining momentum as scholarly literatures in different disciplines were published. The research trends posed many problems for the subject expert, library professional and scientists. They need to design and develop a need based information system and services for information retrieval to meet the expectation of user community. Bibliometrics is a branch of information theory that attempts to analyze quantitatively the written and web scholarly communications. Citation analysis and content analysis are the statistical methods applied to bibliographies. This paper is based on the citation analysis of 2654 citations appended in the doctoral theses in Life Sciences submitted to Assam University during the period 2001-2007. In this paper attempt has been made to identify the most significant source of information resources, core journals, geographical distribution of core journals, most prolific authors in the field of life sciences.

2. LITERATURE REVIEW

It is mandatory to understand the general problems in the area of study. Keeping in view the previous references as guidelines, efforts were made to find out that the research work related to the present study. Literature survey provides potential application in the further study.

Jeevan (2003) in his study analyzed the printed weekly issues of 'Employment News' from the year 1998-2001 to assess the job opportunities in the library and information science profession.

Mukherjee (2011) in his paper "Bibliometrics to webometrics: the shanging context of quantitative research" divided his area of research in two paradigm: before the World Wide Web and post world wide web. Under pre World Wide Web era the concept and development of terms librametry, bibliometrics, scientometrics, informatrics and in post world wide web era the concept webometrics&cybermetrics have been discussed. Also diagrammatically presented the relationship of both the terms.

Thanuskodi (2010) in his study found out that the majority of articles of bibliometric study contain bibliographic references to journals, books, conference proceedings, dissertations, etc.

Mayr and Scharnhorst (2015) in their paper "Combining bibliometrics and information retrieval: preface" discussed about relation between bibliometrics, scientometrics and informetrics and information retrieval.

Jarneving (2005) in his Ph. D. Thesis "A Bibliometric Study of the Literature Related to Research on Public Libraries" he found that the formal channel of scholarly communication are monograoh though the research article also plays an important role. Journal citation in the field of Library and Information Science was found as important contribution as compared to other fields.

Kumar and Kumar (2008) did a study on Journal of Oilseed Research. He had analyzed 8093 citations.

Maharana (2014) in his study entitled "Malaria research in India during 2003-2012: a bibliometric analysis" he had focused on the research publication of Indian researchers on malaria research during 2003 to 2012. They also compared malaria affected Asian countries of global rank with their publication and death rates.

Rana (2010) in his study on Indian Mammal Science literature during the period of 1990-1999. He found that mammalogist contributions were mainly journal citations.

Diodato in1994 defined it as the "study of publications and communication patterns in the distribution of information by using mathematical and statistical techniques, from counting to calculus"

According to Sengupta, the bibliometric is the organization of classification and quantitative evaluation of publication patterns of all macro and micro communications along with their authorship by mathematical and statistical applications and calculations.

From the list of above literature review it is observed that the previous studies were done by using mathematical and statistical techniques to identify the most profile author, significant information source etc. in their respective field. In the present study an attempt has been taken for citation analysis of doctoral thesis submitted in subject of life sciences, Assam University.

3. OBJECTIVES OF THE STUDY

The objectives of the present study are as follows:

i. To identify the most cited sources of information cited by the researchers in the field.
ii. To identify average number of references cited per theses.
iii. To determine the core journals in Life sciences.
iv. To study the geographical distributions of core journals.
v. To determine the highly ranked authors in the field.

4. METHODOLOGY

The present study aims to understand the attributes of information sources used by researchers in Life Science discipline particularly Assam University. Methodology chosen in the present study is citation analysis which is used to study in detail the bibliographic feature of the Doctoral theses and citation analysis of reference appended at the end of each thesis, submitted to the Assam University from 2001 to 2007. The study covers 08 Ph.D theses submitted to School of Life Sciences for award of doctoral degree during the said period. There are total 2654 citations collected and entered in MS Excel and all the data

were rearranged and analysis was done to find out document wise distribution, ranking of author, ranking of core journals, geographical distribution of core journals in the field of life sciences.

5. DATA ANALYSIS AND INTERPRETATION

There total numbers of 2654 citations were collected from the Ph. D. thesis in life science research during 2001 to 2007. In this paper an attempt has been taken to examine the data collected from Doctoral Theses in Life science, Assam University, Silchar. It examines the measure form of literature, ranking of journals, author, and distribution of citation according to publishers and country.

5.1. Year wise Theses Submission

In the present study it is found that there is an increasing trend in the thesis submission in different years. The researcher in this discipline has been conscious about the research work in the field of Life science discipline which are presented in the Table-1 and Figure-1below:

Table 1: Year wise Theses Submission

Year of Submission	No. Of Thesis
2001	1
2006	3
2007	4
Total	**08**

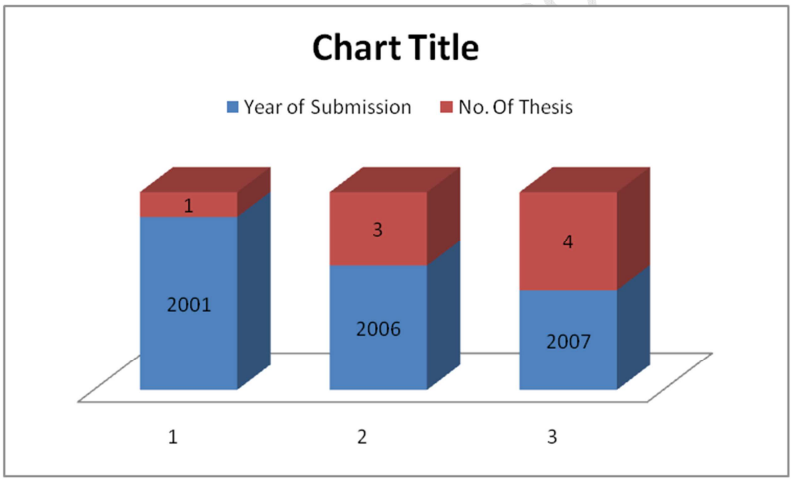

Figure 1: Year wise Theses Submission

From the above figure:1 it is observed that 4 nos. of theses submitted in the years 2007 which is highest , 3 nos. of theses submitted in 2006 and 1 no. in 2001 which is least in number.

5.2 Number of Citation per Thesis

The number of citations appended at the end of each thesis has been shown in the Table-2 and Figure-2. All the thesis were given code Thesis No. 01, Thesis No. 02 and so on according to their year of submission to identify them.

Table 2: No. of Citation per Thesis

SL. No.	Thesis No.	No. Of Citation
1	Thesis No. 01	355
2	Thesis No. 02	221
3	Thesis No. 03	325
4	Thesis No. 04	703
5	Thesis No. 05	304
6	Thesis No. 06	245
7	Thesis No. 07	248
8	Thesis No. 08	253
	Total	2654

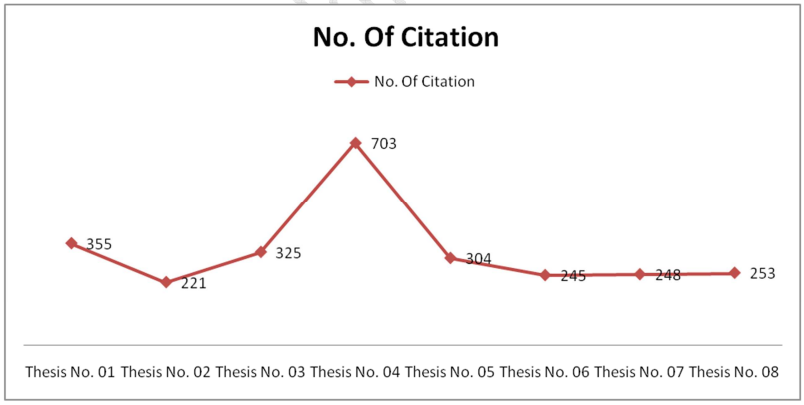

Figure 2: No. of Citation per Thesis

The above figure shows that the more no. of citations present in the Thesis No. 04 having 703 citations and least number in Thesis No. 02 with 221 citations.

5.3 Distribution of Citations in different document form

Cited documents are grouped into nine forms/categories i.e. journals, books, edited books, reports (including annual, govt., project, research and technical reports), conference proceeding, theses/dissertation, reference book, unpublished and web resources and others. The form-wise distribution of citations has been done in order to know the most dominant forms cited by the researchers.

Table:3 gives the form-wise distribution of citations and shows that 2186 citations were from Journals, accounting for about 82.37% of the total number of 2654 citations. This was followed by other forms such as Books (11.94%), Conference proceeding (1.85%), Edited book (1.47%) and Reports (1.13%). This study clearly shows that most of the studies are being conducted by consulting journals, the most dominant form of document. In other words, journals are the most significant source among the scientist and researchers engaged in the field.

Table3: Distribution of Citations in different document form

Sl. No.	Document Type	No. of Citations	Cumulative citations	Percentage of Citations (approx.)	Cumulative Percentage of Citations(approx.)
1	Journal articles	2186	2186	82.37	82.37
2	Book	317	2503	11.94	94.31
3	Conference/Seminar Proceedings	49	2552	1.85	96.16
4	Edited Book	39	2591	1.47	97.63
5	Report	30	2621	1.13	98.76
6	Others	21	2642	0.79	99.55
7	Theses/ Dissertations	6	2648	0.23	99.77
8	Web Resource	4	2652	0.15	99.92
9	Reference Book	2	2654	0.08	100.00
	Grand Total	2654			

5.4. Ranking of Core Journals

Journals play a vital role in academic achievement. This ranking of journals helps the librarians and information scientists in collection development policy to acquire the significant journals for life sciences discipline. Table:4 provides the ranking of journals in the fields of Life Science. In this study 25 core journals with 880 citations were taken into consideration and found that the journal "Mutation Research" has got the first rank, contributing 17.73% of citation, followed by Plant Physiology accounting for 16.48% of total citation as shown in Table:4.

Table 4:Ranking List of Core Journals

Ranking of Journals made on the basis of Citations						
SL. NO.	Rank	Name of the Journal	No. Of Citations	Cumulative No. of Citations	Percentages	Cumulative Percentage
1	1	Mutation Research	156	156	17.73	17.73
2	2	Plant Physiology	145	301	16.48	34.20
3	3	Journal of Economic and Taxonomic Botany	88	389	10.00	44.20
4	4	Experimental Botany	49	438	5.57	49.77
5	5	Physiologia Plantarum	43	481	4.89	54.66
6	6	Economic Botany	33	514	3.75	58.41
7	7	Infection and Immunity	32	546	3.64	62.05
8	8	Journal of Clinical Microbiology	30	576	3.41	65.45
9	9	Bulletin of medico-ethno-botanical research	26	602	2.95	68.41
10	10	Bulletin of the Botanical Survey of India	25	627	2.84	71.25
11	11	Ethno botany	23	650	2.61	73.86
12	12	Plant Biology	22	672	2.50	76.36
13	12	Plant Cell Environment	22	694	2.50	78.86
14	13	Indian Fern Journal	20	714	2.27	81.14
15	13	Plant Science	20	734	2.27	83.41
16	13	Planta	20	754	2.27	85.68
17	14	Ancient Science of Life	18	772	2.05	87.73
18	15	Mutagenesis	17	789	1.93	89.66
19	16	Veterinary Microbiology	15	804	1.70	91.36
20	17	Folklore	13	817	1.48	92.84
21	17	New Physiologist	13	830	1.48	94.32
22	17	Science	13	843	1.48	95.80
23	17	Toxicology Letters	13	856	1.48	97.27
24	18	Environmental and Molecular Mutagenesis	12	868	1.36	98.64
25	18	Nature	12	**880**	1.36	100.00
			880		**8.79**	

5.5 Geographical Distribution of Core Journals

Table:5 Shows the country-wise distribution of periodicals have worked out would provide library professionals a direction for geographical distribution of reading materials in their bibliographical and documentation services. It helps in taking decision about the acquisition of literature from productive countries. In this study it is found that 11 core journals, out of 25 core journals were published from U.S.A. and 5 core journals were published from India and 4 from United Kingdom. Table 5 present the country-wise distribution of citations of journals. The representation reveals that the researchers in India depend heavily on literature produced in U.S.A.

Table 5: Geographical Distribution of Core Journals Table

Sl. No.	Rank	Name of the Journal	No. of citations	Place of publication
1	1	Mutation Research	156	Netherland
2	2	Plant Physiology	145	USA
3	3	Journal of Economic and Taxonomic Botany	88	India
4	4	Experimental Botany	49	United kingdom
5	5	PhysiologiaPlantarum	43	USA
6	6	Economic Botany	33	USA
7	7	Infection and Immunity	32	USA
8	8	Journal of Clinical Microbiology	30	USA
9	9	Bulletin of medico-ethno-botanical research	26	India
10	10	Bulletin of the Botanical Survey of India	25	India

11	11	Ethno botany	23	USA
12	12	Plant Biology	22	USA
13	12	Plant Cell Environment	22	USA
14	13	Indian Fern Journal	20	India
15	13	Plant Science	20	Netherland
16	13	Planta	20	Germany
17	14	Ancient Science of Life	18	India
18	15	Mutagenesis	17	United kingdom
19	16	Veterinary Microbiology	15	Netherlands
20	17	Folklore	13	United kingdom
21	17	New Physiologist	13	USA
22	17	Science	13	USA
23	17	Toxicology Letters	13	Netherland
24	18	Environmental and Molecular Mutagenesis	12	USA
25	18	Nature	12	United Kingdom
	Total	2186	880	

5.6. Rank list of Core Authors

Rank list of authors of core journals provides significant contribution by the authors in a particular discipline by attracting more citations. The bibliometric technique can successfully point out the core authors who are the most significant in a field. It is helpful to identify the quality of literature produced by the authors and its impact on future research. Table 1 provides the names of authors whose journal articles have been cited and arranged according to their frequency of citations. There are 30 core authors are listed excluding corporate authors contributing 284 citations which is 10.70% of total citation. S. K. Jain, M. A. Khan, C. R. Tarafdar, R. and R. Rao got first, second and third rank respectively shown in the figure 3.

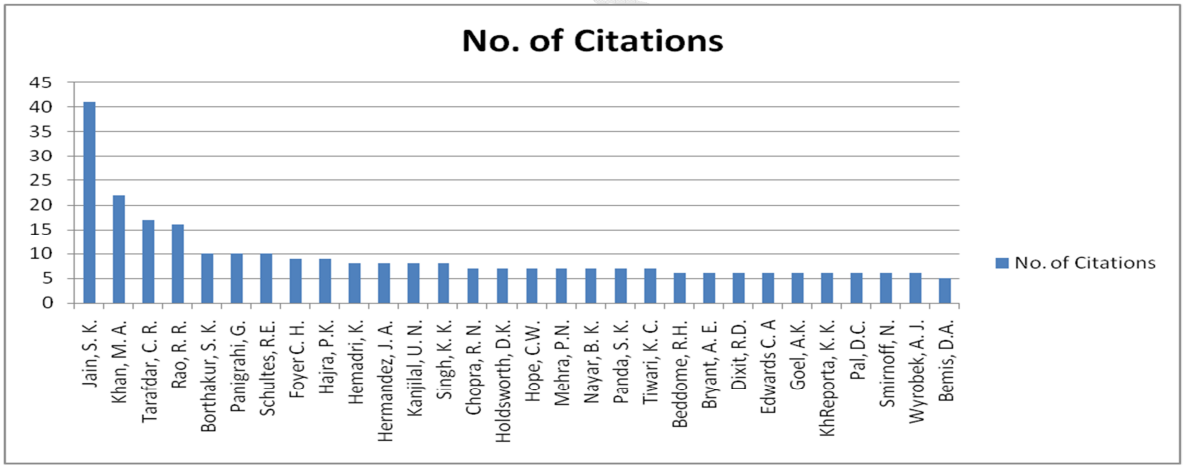

Figure3: Ranking of Author

7. FINDINGS AND CONCLUSION

In this paper citation analysis is done with 08 numbers of theses submitted in Life Sciences discipline contributing 2654 citation. The following conclusion were drawn in the present study:

i) It is observed that there are 08 numbers of thesis submitted in Life science department , Assam University during 2001-2007.

ii) It is observed that an average of 331.75 citation were appended at the end of each thesis and highest 703 citations were present in theses no. 4 and lowest in thesis no. 02 with 221 citations.

iii) It is found that journals were the most important source of information in the field of Life Sciences.

iv) As regards the use of different forms of literature, the analysis shows that research scientists in life science depend mostly on journals. Journals contribute 82.37% and books share 11.94% of all the citations.

v) The journals are the most important sources in conducting research for Ph.D. students in their respective field. This study is related to the Assam University, so, the librarian can distribute the library budget, as per the distribution of citations, in their collection development for Life sciences in particular. Such planning may help judiciously use of shrinking budget in collection development.

vi) It is found that the journal "Mutation Research" published from Netherlands has got the first rank, contributing 17.73% with 156 of citation, followed by "Plant Physiology" from USA with 145 accounting for 16.48% of total citation.

vii) It is identified that the researcher in the field of life sciences depends more in foreign journals. The researcher were widely depends on the journals published from U.S.A.

8. CONCLUSION:

Citation analysis is use to analysis of structure of literature using various tools such as counting rank-frequency distribution for easy information retrieval. The Citation analysis should be used by library professional for efficient and effective management of library to fulfill the users need. Citation study in any discipline helps the library professionals in the planning their library management activities like collection development, judicious use of shrinking budget, accurate weeding and stacking policy etc. In this paper an attempt has been taken to analyze the Doctoral theses in life sciences, Assam University and found that journals are the most important source of information. The journal "Mutation Research" is very significant journal with 156 citations followed by "Plant Physiology" with 145 citations and Journal of "Taxonomic and Economic Botany" with 88 citations got the third rank. This research study may provide objective view to the librarians in the preparation of collection development policy and manage their budget.

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