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Journal of Biosciences: A Scientometric Analysis

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Abstract

Scientometrics is the science of measuring and analysing science. Scientometric study can be applied to any discipline to findout its trends and growth of Literature. India publishes a large number of domestic periodicals belonging to different disciplines of S & T. *Journal of Biosciences*, is the base of this study, It is a quarterly journal (March, June, September and December) published by the Indian Academy of Sciences, Bangalore. It covers all areas of Biology and is the premier journal in the country within its scope. Scientometric Analysis of 394 articles published in ten volumes from 2001 to 2010 has been carried out. The number of contributors and their distribution in different volumes, Authorship Pattern, Foreign and Indian authored contributions, Institution wise Contribution, Geographical List of Contributions at National and International Level have been studied.The higher number of Contributions by Single Author and Major Contributions by India. The growth and popularity of the journal is showing a steady upward trend.

Keyword : Scientometrics, Contributions. Distributions.

Introduction

Scientometrics is the science of measuring and analysing science. In practice, scientometrics is often done using bibliometrics that is measurement of (scientific) publications.Modern scientometrics is mostly based on the work of Derek J. de Solla Price and Eugene Garfield..The latter founded the Institute for Scientific Information which is heavily used for scientometric analysis. Scientometrics involves quantitative evaluation of publications of all micro and macro communications through mathematical and statistical calculations. Scientometric study can be applied to any discipline to findout its trends and growth of Literature.

India publishes a large number of domestic periodicals belonging to different disciplines of S & T. Several of these periodicals are abstracted and indexed by many of the international abstracting and indexing services.

Journal of Biosciences, the base of this study, It is a quarterly journal (March, June, September and December) published by the Indian Academy of Sciences, Bangalore. It covers all areas of Biology and is the premier journal in the country within its scope. Journal of Biosciences began in 1934 as Proceedings of the Indian Academy of Sciences (Section B). This continued until 1978 when it was split into three parts: Proceedings-Animal Sciences, Proceedings-Plant Sciences and Proceedings-Experimental Biology. Proceedings-Experimental Biology was renamed Journal of Biosciences in 1979, and in 1991, Proceedings-Animal Sciences and Proceedings-Plant Sciences merged with it.From January 2007, Journal of Biosciences is being co-published with Springer.The bibliometric indicators of the journal are as follows: Impact factor 1.88 (2010) Immediacy index 0.085; and Cited half life 5.9 years. All these factors are responsible for the selection of the journal for the study.

Source Journal

The source used for this study is Journal of Biosciences .It is one of the leading journals in science. Journal of Biosciences is a Quarterly journal published by the Indian Academy of Science,Banglore. It publishes original research papers in Biology.

Objectives of the Study

The present study include following Objectives

1. To study the Authorship pattern in the Biology Literature
2. To identify the geographical distribution of Journal
3. To study the volume wise distribution of contribution and to find out the average number per volume
4. To find out productivity count of contributions both at national and international level
5. To study the number of pages used in different volumes

Scope

An attempt has been made to analyse the contributions in 40 issues of 10 volumes of the Journal of Biosciences from 2001-2010.

Methodology

The data pertaining to each of the contributions in volume 26-35 in terms of authorship, number of pages in each issue and volume were noted. All the data were subsequently observed, analysed and tabulated for making observations. In order to maintain the uniformity of the study special editions are not taken and only main issues (ie March, June, September and December) are taken for analysis.

Data Analysis

Table 1 shows the distribution of contributions volume-wise

Year	Vol No	No of Issues	No of Contributions	%
2001	26	4	38	9.65
2002	27	4	31	7.87
2003	28	4	43	10.91
2004	29	4	41	10.41
2005	30	4	39	9.89
2006	31	4	35	8.88
2007	32	4	47	11.93
2008	33	4	40	10.15
2009	34	4	38	9.65
2010	35	4	42	10.66
		40	394	100

Table 1 we will find that out of 394 contributions, 11.93 percentage of them were contributed in 2007,10.91 percentage of them were contributed in 2003,10.66 percentage of them were contributed in 2009,10.41 percentage of them were contributed in 2004.It is inferred from the table of distribution of contributions from 2001 to 2010 that the level of percentage of distribution has not stable. A notable attribute of the study that the year 2007 shows the maximum number of contributions.

Table 2; Distribution of Contributions Issue-wise

Month	Volume Number									
	26	27	28	29	30	31	32	33	34	35
March	7	8	11	13	11	10	15	10	8	9
June	15	9	12	6	7	6	14	12	10	11
September	9	9	8	13	6	6	10	7	7	12
December	7	5	12	9	15	13	8	11	13	10
	38	31	43	41	39	35	47	40	38	42

Table 2 exhibits monthly wise contributions of journals. Volume No 32 ,shows the highest number of total contributions. Next to that Volume No 28.The month March shows more issues in volume No 32 .compare to other ten volumes Volume No 27 has lowest distribution of 31.

Authorship Patterns

Table 3 shows the Authorship Patterns of Contributions

No of Authors	No of Contributions	%
Single Author	28	7.11
Double Author	92	23.35
Triple Author	95	24.11
Four Author	56	14.21
Five Author	42	10.66
More than Five Author	81	20.56
Total	394	100

Table 3 explicates the authorship pattern of contributions.out of 394 contributors, a Triple Author has contributed 24.11% of the Total articles.23.35% of the articles contributed by double authors and 20.56% of the articles contributed by multiple authors. Only 7.11% of the articles presented by Single Authors.. A siginificant note of the study is that the majority of the articles are contributed by Triple Authors This will necessitate the individual authorship pattern .

Table 4 : Authorship Patterns of Contributions - Volume – wise

Volume No	Single Author	%	Double Author	%	Triple Author	%	Four Author	%	Five Author	%	More than 5 Author	%
26	3	10.71	11	11.96	14	14.74	4	7.14	4	8.69	2	2.47
27	4	14.29	10	10.87	8	8.42	4	7.14	1	2.38	4	4.94
28	3	10.71	13	14.13	14	14.74	6	10.71	3	7.14	4	4.94
29	4	14.29	13	14.13	8	8.42	6	10.71	3	7.14	7	8.64
30	3	10.71	8	8.69	9	9.48	6	10.71	6	14.29	7	8.64
31	3	10.71	6	6.52	9	9.48	6	10.71	5	11.90	6	7.41
32	5	17.86	6	6.52	14	14.74	5	8.93	5	11.90	12	14.81
33	2	7.14	11	11.96	7	7.37	4	7.14	5	11.90	11	13.58
34	1	3.57	6	6.52	4	4.21	6	10.71	5	11.90	16	19.75
35			8	8.69	8	8.42	9	16.07	5	11.90	12	14.81
	28		92		95		56		42		81	

Table 4 depicts the authorship pattern of contributions, volume wise.Regarding contributions by a Single Author,Volume No 114 & 115 records the highest percentage. Regarding contributions by a Double Author,Volume No 115 & 116 records the highest percentage. Regarding contributions by a Triple Author,Volume No 118 records the highest percentage. Regarding contributions by a Four Authors,equally distributed among Volumes 111,114 and 115 .

Degree of collaboration in Quantitative terms:

The study followed the same formula which is mathematically put as:

[C = NM] / [NM + NS]

Where C = Degree of Collaboration, NM = Number of Multi authored papers,NS = Number of single authored papers.

In the present study (NM = 266) (NS = 28) (NM + NS =394) Thus C = 0.675

Thus the degree of collaboration in Journal of Biosciences is 0.675 which clearly indicates its dominance upon individual contribution.

Table 5 : Contributors (Institution Wise)

Vol No	Year	University	Institution	Colleges	Miscellaneous	Total
26	2001	17	19	2	0	38
27	2002	13	17	1	0	31
28	2003	23	19	0	1	43
29	2004	26	15	0	0	41
30	2005	20	17	2	0	39
31	2006	21	13	1	0	35
32	2007	26	17	4	0	47
33	2008	17	21	2	0	40
34	2009	21	17	0	0	38
35	2010	23	18	1	0	42
		207	173	13	1	394

Table 5 depicts the geographical distribution of contributions institution-wise at the national level,followed by universities,colleges and others.It is inferred from the above table that University wise contributions were the maximum. Next comes institution wise contributions after that college wise contributions.Volume 24 has the highest contribution by universities and Volume No 28 has the highest contribution by institutions.

Table : 6 : Geographical distribution of contributions in India

S.No	Name of the State	No of Contributions	%
1	Karnadaka	49	20.94
2	New Delhi	35	14.96
3	Maharashtra	29	12.38
4	Andhra pradesh	27	11.54
5	West Bengal	21	8.97
6	Uttar Pradesh	18	7.69
7	Tamil Nadu	16	6.84
8	Himachal Pradesh	5	2.14

9	Megalaya	5	2.14
10	Punjab	5	2.14
11	jammu Kashmir	4	1.72
12	Gujarat	3	1.28
13	kerala	3	1.28
14	Mathia Pradesh	3	1.28
15	Rajasthan	2	0.85
16	Utharkhand	2	0.85
17	Assam	2	0.85
18	Haryana	1	0.43
19	Orissa	1	0.43
20	Tripura	1	0.43
21	Jharkand	1	0.43
22	Goa	1	0.43
		234	

Table 6 explains that, a study of the 234 contributions made reveals first position of Karnataka with 20.94% next to that was NewDelhi, Maharastra and Andhra Pradesh, with 14.96%,12.38% and 12.38%,11.54%.Regarding the states like Goa,Orissa,Jharkhant,Tripura the contribution share was of less percentage. A significant observation of the study is that Karnataka dominates the number of contributions.

Table : 7 : Geographical distribution of contributions in International

S.No	Name of the Country	No of Contributions	%
1	China	55	34.38
2	USA	20	12.5
3	Korea	10	6.25
4	Brazil	10	6.25
5	Iran	7	4.38
6	Europe	7	4.38
7	UK	6	3.75
8	Italy	6	3.75
9	Japan	5	3.13
10	Russia	5	3.13
11	France	4	2.5
12	Srilanka	4	2.5
13	Germany	4	2.5
14	South Africa	3	1.87
15	Croatia	2	1.25
16	Australia	2	1.25
17	Canada	2	1.25

18	Spain	2	1.25
19	Malaysia	2	1.25
20	Turkey	1	0.62
21	West Indies	1	0.62
22	Thailand	1	0.62
23	cuba	1	0.62
		160	

Table 7 shows that 59.39% of contributions came from India; 343.38 % of contributions came from China; 12.5% of contributions came from USA; 4.90% of contributions came from Korea and Brazil and 4.38% of contributions came from Iran; However,it is inferred that out of the above mentioned Twenty Four countries, India gives priority for research when compared to other countries.

FINDINGS

From the observation made in this study, the following points may be inferred:

- Majority of the contributions in the journal are by a Triple Author
- The degree of collaboration in Journal of Biosciences is 0.675 which clearly indicates its dominance upon individual contribution. Volume Number 32 (2007) has maximum articles contributed.
- Among the contributions, the maximum number of contributors is from the Universities at the national level. The national contributions are slightly more than the international contributions.
- All the contributions are with citations. It is observed that the journals are more cited documents.
- Journal also seems to be popular among the research scholars of the universities as seen from the highest number of contributions received from them.
- The average number of contributions per volume has a shown a increase in its pages.
- The number of contributions from India and China is significant.

Conclusion

Scientific Information comes in various forms. The design of the Information systems can only support the Information to be collected. The type of Information collected will vary according to the user level and capacity to digest the Information. The best yardstick to measure the efficiency of information is by scientometric analysis. The publishing trend totally depends on the productivity of contributors, pattern of contributions and the quality of information. In the year 2007 shows the maximum of contributions made in this journal.

A significant note of the study is that the majority of the articles are contributed by Triple Author and that the University wise contributions were the maximum. In

India Karnataka dominates the number of contributions than any other states.

The geographical distributions of international level shows among the 23 countries, India keeps the formidable position and gives priority for research when compared to other countries. A notable attribute of this study is that, this journal really emphasis fruitful research for the researchers.

Journal of Biosciences is possibly the topmost among Indian journals on the subject. Compared to other Indian journals its impact factor i.e. 0.370 is pretty good. For example, the impact factor of *Indian Journal of Medical Research* for the same year 1999 is 0.365. Inclusion of articles belonging to high profile areas of research by both Indian and foreigners is likely to improve the impact factor as well as the visibility of the journal a lot. Launching an Internet site helps a lot in enhancing the visibility as well as the impact factor of a journal.

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