Citation Analysis of Doctoral Theses on Botany Completed at the University of Burdwan (2000-2019)

Sayantani Majumder* and Dr. Subarna Kumar Das**

Abstract

The purpose of this study is to examine the distribution of botany theses at The University of Burdwan from 2000 to 2019 and to oversee research, analyse the performance in a particular field, determine the mean number of written citations for botany, and assess research collaboration using citation authorship. Taking this investigation's findings into consideration, data were collected, analysed, and produced. The scientific research has changed over time, citation analysis of 79 PhD theses of botany completed at The University of Burdwan from 2000 to 2019 has been done. There are 23527 bibliographic references in the 79 botany PhD theses. The mean number of references each thesis is 297.81.The study found that the trend in authorship was toward team works instead of works done by one person. Even though the number of single-author contributions has been going down, they are still being made. There was also an analysis of how different aspects of the cited literature changed over time. The rate of collaboration, as well as the supervisory pattern, authorship pattern, and productivity of theses according to year, are all subjected to research. In order to determine what kinds of documents are most often used in the research activity, the citations are examined. This descriptive study examines the progression of the research activities that followed University of Burdwan Botany Doctorate degrees.

Keyword: Citation Analysis, Botany, Supervisors, Authorship, References

Introduction: The utilization of a publication is most accurately represented by its citations, which are the most reliable indicators currently available. The entire bibliographic description of a referenced source that is utilized in or is pertinent to a specific research endeavor is referred to as a citation. The word "citation" refers to this description. A comprehensive examination of citations in a field gives a criterion for assessing the level of contact among scholars. Bibliometrics is a collection of methodologies for studying and measuring texts and information. Contentanalysis and citation analysis are two typical bibliometric methodologies. In the discipline of library and information science, bibliometrics is a growing research focus. Calculations based on mathematics and statistics are used to conduct this process, which include the quantitative analysis of publications covering all micro and macro communications. The study of bibliometrics may be used to any subject to determine the patterns and development of the literature.

*Research Scholar (JRF), Department of Library and Information Science, Jadavpur University**;** Email : india.sayantani@gmail.com

**Professor, Department of Library and Information Science, Jadavpur University; Email: skd_ju2002@yahoo.co.in

Its use in library management, information system design, understanding managers' information demands, and creation of management policies and strategies in the field of management studies is extensively established. Citation is the quantitative study of references or citations that are included as an integral aspect of any scientific paper. A bibliography or list of references is often presented by the author(s) of a document as an authoritative source of information. Citation analysis is a way to learn about the relationships between subjects, the effectiveness of an author, and a publication. Moreover, citation analysis may be used to comprehend users. Studies based on citations provide dependability, relevance, and appropriate speed. The most significant, higher profile programs at an institution might benefit greatly from knowledge provided by citation studies of dissertations. Theses and dissertations make it clear what doctoral students need and what kind of research the faculty and departments specialize in as a whole. While processing is needed, an institution's dissertations include current and past data, save for new programs.

Review of Literature:

According to Banateppanvar et al. (2013), scholarly articles are the primary information sources for researchers in the subject of Zoology at the Kuvempu University from basis of the statistics of 74.47% of total citations, the books and monographs citation is 18.02%, although citations from seminar proceedings, theses, dissertation, reports, patents, and newspapers are also present. It has also been noted that those researchers are making use of the resources provided by the internet. In addition, there was a greater contribution of referenced items made by many authors, and the degree of cooperation was 0.71. The most often mentioned journal, according scientometrics observation of Chikate and Patil's (2008) to analysis of references in University of Pune Library and Information Science Ph.D theses. More than 6,000 citations were evaluated from 27 PhD theses. Rahman and Bhattacharya (2012) conducted a study on citation analysis, where 75 number of Doctoral theses received from botany department of the North Bengal University, between 1987 and 2007 in order to follow the evolution of scientific research. Although journals from other nations are also referenced, those published in India, the USA, and the UK hold the top ranks. Some common journal titles were found i.e Phytopathology journal, Indian Phytopathology and Physiological and Molecular Plant Pathology journal. They conducted a research somewhat comparable to it on the theses of Physics that were submitted to the same institution. The data for the study came from the doctoral dissertations submitted to the Department of Statistics and Operations Research and accepted by AMU, Aligarh

between 1985 and 2005(Ansari and Ahmad, 2007). Researchers submitted the most dissertations in Operations Research, which was 6 (25%) and the least in Information Theory and Reliability Theory, which was 2 (8.3%), between 1985 and 2005. The research was based on the 2266 bibliographic references that were attached to the 24 different PhD dissertations.Eckel, 2009 conducted a survey on aforementioned topics from the Western Michigan University's College of Engineering and Applied Sciences, where 96 number of PhD theses and 24 number of dissertations are completed.

According to the examination of the collected data, PhD students in engineering utilise a substantially higher percentage of research paper articles (44.3% to 29.3%) and seminar papers (21.9% to 12.5%) than master's students do.Kaur and Verma (2022) conducted an analysis of the doctoral theses related to Citation Analysis that were uploaded to Shodhganga throughout the years 2012-2019 by the Department of Library and Information Science from the Maharashtra Region.Analysis of the Doctoral theses related to Citation Analysis that were uploaded by the Department of Library and Information Science from Maharashtra Region during 2012-2019 on Shodhganga (Mubeen, 1996) reveals that the Bradford's multiplier is seen to observe a geometric series pattern over the literature.

Statement of the Problem:

In the present study, an effort is made to evaluate the widespread pattern of information utilisation among botany researchers. The purpose of this research is to extract qualitative and quantitative analysis from the citations that can be discovered at the conclusion of the chapters of Botany PhD theses that were handed in to The University of Burdwan between the years 2000 and 2019.

Scope and Objectives:

1. To examine the year-by-year distribution of botany theses submitted at The University of Burdwan between 2000 and 2019.

2. To investigate the supervisoryform in botany.

3. To evaluate the performance of supervisor in the chosen field.

4. To look at the citations that have been written down to find out whatthe mean number of citations is in botany.

5. To examine the rate of collaboration in research by evaluating the authorship pattern of citation.

6. To investigate the trend of contributing writers.

7. To see how different kinds of documents, such as magazines,books, journal articles, reports, conference proceedings,the Internet, etc. are used.

8. To establish the consecutive distribution of citations in order to estimate the constructive years of publications utilized.

Methodology:

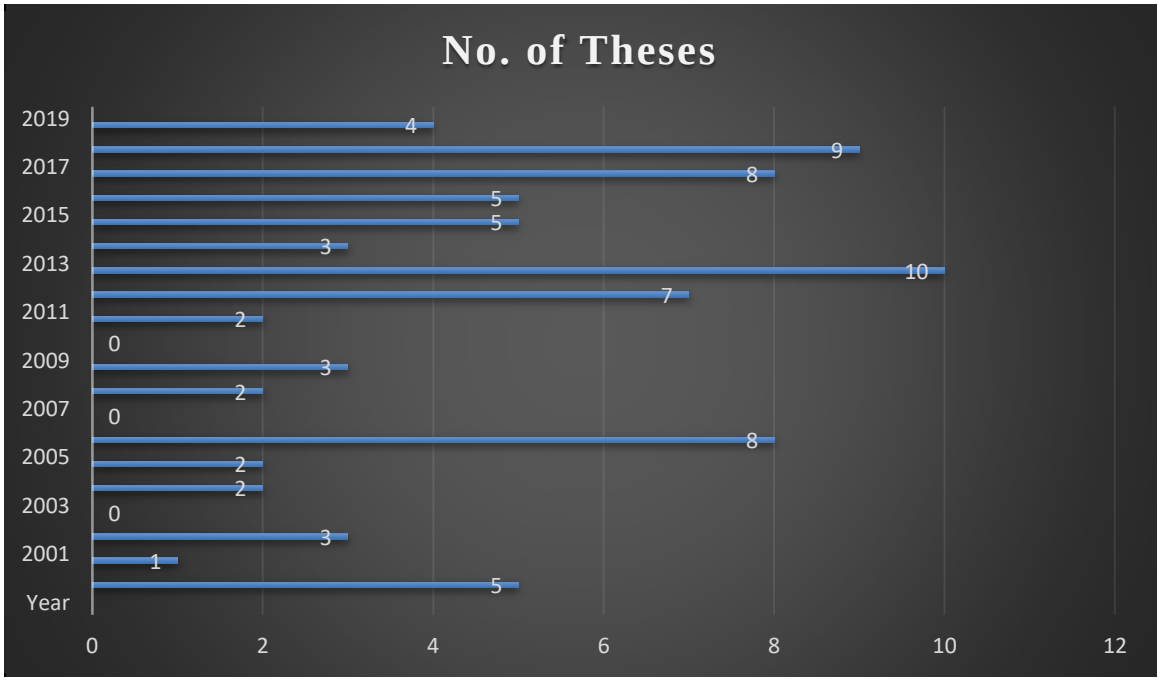
A descriptive study was used as the research design. For the purpose of this study, the doctoral theses that are the results of research have been examined. The sample for the study is made up of 79 Botany doctoral theses that the University of Burdwan accepted between 2000 to 2019. All of the bibliographic information (authors' names, supervisors' names, the item's category, publishing information, age of the item as of the thesis year, etc.) appended to the 79 theses was compiled in a preconfigured data sheet using Microsoft Access. 23,527 citations in all have been added to these works. The necessary data has been collected, examined, and collated in order to draw conclusions.

Data Analysis and Interpretation:

1. **Year-wise Breakup of Theses**

Sl. No.	**Year**	**No. of Theses**
1.	2000	5
2.	2001	1
3.	2002	3
4.	2003	0
5.	2004	2
6.	2005	2
7.	2006	8
8.	2007	0
9.	2008	2
10.	2009	3
11.	2010	0
12.	2011	2

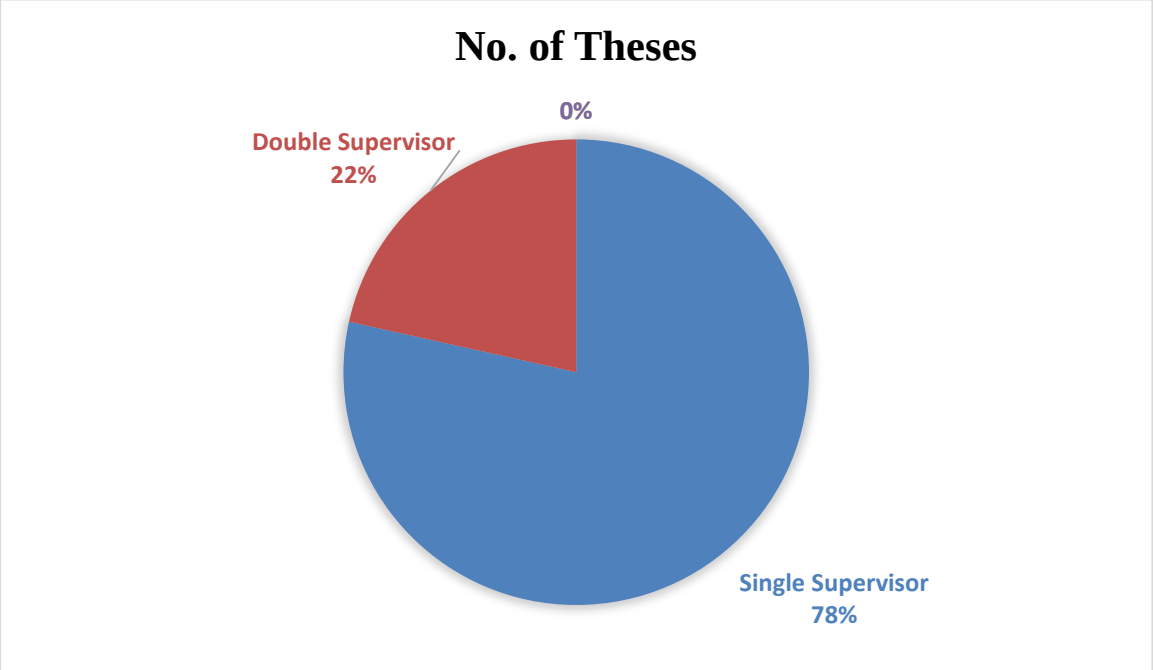
13.	2012	7
14.	2013	10
15.	2014	3
16.	2015	5
17.	2016	5
18.	2017	8
19.	2018	9
20.	2019	4
	Total	**79**



The distribution of Botany theses submitted at the respective department in The University of Burdwan from 2000 to 2019 is shown year by year in Table 1. In a total 79 theses have been submitted on the subject of Botany. From the data in the table above, we can conclude that 2013 had the highest total of theses filed (ten), followed by 2018 (nine) and 2006 and 2017 (each with eight). It is important to note that in 2003, 2007 and 2010, not a single PhD in Botany was conferred.

2. Supervising Pattern of Theses

No. of Supervisor	No. of Theses	Percentage
Single Supervisor	62	78.48
Double Supervisor	17	21.52
Total	**79**	**100**



The features of subject-specific literature include not only the fundamental publication patterns but also the writers. The number of authors has been segmented into single and multiple author categories, and the results have been examined. The table 2 shows the supervising pattern oftheses of Botany. According to the table, 78% of academics work under the supervision of a single supervisor, while roughly 22% of scholars work under the supervision of two supervisors.

3. Productivity of Supervisor: Botany

Sl. No.	Name of Supervisor	No. of Theses	Rank
1.	Abhijit	6	III

	Bandayopadhyay		
2.	Aloke Bhattacharjee	5	IV
3.	AmalenduSinhababu	1	VII
4.	Ambarish Mukherjee	12	I
5.	Amit Kumar Ghosh	1	VII
6.	Asok Kumar Mukherjee	1	VII
7.	Balen Nandi	2	VI
8.	B. K. Datta	1	VII
9.	Debnath Palit	1	VII
10.	D. K. Singh	1	VII
11.	D. P. Kushari	1	VII
12.	Gautam Ganguly	1	VII
13.	Jagatpati Tah	3	V
14.	Jai Prakash Keshri	5	IV
15.	Jiban Kumar Pal	1	VII
16.	Kajal Gupta	3	V
17.	Kalyan Kumar De	1	VII
18.	M. A. Choudhuri	1	VII
19.	M. S. Mondal	1	VII
20.	N. C. Chatterjee	5	IV
21.	P. K. Bhattacharyya	3	V
22.	P. K. Pal	5	IV
23.	P. S. Basu	2	VI
24.	Radhanath Mukhopadhyay	7	II

25.	Rajib Bandopadhyay	1	VII
26.	Ranajit Kumar	2	VI
27.	Sikha Dutta	7	II
28.	Soumen Bhattacharjee	3	V
29.	Subrata Laskar	1	VII
30.	S. K. Roy	1	VII
31.	Tinkari Dalal	3	V
32.	Tushar Kanti Maiti	6	III

According to table 3, Dr. Ambarish Mukherjee has been responsible for supervising the most doctoral candidates in the field of botany, with a total of 12. He is followed in this regard by Dr. Radhanath Mukhopadhyay and Dr. Sikha Dutta, each of whom has supervised 7 researchers. Dr. Tushar Kanti Maiti, who has overseen the work of six academics , sits in third position.

4. Average of Citations

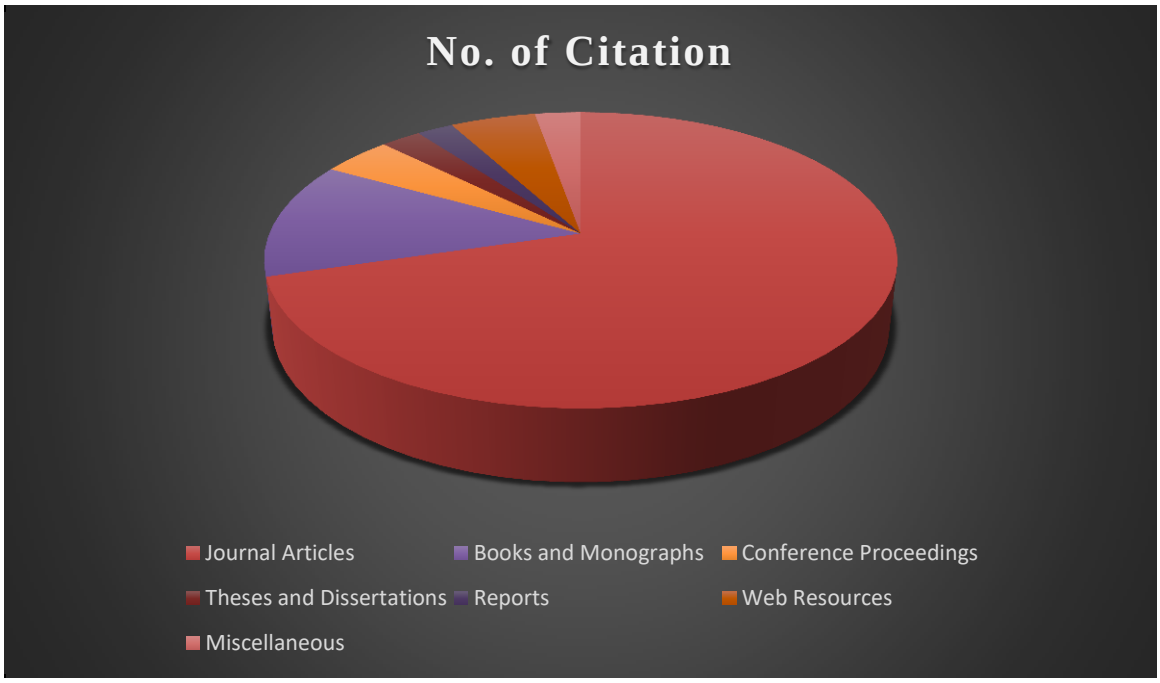
No. of Theses	Total Citations	Average
79	23527	297.81

The average number of citations of the theses of Botany subject are shown in Table-4. The total number of citations counted in this study is 23527. It is also mentioned that the maximum number of citations per theses is 3089 in the year 2013, which is analyzed in Table -7.

5. Distribution of Citations in Bibliographic Forms

Sl. No.	Bibliographic Form	No. of Citation	Percentage	Rank
1.	Journal Article	16560	70.39	I

2.	Books and Monographs	2994	12.73	II
3.	Conference Proceedings	1000	4.25	IV
4.	Theses and Dissertations	577	2.45	VI
5.	Reports	521	2.21	VII
6.	Web Resources	1221	5.19	III
7.	Miscellaneous	654	2.78	V



There are various ways to obtain information, including via books, journals, conference proceedings, theses etc. The primary goal of this research was to identify the most popular kind of source material. It would be beneficial for researchers to know the most prevalent types of documents used to create information on the topic. It would be beneficial for researchers to know the most prevalent types of documents used to create information on the topic. The research shows that the majority of the materials used were journal papers 16560(70.39), followed by Books and Monographs 2994(12.73), Web Resources 1221 (5.19), Conference Proceedings 1000(4.25) etc.

6. Authorship Pattern of the Citations

Sl. No.	No. of Authors	No. of Citations	Percentage	Rank
1.	One	7125	30.28	II
2.	Two	8637	36.71	I
3.	Three	3106	13.20	IV
4.	More than three	3996	16.98	III
5.	Corporate	663	2.81	V

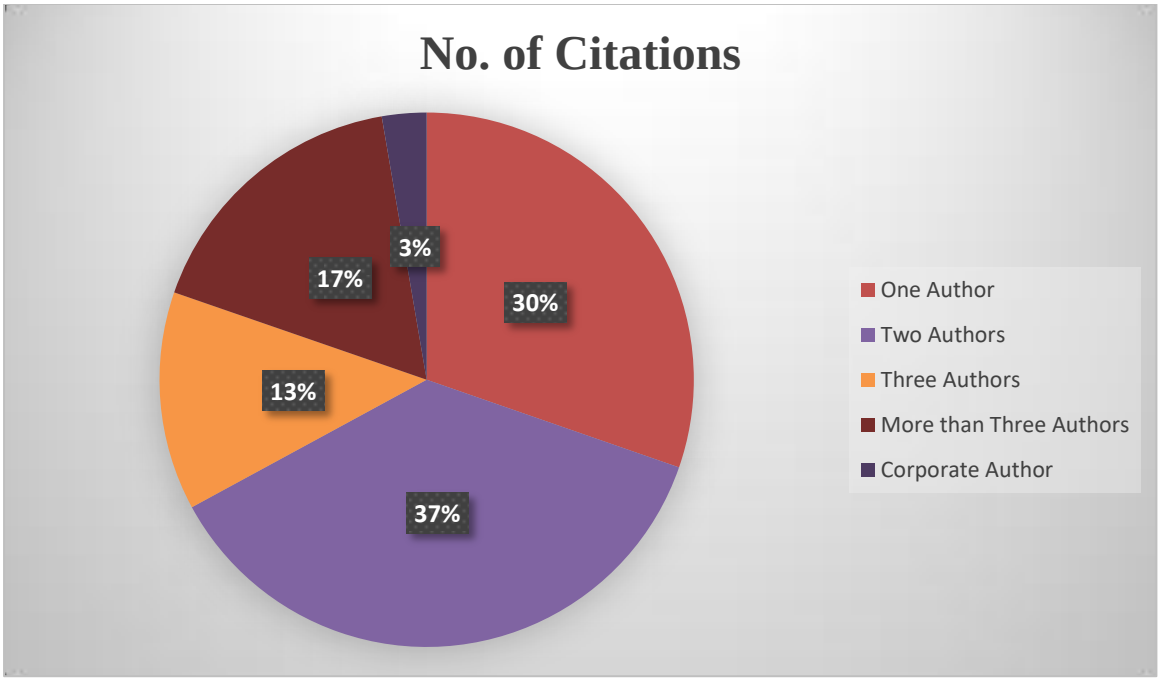


Table 6 represents the author dispersion in Botany in which double authored paper consist of the highest percentage (26.71%) of total 23527 citations. Single authored articles comprised 30.28% of the total cited papers. Three authored articles constituted for 13.20% and the remainingi.e. 16.98% were by more than three authors.

7. Chronological Distribution of Citations

Sl. No.	**Year**	**No. of Citation**	**Percentage**

1.	2000	1863	7.91
2.	2001	400	1.70
3.	2002	653	2.78
4.	2003	0	0
5.	2004	633	2.69
6.	2005	583	2.48
7.	2006	2498	10.62
8.	2007	0	0
9.	2008	231	0.98
10.	2009	1102	4.68
11.	2010	0	0
12.	2011	386	1.64
13.	2012	2356	10.01
14.	2013	3089	13.13
15.	2014	601	2.55
16.	2015	2087	8.87
17.	2016	1360	5.78
18.	2017	2266	9.63
19.	2018	2604	11.07
20.	2019	815	3.46

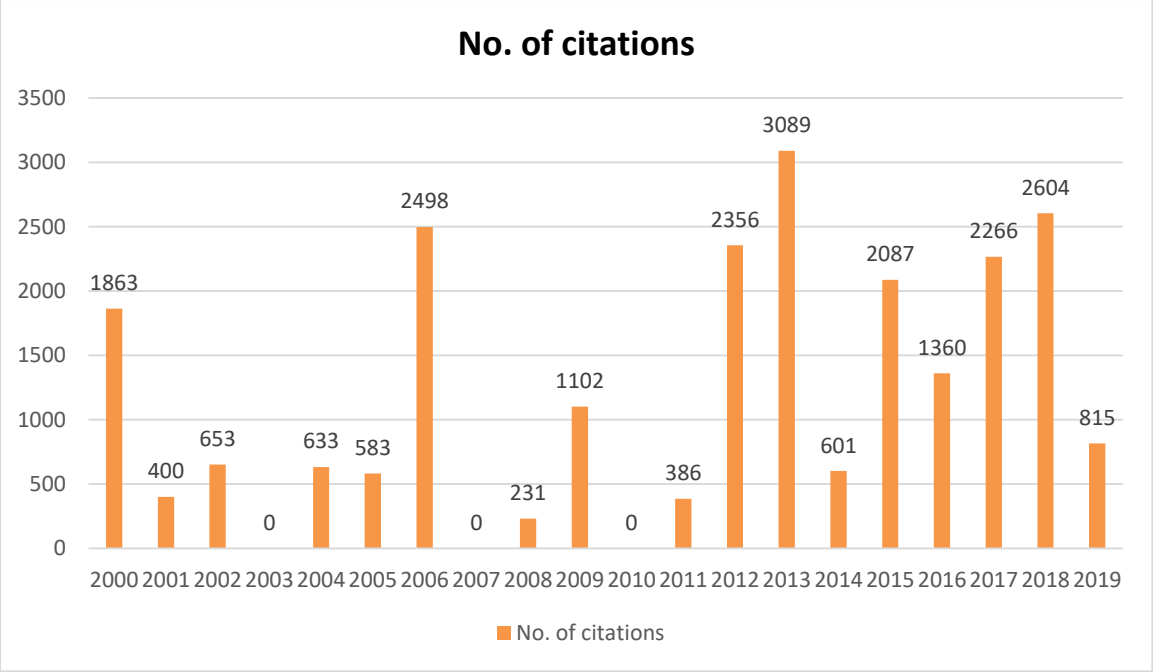


Table 7 shows that a total of 23,527 citations were evaluated to determine the age of usefulness of Botany articles. This is clearly indicated that the year 2013 (13.13%) is the most productive yearfollowed by 2018 (11.07%) is at second position and 2006(10.62) is at third position.The tendency for the remaining time groups is falling. This shows that the Botany researchers need information that is up-to-date for their work. Very few references are used that were written about a century ago.

Findings and Suggestions:

i) Maximum number (10) of the theses are submitted in2013, thereafter 2018 (9), and 2006 & 2017 (8 numbers in each year).
ii) No PhD was awarded in Botany in 2003, 2007 and 2010.
iii) 78% of scholars work under the supervision of a single supervisor, whereas roughly 22% of scholars work under the supervision of two supervisors.
iv) Dr. Ambarish Mukherjee supervised the most doctoral works in Botany, with 12, thereafter by Dr. Radhanath Mukhopadhyay and Dr. Sikha Dutta, who have supervised 7 scholars.
v) Each botany thesis has an average of 297.81 citations.
vi) Maximum the documents used for citation were Journal articles 16560(70.39), followed by Books and Monographs 2994(12.73), Web Resources 1221 (5.19), Conference Proceedings 1000(4.25) etc.
vii) Double authored paper consist of the highest percentage (26.71%) of total 23527 citations.

viii) The years 2013 (13.13%) is the most productive year of citation followed by 2018 (11.07%) is at second position and 2006(10.62) is at third position.

Similar studies can be carried out in different universities for the subject 'Botany' to generalize the findings and to get in-depth knowledge about the literature used by researchers in Botany discipline.

Citation Analysis studies should be carried out for different subjects in The University of Burdwan, which will be in turn boost interdisciplinary research projects in that university.

Webometric Studies can be carried out for prominent journals in Botany.

Wibliometric Analysis and Citation Analysis can be carried out for recent years in Botany and for all other higher education disciplines in that university which will be helpful to decide online subscription policies and consortia membership issues and to update the library collection as per the need of the researchers.

Bibliometic studies in Botany which will verify different bibliometric laws can be undertaken for that university to crosscheck or strengthen the findings of the present study.

Conclusion:

The present study is a method for analysing the information employed by the University scientific community from 2000 to 2019 based on the PhD dissertations defended in the Department of Botany at The University of Burdwan in order to follow the progress of scientific research.The findings gave valuable insight into the knowledge foundation of the university's research output in this particular field.There were a total of 79 PhD theses of botany that were reviewed throughout the years from 2000 to 2019. These theses include a total of 23,527 bibliographic references, with the number of references found in each thesis averaging out at 297.81. The importance of authorship in scientific study cannot be overstated. A comprehensive investigation of the authorship of citations demonstrates that research is increasingly done as a team rather than individually.The study demonstrates that collaborative research in botany is on the rise. Despite a diminishing trend, contributions by a single author are nevertheless prevalent.This can be as a result of the scientists working alone on research projects instead of in teams.As a result, the author list on the majority of scientific papers in the field of botany will have more than one name. Scientists choose to work together for many different reasons, like getting access to equipment, money, expert advice, and more information.

The majority of the publications that are cited are articles that were published in different journals. The number of references to other types of documents, such as books and monographs, web resources, and conference proceedings, is relatively low. References to theses and dissertations, reports, and other documents are extremely uncommon. The high number of citations of journal articles shows that scientific journals are an important part of the Scientific Communication process. Other types of documents like monographs, theses, online articles, and reference materials like, subject dictionaries, encyclopediasetc. are rarely cited, which may be caused by both the difficulty in gaining access to such literatures and the important fact is these sources aren't as important in scientific research.

Since authors of PhD theses rely heavily on the information that can be obtained primarily in periodicals, journals are the source of citations that are cited the most often. This seems to be because there are many different ways to get material in this field, and Periodical literature often represents the latest and most current ideas. Scholars are thus particularly intent in reading journals, and libraries have emphasized the necessity of building up their collections in the relevant fields.

The references for the doctoral theses would at least fulfil the bare minimum standards for scientific excellence because they had been accepted in the regular academic procedure. The PhD dissertations used for this study showed a lack of consistency in reference organization. It is anticipated that a unified standard will be adopted in order to improve the visibility of the works that have been cited. The concerned authority may adopt either its individual standard or the Indian Standard for this reason.

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