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Content Analysis Journal of Biological Chemistry: A Study (2018-2022)

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Abstract

The study presents a Scientometric Analysis of 7369 articles published in "Indian Researcher in Biotechnology" during the year 2018-2022. The data is collected and analyzed by using the MS- Excel software. The study focused on various aspects authorship pattern & author productivity, institution-wise distribution, geographical distribution of contribution, document type-wise distribution. Out of 7369 contributions, the study revealed that most of the papers (93%) of papers were contributed by multiple authors. United States is the top producing country with 50.79% publications of the total output. All the articles were published in English language. The study demonstrates and elaborates on the various aspects of the Journal, such as its distribution of article by year, authorship patterns, and distribution of contributions by institution, subject distributions, rank of cited authors, and geographical distributions of authors.

Keywords: Content analysis, Biological and Chemistry, Authorship Pattern, Degree of Collaboration, Author Productivity.

Introduction

Bibliometrics is a set of methods used to study or measure texts and information (Wikipedia, 2011). A bibliometric analysis is employed by many researchers to study the literature in a given field. Bibliometrics is the use of statistical methods in the analysis of a body of literature to reveal the historical development of subject fields and patterns of authorship, publication, and use. In other words, it is a type of research method used in library and information

science. It utilizes quantitative analysis and statistics to describe patterns of publication within a given field or body of literature. Researchers may use bibliometric methods of evaluation to determine the influence of a single writer or to describe the relationship between two or more writers or works.

Scientometrics shares common interests and a relationship with both Bibliometrics and Informetrics. The fields of informetrics, bibliometrics, and scientometrics are components of the study of discipline dynamics as they are reflected in the creation of their respective literature (Hood & Wilson, 2001).“Scientometrics” is the English translation of the title word of Nalimov’s classic monograph Naukometriy in 1969, which was relatively unknown to western scholars even after it was translated into English. Without access to the internet and limited distribution, it was rarely cited. However, the term became better known once the journal Scientometrics appeared in 1978 (Garfield, 2007).

Review of Literature

There have been few scientometrics studies conducted on individual journals. Some of the relevant studies in the aforementioned for direction are creditable of review.

Wankhede, Kakde andKhandare (2015), they study "A Bibliometric Analysis of the Urban Library Journal onDoaj" includes 36 articles that were published in the journal "Urban Library Journal" between 2010 and 2014.The SPSS program is used to gather and examine data. The study focused on several aspects, such as the most prolific journal authors, the institutions involved, the types of documents, the publications, and the citations, year-by-year. 33.33% of the papers, according to the study, had multiple authors who each contributed to the authoring. The United States is the top producer, accounting for 100% of all publications generated. The pieces were published in English alone. The analysis provides more details and examples of a number of Journal characteristics, such as authorship trends and article distribution by year.

Mukherjee (2008) analyzed the authorship pattern of scientific productions of the four most productive Indian academic institutions for the eight-year –period from 2000 to

2007.The findings indicate that, out of the four universities, Delhi University's authors supplied the most publications, with Banaras Hindu University following closely after. Additionally, there is a growing trend among Indian authors to collaborate on joint research projects and to work with foreign authors more frequently. Among the most popular fields of study at these four Indian universities are biochemistry and molecular biology. 28 references are cited on average each item, and 3.56 citations are obtained every item.

Khandare SharadPrabhakar and Sonwane Shashank (2016)conducted a study on the "World Journal of Microbiology and Biotechnology" content analysis. The amount of international collaboration, the increase of publications year over year, the geographical distribution of research output, the patterns of authorship and collaboration in the publication, and the most productive authors in the field are all included. It was discovered that, with 2901 publications (or 36.98%) of the overall output, China is the leading producer.

KhapardeVaishali andPawarShubhangi (2013) made study on Authorship Pattern and Degree of Collaboration in Information Technology. Itconsists of the nature of authorship patterns in information Technology, degree of collaboration on information technology.Found that in the degree of collaboration of all years i.e. from 2000-2009 is almost same of the mean value as0.49 whereasthe degree of collaboration during the overall 10 years is 0.71.

Sonwane Shashank S. and HarneShyam B. (2015) conductedstudy of Content Analysis of “Annals of Biomedical Engineering Journal”. This study focuses year-wise growth ofpublications, Geographical distribution of research output, and the authorship and collaboration pattern in the publication. Foundthat USA is the top producing country with 3271 publications (57.79) of the total output.

Objective of the Study

The main objective of the study is to present the growth of literature, and make Quantitative and qualitative assessment of the research by analyzing the research outputs towards identifying the following facts:

1. Year-wise Distribution of Contribution.

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2. Year-wise Authorship pattern of Contribution.

3. Degree of Collaboration

4. To find out the most productive Author.

5. Language-wise distribution of citations

6. Ranking of First authors.

7. Ranking of All authors. (General Author)

Scope and Limitation

This study is limited to the "Indian Researcher in Biotechnology" during the year 2018-2022. Total 7369 articles were published during the year 2018-2022 on PubMed. The Collected data was organized, analyze and generate the tables, using the MS Excel and presented in table, graphs and charts format for final study.

Data Analysis and interpretation:

In views of the objectives of the present study, analysis the "Indian Researcher in Biotechnology" on PubMed during 2018-2022.

The collected data will be analysised by different scientometric techniques and parameters viz authorship pattern. Authorproductivity, Degree of Collaboration,etc.which is presented in the form of tables and figures.

1Year wise citation of article

Table No. 1: Year wise citation of article

Sr.No	Year wise	Total	Percentage
1	2018	1072	14.55
2	2019	1215	16.49
3	2020	1321	17.93
4	2021	1811	24.58
5	2022	1950	26.46
	Total	**7369**	**100.00**

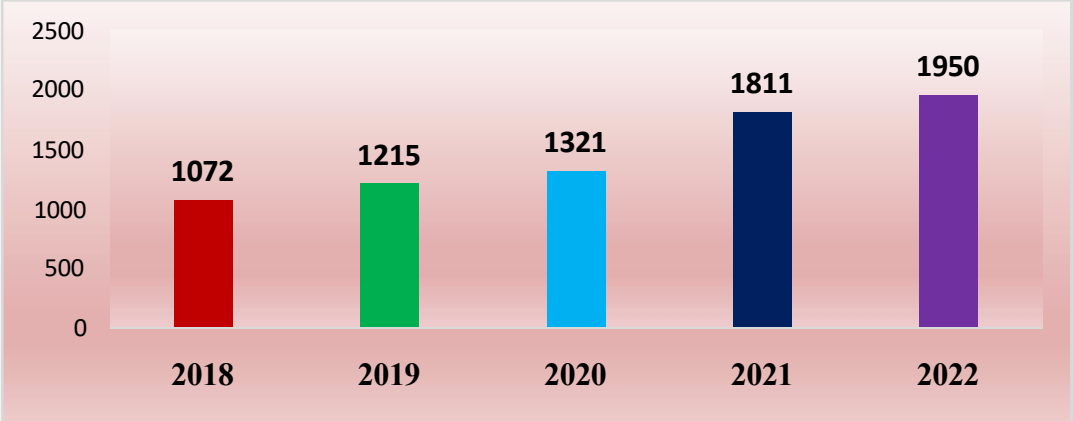

Figure No. 1: Year wise citation of article

The distribution of research articles on Indian Physicist by year indexed in Web of Science from 2018-2022. It is clear that the number of research articles has been increased over the months. It is indicates also that of the 1950 articles published in 2022. i.e. (26.46%) has the highest number. While in the other years (73.54%) the lowest number.

2 Authorship pattern of citations

The authorship patterns of citation are arranged as Single, Two, Three, Four, Five, Six, Seven, Eight, Nine, Ten and More Than Ten Author. The citations are arranged under each category for counted their percentage in authorship pattern for showing the trends of research as solo or corporate in Indian Physicist research, which is shown in the table No.2. And figure no 2.

Table – 2 Authorship Pattern of Citations

Sr.No	Authorship Pattern	Frequency	Percentage
1	Single Author	61	0.83
2	Double Author	494	6.70
3	Three Author	814	11.05
4	Four Author	942	12.78
5	Five Author	928	12.59
6	Six Author	865	11.74
7	Seven Author	709	9.62
8	Eight Author	592	8.03
9	Nine Author	471	6.39
10	Ten Author	350	4.75
11	More Than Ten Author	1143	15.51
	Total	**7369**	**100.00**

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It is observed form the above table that, out of 7369 authors citations, the single author with 61(0.83%) of total citation, followed by two authors with 494(6.70%) citations, three authorship is most prominent with 814(11.05%) of total citations, four authors with 942(12.78%) citations, five authors with 928(12.59%) citations, six authors with 865(11.74%) citations, seven authors with 709(9.62%) citations, Eight authors with 592(8.03%) citations, Nine authors with 471(6.39%) citations, Ten authors with 350(4.75%) citations and the More Than Ten Author citations are 1143(15.51%) citation respectively.

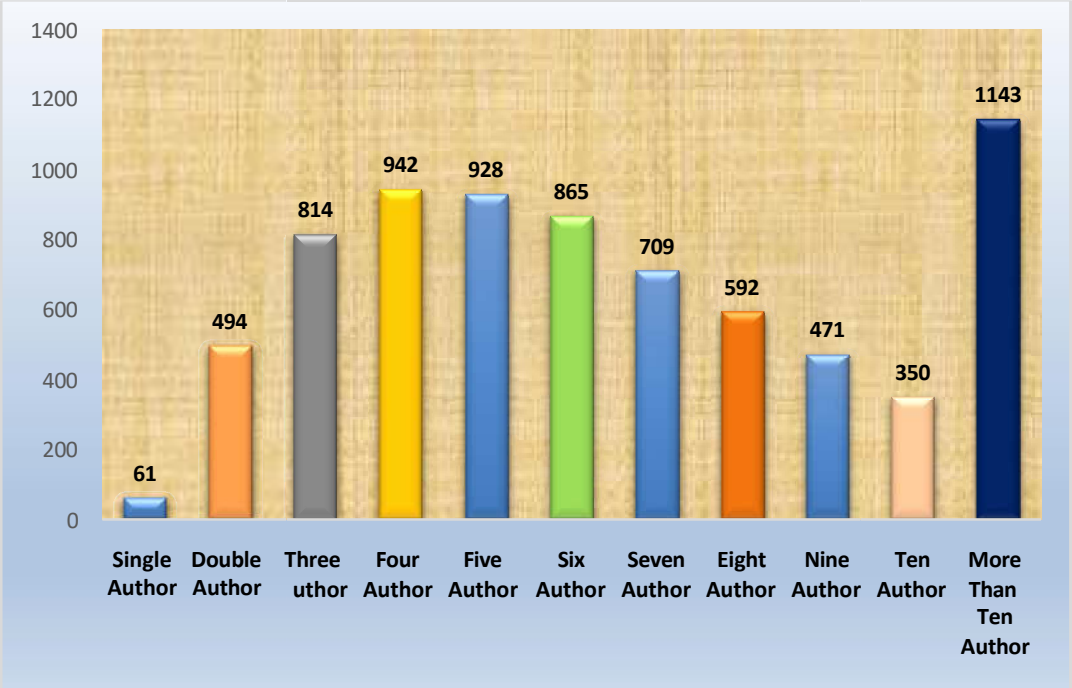

Figure No.2 Authorship pattern of total citations

3Authorship Pattern year wise

Collaborative research is very much feature of thelibrary and information scienceespecially during the 21st century. It is the natural reflection of complexity. Scale and cost of modern irresisaction in Library and Information Science. Multi Authorship provides different measures of collaboration in the subject. Table No.3 reveals the authorship pattern of the articles published during the period of study.

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Table No.3: Authorship Pattern year wise

Sr.No	Year	Authorship pattern					Total	%
		Single	Two Author	Three Author	Four Autor	More Than Four Author		
1	2018	12	78	159	161	662	1072	14.55
2	2019	10	103	149	162	791	1215	16.49
3	2020	12	100	144	184	881	1321	17.93
4	2021	11	108	202	211	1279	1811	24.58
5	2022	16	105	160	224	1445	1950	26.46
	Total	61	494	814	942	5058	7369	100.00
	%	0.83	6.70	11.05	12.78	68.64	100.00	

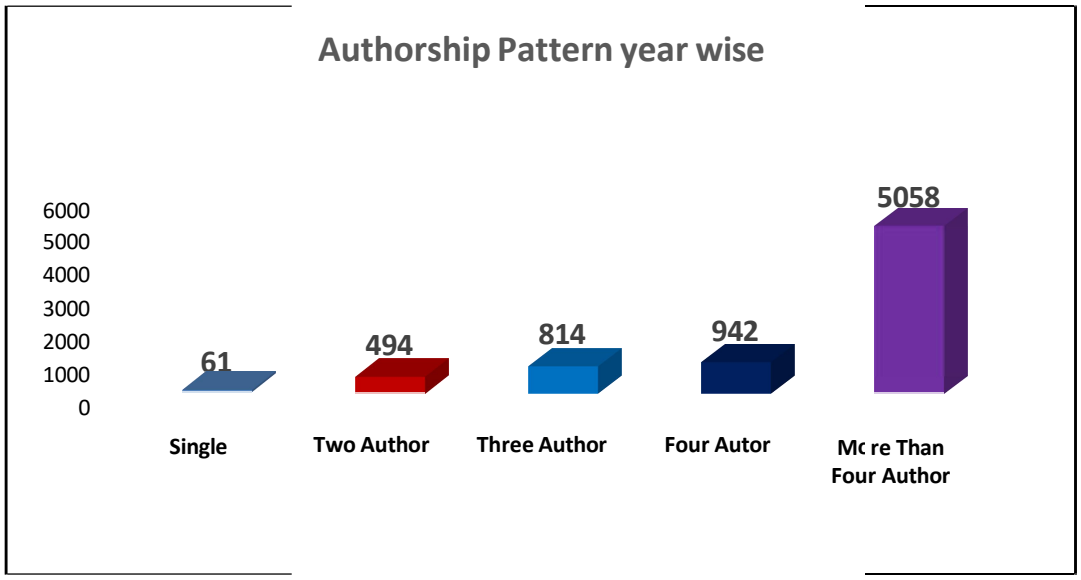

Figure No. 3: Authorship Pattern year wise

It is clear that the 16 articles written by single author and it is the highest number published in PubMed2022. It indicates also that 10 articles written by single author published in PubMed 2019. It is the lowest number. The number of research articles has been published in PubMed written by two authors i.e. 114 (2012) it is the highest number and 58 articles published in 2009 with lowest number. It indicate that in 2012, 120 research articles are published written by three authors as well as 71 research articles are published in 2007 and those are lowest number. Table No.4.2 shows the distribution of research in year 2012. It is the lowest number in the average of ten years 2003 to 2012. 112 articles written by four authors published in 2012 i.e. highest number. More than four authorscontributed282 research articles in the year 2006. It is the lowest contribution in the year 2003 to 2012. In the year 2012, 442 research articles

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contribution by more than four authors. It is the highest number is the ten years rank. 3378 research articles are contributed by more than four authors.

4. Degree of Collaboration

Degree of collaboration (DC) among different authors presented in Table No.4.10 in order to calculate the Degree of Collaboration (DC) the formula given by Subramanyam (1983) have been employed which is expressed mathematical as;

$$DC = \frac{\quad}{+}$$

Whereas- DC= Degree of Collaboration
Nm= No. of multi authors papers
Ns= No. of Single authored Papers.

Here- Nm= 1060
Ns= 12

$$DC = \frac{1060}{12 + 1060} = 0.9888$$

Table No.4:Degree of Collaboration

Sr. No.	Years	Single Author Papers	Multi Author Papers	TA	TP	DC
1	2018	**12**	1060	7794	1072	0.9888
2	2019	**10**	1205	9821	1215	0.9918
3	2020	**12**	1309	10135	1321	0.9909
4	2021	**11**	1800	16764	1811	0.9939
5	2022	**16**	1934	16286	1950	0.9918
	Total	**61**	**7308**	**60800**	**7369**	**0.9917**

(N.B. TA-Total Authors, TP-Total Paper, DC-Degree of Collaboration)

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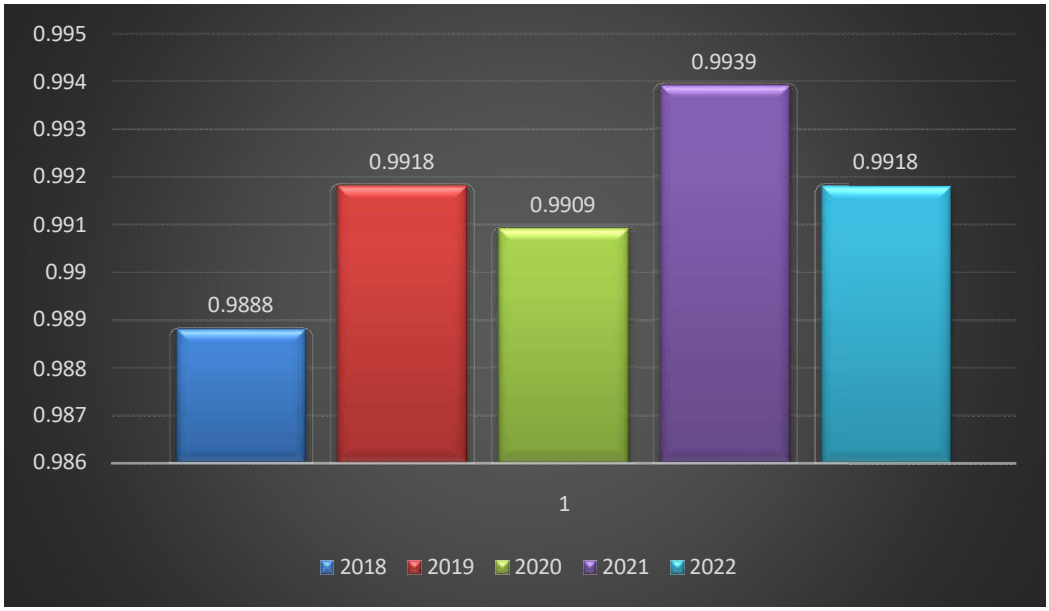

Figure No. 4: Degree of Collaboration

The above table reveals that, the year wise degree of collaboration which is falls between 0.9918 and 0.9909 with an average of 0.9917 during the study period.

5Authors Productivity

Yashikane and Others (2009) in their papers published is Scientometrics Journal have given a formula to calculate Average Author Per Paper (AAPP) and Productivity Per Author (PPA). The formula is mathematically represented as follows:

$$AAPP = \frac{\text{No. of Authors}}{\text{No. of Papers}}; \quad = \frac{7794}{1072} = 7.27$$

$$PPA = \frac{\text{No. of Papers}}{\text{No. of Authors}}; \quad = 0.014 \quad \frac{1072}{7794}$$

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Table No.5: Authors Productivity

Sr.No.	Year	Total Paper	Total Author	AAPP	PPA
1	2018	1072	7794	7.27	0.14
2	2019	1215	9821	8.08	0.12
3	2020	1321	10135	7.67	0.13
4	2021	1811	16764	9.26	0.11
5	2022	1950	16286	8.35	0.12
	Total	**7369**	**60800**	**8.25**	**0.12**

(N.B. AAPP-Average Author per Paper, PPA-Productivity per Author)

Figure No.5: Authors Productivity

Table No. 5 illustrates the average author per paper for the period 2018-2022 is 8.25 and productivity per author mentioned as 0.012.

The above table shows that the data pertaining to author productivity and average author per year. The highest no. of productivity per author is 0.14and lowest no of author is found 0.011 In the case of Average Author Per Paper the highest no. was found that 9.26 and lowest number was found 7.27.

6. Language-wise distribution of citations

A total number of 7362 citations of Indian Physicist in web of Science are distributed among languages used is shown in Table No.4.7

Table– 6 Language-Wise Distribution of Citations

Sr. No	Language	Total	Percentage
1	English	7369	100.00
Total		**7369**	**100.00**

It is observed from the above table that, out of 7369 citations, the English language scores the top position with 7359(99.96%) citations, this again shows that English language is dominant over other languages

7. Rank list of Authors (General)

In the general rank list of author's equal weightage was given to every author irrespective of their position, whether he/she is on first, second or on sixth position. Accordingly, the rank list of authors of overall proceedings was prepared and list of five top ranked authors is presented in table no. 4.11

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Table No. 7: Ranking of authors (Author may be on any position)

Table – 7 Author Ranking

Sr.No	Author	Citation	Percentage	Rank
1	Kumar A	337	0.55	1
2	Kumar S	255	0.42	2
3	Singh S	167	0.27	3
4	Kumar V	162	0.27	4
5	Sharma S	156	0.26	5
6	Sharma A	150	0.25	6
7	Kumar P	144	0.24	7
8	Singh A	133	0.22	8
9	Kumar R	126	0.21	9
10	Kumar D	121	0.20	10
11	Kumar M	115	0.19	11
12	Gupta S	104	0.17	12
13	Dhama K	84	0.14	13
14	Pandey A	83	0.14	14
15	Sharma P	82	0.13	15
16	Singh R	79	0.13	16
17	Singh AK	77	0.13	17
18	Das S	75	0.12	18
19	Chakraborty S	74	0.12	19
20	Singh SK	70	0.12	20
21	Ghosh S	65	0.11	21
22	Singh N	62	0.10	22
23	Singh J	61	0.10	23
24	Sharma V	59	0.10	24
25	Kumar N	59	0.10	24
26	Das P	58	0.10	25
Conti….				
	Total	**60800**	**100.00**	

The author which the is most preferred by researchers, that document is most important to keep in the library for that purpose author ranking is essential to librarians as well as researchers. It is observed form the above table that, a total of 60800 personal authors appeared from 7369 citations of Indian Researcher inBiotechnology from PubMed. The ranking of personal authors according to their contributions is reveals thatThe top most cited author are “Kumar A.” scores the top position with 337 (0.55%) citations, second rank goes to ‘Kumar S’ with 242 (0.42%) citations, followed by “Singh S.’ with 167 (0.27%) citations respectively

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Findings, Conclusions and Suggestions.

The findings are based on the analysis of collected data appended in 7369 articles in Indian Researcher in PubMed, These are following.

1. The highest numbers 1950 (26.46%) of papers were published in 2022 contributing.

2. Year wise degree of collaboration an average of 0.99 during the study period.

3. Average author per paper for the period 2018-2022 is 8.25 and productivity per author mentioned as 0.012

4. All articles were published in English language (100%).

5. The top most cited author are “Kumar A.” scores the top position with 337 (0.55%) citations.

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