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A SCIENTOMETRIC STUDY OF JOURNAL OF BIO-CHEMISTRY AND BIO-PHYSICS (IJBB)

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Bala, Madhu and Singh, Mahender Pratap, "A SCIENTOMETRIC STUDY OF JOURNAL OF BIO-CHEMISTRY AND BIO-PHYSICS (IJBB)" (2014). *Library Philosophy and Practice (e-journal)*. 1168.

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A SCIENTOMETRIC STUDY OF JOURNAL OF BIO-CHEMISTRY AND BIO-PHYSICS (IJBB)

by

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Abstract:

Scientometric is branch of Science. Scientometric explain about input and output resources in term of organisational structure. Scientometric is the Science of measuring and analyzing Science. Modern Scientometric is mostly based on the work of Derek J.de Solla Price and Eugene Garfield. This paper critically analyses 316 scholarly communications published in the Indian Journal of Biochemistry & Bio-Physics. Indian Journal of Bio-Chemistry and Bio-Physics, formerly known as IJBB. It is a peer reviewed, open access bio-monthly Journal published by NISCAIR. The analysis cover mainly the number of articles, form of document cited, most cited Journals etc. Study reveals that single author contributed 18 (5.7%) while the rest of 162 (51.3%) articles were contributed by Multi authors. The contributions in this Journal from India are slightly more than those from the other countries. The objectives of this study to assist the collection development in order to fulfil the needs of scientists and research scholars in the field of science and technology.

Keywords: Scientometric, Indian Journal of Bio-Chemistry and Bio-Physics (IJBB), NISCAIR.

Introduction: Science and scientific research have been growing at a faster rate during recent years. Indian Journal of Bio-Chemistry and Bio-Physics is highly helpful in the field of Biology and Chemistry and other Science related branches. They develop benchmark to evaluate the quality of information resources and package of information for decision making in Science. It provides key opportunities to researcher to publish their article with new straggles, innovation, new ideas, and new methods. Scientometric is one of the most common areas of study among the Researchers and research activity.

Biochemistry is a fascinating subject that deals with the chemical language of life, be it human, animal, plant, or microorganism. Biochemistry interfaces with Biology and Chemistry and is concerned with the Chemical processes that take place within living cells. The Science is the application of the laws of Physics to biological phenomena.

Biophysics is subject that deals with the various aspects of tools, techniques, laws and methods used in Biology and Physics and it is an interdisciplinary Science using methods

of, and theories from, physics to study biological systems. Biophysics spans all levels of biological organization, from the molecular scale to whole organisms and ecosystems. Biophysical research shares significant overlap with Bio-Chemistry, Bioengineering, agro physics, and System Biology. It has been suggested as a bridge between biology and Physics.

Genesis of the source Journal: Indian Journal of Biochemistry & Biophysics (IJBB) has been selected as the source Journal for the present study. IJBB published by NISCAIR (National Institute of Science Communication and Information Resources). The pioneering Journal was started in 1964. The Bimonthly issue of this Journal contains full papers, short notes, and rapid communications and review articles. National Institute of Science Communication & information Resources (NISCAIR) came into existence on 30 September 2002 with the merger of National Institute of Science Communication (NISCOM) and Indian National Scientific Documentation Centre (INSDOC). Both NISCOM and INSDOC, the two premier institutes of the Council of Scientific and Industrial Research (CSIR), were devoted to dissemination and documentation of Science & Technology information.

The articles published in this Journal cover all areas of research in Bio-Chemistry and Bio-Physics. Viz. bimolecular recognition, protein-protein and protein-DNA interactions vectors, gene therapy; drug targeting, drug design; molecular basis of genetic diseases; conformational studies, computer simulation, novel DNA structures and their biological implications, protein folding; enzymes structure, catalytic mechanisms, regulation; membrane biochemistry, antigen-antibody binding, neurochemistry, ageing, apoptosis, cell cycle control; hormones; ontogenesis, host-virus interactions, viral assembly and structure; intermediary metabolism, molecular basis of disease processes, vitamins, coenzymes, carrier proteins, toxicology; plant and microbial biochemistry; electrical phenomena in biological systems and so on⁽³⁾. Solicited peer reviewed articles on contemporary themes and methods in Biochemistry and Biophysics form an important feature of IJBB.

Scope and Objectives of the Study: The study covered the period during the year from 2009-2013. This critically analyses 316 Articles published in the inaugural five volumes of IJBB with 36 issues. In order to achieve this, the following objectives were formulated for the present study:

- To analyse the chronological growth of literature during 2009-2013;
- To examine the authorship pattern of the contribution;
- To identify the geographic distribution of output;
- To study the length of articles;
- To discover the subject distribution of the articles and the main areas of research;
- To identify the citation analysis of the references;
- To identify the distribution of citation by Format;
- To discover the most frequently cited Journals in the field.

Methodology: All articles of this study retrieve from “NISCAIR ONLINE PERIODICALS REPOSITORY (NOPR)”. NOPR has been implemented based on the open source digital repository system software. This has enabled NISCAIR to host online its research Journals; IJBB is covered by many national and international abstracting/indexing services, such as: Anal Abstr, Medline/Pub Med, Nutr Abstr, Sci Cit Ind, Rev Appl Entomol, Rev Plant Path, Vet Bull, Trop Dis Bull, etc. Abstracts of papers published in IJBB are also available free online i.e website: <http://www.niscair.res.in>. All the data were subsequently examined, observed, analysed and tabulated for making observations are used as a source.

Review of Related Literature: Kumar (et.al), (2013) in this Paper analyses the growth and development of Bibliometric and Scientometric research in physics and engineering field as per Inspec Database (1999-2008) during 1999-2008. Authorship and Collaboration Trend was Towards Multi-Authored Papers. Regolini, Janne and Antony (2013), studied a Bibliometric study of first generation citations from formation science. Publication data from scopus were used. This study confirms that it is possible to observe the evolution of a new transdiscipline by analysing the citations to papers from its flagship Journal. Nandi, Amitava, Bandyopadhyay, and Kumar, (2013), Bibliometric Analysis for 160 theses and 739 thesis articles collected from the Botany department at the University of Burdwan in eight subdivisions of botany during 1960-2000 has been carried out to determine year wise productivity, authorship pattern and collaboration. Kalaiappan, Kaliyaperumal and Rajasekar (2010), the study is a Bibliometric analysis of remarkable contributions of Prof. G.N. Ramachandran (Popularly Known As Gnr), An Eminent Biophysicist and Crystallographer. It is necessary to review the contributions made by renowned Indian scientists so as to understand the nature and magnitudes of their contributions to a particular field of study. The paper examines the contributions of GNR in the fields of biophysics and crystallography, magnitude of his collaborations, and year-wise distribution of his productivity. S. Nattar, (2009), Scientometric analysis of 829 Articles Published in the Indian Journal Of Physics During The Year 2004- 2008 are taken up to observe the distribution of contributions, authorship pattern, geographical distribution of contributions and the number of pages used in each volume. Results indicate that highest numbers of papers have been written by co- authors. The growth and popularity of this Journal is found to show an upward trend.

Analysis and Interpretation of Data: The data analysis and discussion of the study are given below:

Table-1 Chronological Growth of Articles

Year	Vol. No.	No. of Articles	Percentage
2013	50	72	22.78
2012	49	59	18.67
2011	48	58	18.35
2010	47	58	18.35
2009	46	69	21.83
Total		316	100

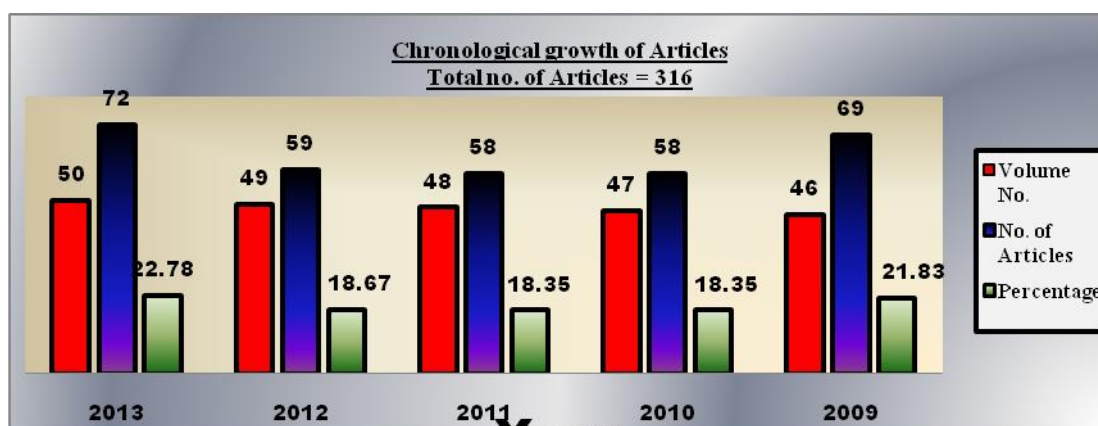


Fig: 1

Table 1 portrays that the Journal published 46-50 volume no and 36 issues published during the period of study i.e. from 2013 to 2009. The above table shows that the maximum

numbers of Articles 72 (22.78%) were published in the year 2013 and minimum in the year 2011 and 2010 is 58 (18.35%).

Table-2 Authorship Pattern

Year	2013	2012	2011	2010	2009	Total	Percentage
Single Author	5	5	4	1	3	18	5.7
Two Author	12	06	11	13	15	57	18
Three Author	13	15	16	14	21	79	25
Multi Author	42	33	27	30	30	162	51.3
Total						316	100

Table 2 depicts that the authorship pattern of contributions by a multi author, with nearly half having three. Anyhow it may be concluded that the Multi-author contributions has the maximum percentage.

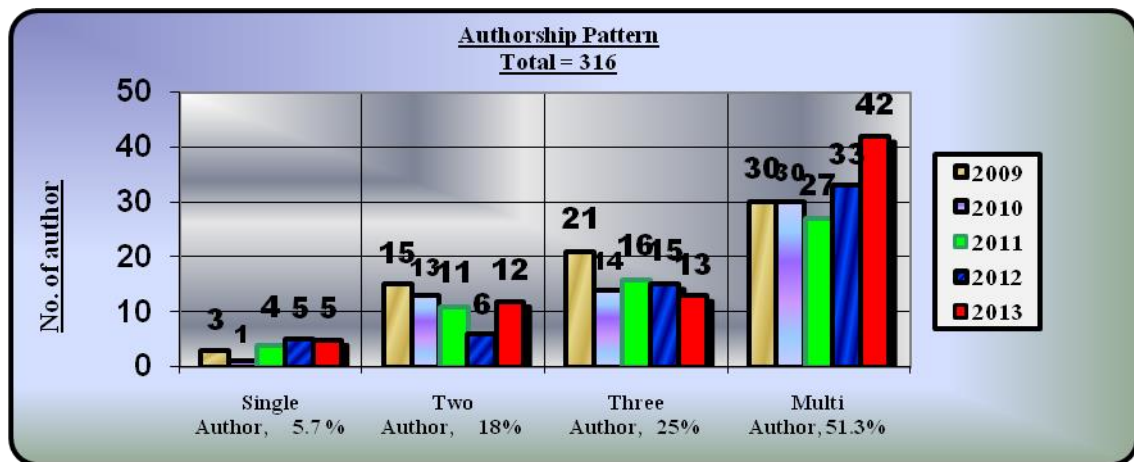


Fig: 2

Table-3 Geographical Distribution of Contributors at International Level

Rank no.	Name of the Country	Total no of contributions	Percentage
1	India	768	68.9
2	China	170	14.9
3	Turkey	42	3.7
4	USA	35	3.06
5	Korea	35	3.06
6	Iran	19	1.7
7	Poland	15	1.31
8	Pakistan	14	1.22
9	Malaysia	13	1.1
10	Australia	12	1.05
		1141	100

Table 3 shows that 68.9 % that contributions come from India; 14.9 % of contributions came from China; 3.7% of contribution came from Turkey; 3.06% of contributions came from U.S.A and Korea; 1.7% of contributions came from Iran; countries last lowest 1.05% contribution from Australia. A significant observation of the study is that India dominates the number of contributors at international level.

Table-4 Page Wise Distribution of Articles

Pages	2009	2010	2011	2012	2013	Total	Percentage
1-3	4	04	-	01	-	09	2.84
3-6	37	33	29	19	36	154	48.7
7-10	24	21	25	31	29	130	41.1
10-15	03	-	04	08	07	22	00.7
>15 Page	01	-	-	-	-	01	0.36
Total	69	58	58	59	72	316	100

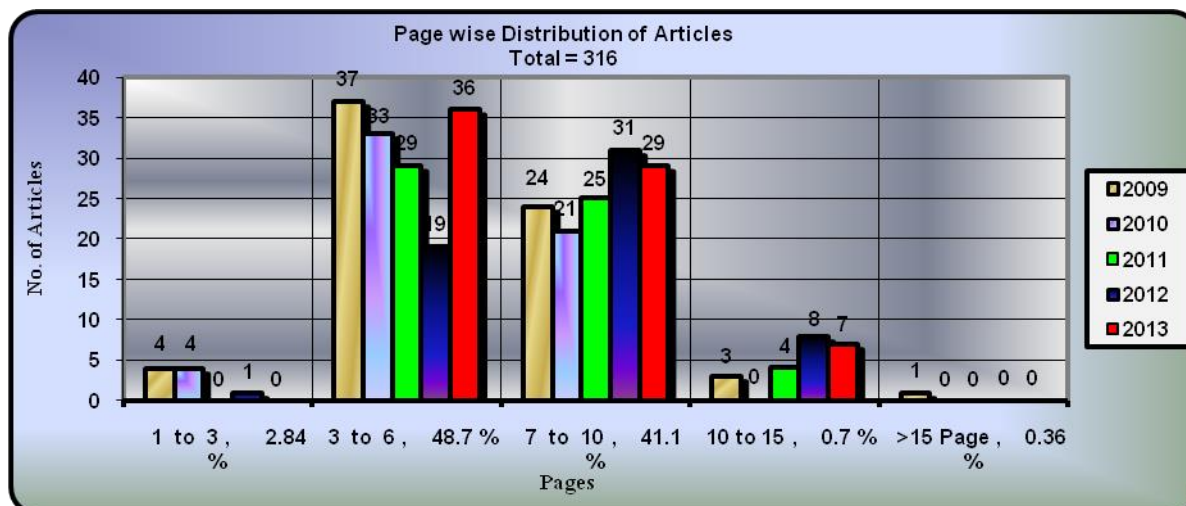


Fig: 4

Fig.4 reveals that the majority of articles 154 (48.7%) have the length of 3-6 pages followed by 130 (41.1 %) articles with 7-10 pages, 22 (00.7%) articles with 10-15 pages (2.84%) with 09 pages and the remaining (0.36%) with 01 page.

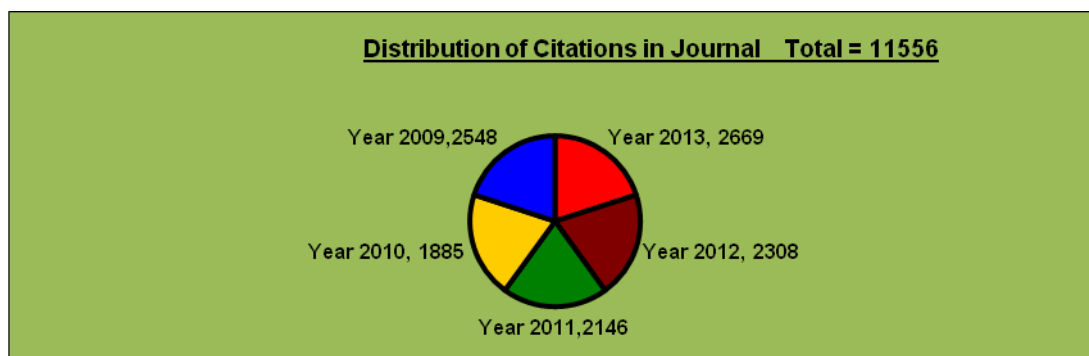
Table-5 Subject Wise Distribution of Articles

Sl. No.	Subject	No. of articles	Percentage	Cumulative Percentage
1	Pharmacology	97	30.7	30.7
2	Bio-Chemistry	61	19.3	50
3	Bio-Technology	48	15.2	65.2
4	Bio-Physics	26	8.22	73.42
5	Applied Chemistry	25	7.91	81.33
6	Genetics	22	6.96	88.29
7	Micro-Biology	15	4.74	93.03
8	Applied Physics	13	4.11	97.14
9	Physiology	05	1.6	98.74
10	Plant Biology	04	1.26	100
Total		316	100	100

Shown in table 05 the subject classification gives some idea of newly- developed specialised branches of Bio-Chemistry and Bio-Physics during 2013 to 2009. The table 07 above showed that majority of the contributions appeared under Pharmacology 97 (30.7%) followed by Bio-Chemistry 61 (19.3 %), and Bio-Technology 48 (15.2 %), Bio-Physics 26 (8.22%) and Applied Chemistry 25 (7.91%), Genetics 22 (6.96%), Micro-Biology 15 (4.74%), and Applied Physics 13 (4.11%) , Physiology 05 (1.6%), and Plant Biology is 04 (1.26%).

Table: 6 distributions of Citations in Journal

Sl. No.	Year	Number of citations
1	2013	2669
2	2012	2308
3	2011	2146
4	2010	1885
5	2009	2548
	Total	11556

**Fig: 6****Table-7 Distribution of Citations by Format**

Sl.No.	Forms of documents	No of citations	Percentage
1	Journals	5220	45.2
2	Books	3110	26.9
3	Conference proceedings	2102	18.18
4	Others (Thesis, Reports, Dissertation, etc)	1124	9.72
	Total	11556	100

The citation was classified into various bibliographic forms such as Journals, books, conference proceedings, and other sources. Based on analysis it was found that contributors make use of Journals articles the most that is 5220 (45.2%) citations. This is followed by books 3110 (26.9%) and Conference proceedings 2102 (18.18%) citation. The remaining 1124 (9.72%) citations are from other sources.

Table-8 Ranking of Top 10 Journals by Impact Factor

Sl. No.	Name of Journals	Publishing Country	Impact Factor
1	Journal of Bio- Chemistry	USA	3.905
2	The Journal of Bio- Chemistry	Japan	2.719
3	Indian Journal of Bio- Chemistry and Bio-Physics	India	1.026
4	Journal of Agriculture and food Chemistry	Washington	2.906
5	Journal of Enthopharmacology	USA	3.322
6	Clinical Chimica Acta	USA	2.669
7	Indian Journal of Pharmacology	India	0.583
7	Journal of Molecular Biology	UK	3.888
8	Nature	London	37.162
9	Journal of Clinical investigation	USA	12.812
9	Journal of Acquired Immune deficiency Syndrome	USA	4.653
10	Journal of Nutrition	USA	4.2

*Source: Google, Journal's site

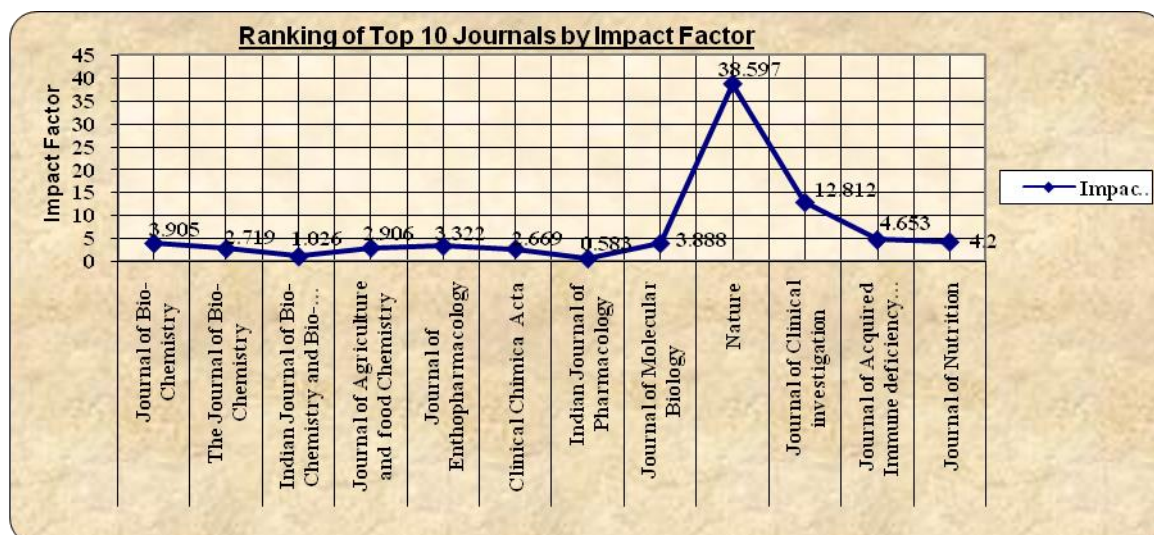


Fig: 7

Impact factor is one of the quantitative tools for ranking, evaluating, categorizing, and comparing Journals. It is a measure of the frequency with which the "average article" in a Journal has been cited in a particular year or period.

Findings: From the observation made in this study, the following points may be inferred: Findings reveals that 316 articles were published during the period of study (2009-2013). The maximum number of articles 72 was published in 2013 and minimum number of articles 58 was published in 2011. The maximum number of contributions is multi authored collaborations with 51.3%, most of contributions 68.9% from India. Scholarly nature of source Journal has been further ascertained from increasing citations and reference usage trend. The study revealed that majority of the authors preferred Journals as the source of information providing the highest number of citations and Journals are most cited form of communication amongst the scientists and Research Scholars. The maximum number of articles 48.7 % has the length of 3-6 pages and minimum no of articles 0.36% has the length of 15 pages. Maximum number of special issues 5 was published during 2013-2009 on topic biomedical Science, physiology, molecular mechanism etc. Maximum number of contributor is from the Universities at the International level 62.6%. 11556 references and 1855 keywords used by the contributors out of 316 article. A highly cited Journal in IJBB by contributors is Journal of Bio-Chemistry.

Conclusion: The findings of the study showed that Scientometric study is reliable and practical method to provide reasonably accurate information on the use of Bio-Chemistry and Bio-Physics literature by any researcher. Publishing research in high quality Journals is an integral part of academic life. The Scientometric study of the Journal "IJBB" during 2013-2009 shows trend of growth in contributions and average number of contributions more comparison to other Journals. All the studies point towards the merits and weakness of the Journal which will be helpful for its further development. This study helps to improve scientific documentation, information and communication activities by quantitative analysis of library collection and services. It can also serve as a feedback to librarians in the selection and acquisition of documents most useful to researchers in Bio-Chemistry and Bio-Physics. Today we conclude that in present scenario research is done in almost all the branches of knowledge, especially in Science and Technology.

Acknowledgment

I am extremely thankful to Dr. M.P. Singh for his valuable suggestions and corporation. In this regard I am also thankful to my family who provided me these opportunities, supported, and strengthen me at every face of this study.

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