A STUDY ON LITERATURE GROWTH IN CYANOBACTERIA : A BIBLIOMETRIC APPROACH

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ABSTRACT

In this article, the authors have analyzed the literature growth on Cyanobacteria for the period from 2000 to 2018. Further the top 10 authors contribution, country-wise distribution, language-wise output, subject-wise distribution and ranking of journals are also analyzed.

Key words: Bibliometric, Cyanobacteria, Journal Ranking, Country-wise distribution, Language-wise.

Introduction

Information potential has been increasing day by day exponentially in large quantities and in complexity of various subjects with inter-disciplinary and multidisciplinary nature and is being called "information explosion". The availability of large number of books, rise of middle class, development of public libraries, more people becoming literates, passing of renaissance, the advent of reformation, continued interest in humanism, the beginning of scientific progress and industrial revolution and political revolutions led to "information explosion". Prior to introduction of the term Bibliometric by Alan Pritchard, the `Librametry' was suggested by Ranganathan (1948) when the ASLIB Conference was held in in Leamington Spa on the lines of Biometry and Econometry etc. Schrader (1981) has defined the Bibliometrics as "the scientific study of recorded discourse. William Gary Potter (1981) has stated that "Bibliometrics is the study and measurement of the publication pattern of all the forms of written communication and their authors".

Literature Review

Gianwati Thakran (1980) has analyzed the Growth and development of bibliographic services in social sciences in India and UK during 1970s' gives a detailed account of the development of bibliographical services in India and the United Kingdom and the types of services

including compilation of bibliographies, indexing and abstracting services, documentation, preparation of union catalogues and lists Current Awareness Services etc.

Ranganathan and Balasubramani (2014) have evaluated the literature output of the Green Energy Research in India and indexed in the Web of Science from 1993 to 2013. It highlights the highest publication of 189 in the year 2012 with 170 Global Citation Services and the lowest publication is 18 in 1999 with 83 Global citation scores.

Jayaprakash (2015) has studied the Bibliometric analysis on Emerald Journal on Cloud Computing. The data were collected from Emerald website for the period from 2000 to 2014 in 781 articles. All the data were calculated in excel. The highest number of articles were published in the year 2013 totalled 181 (23.17%). Research papers produced in the nature of records, totalled 353 (45.19%) and journal's list Library Hi Tech News totalled 87 (10.92%). Based on Authorship pattern analysis, Single authors have written 287 (36.74%) with articles holding the first position, followed by double authors with 169 (21.63%), three authors with 123 (15.73%), and the lowest number of articles written with eight authors totalled 03 (0.38%).

Padma, and Ramasamy, (2016) have analyzed the e-library Science Research Journal considering 521 articles published from 2013 to 2015 around three years. Of the total number of 521 articles included in the present study, 280 papers had the length of 6-10 pages, followed by 151 with 1-5 pages, 77 with 11-15pages, 10 with 16-20 pages, and 3 with 20 pages. Totally, 160 articles had 1 to 5 charts and tables. Most of 163 records used 11-20 references in the study. Majority of the references (1376, 22.19%) were published under two authors pattern.

Sivakumaran and Sanjeevi (2018) have analyzed 4,121 articles published in the printed version of Current Science journal during the period from 2013 to 2017. The highest number of publications (877) articles was published in the year 2015 and lowest number of (756) articles were published in 2014. India has contributed 679 articles compared to China and the United States of America. The multiple authors contributed more articles compared to the single and two authors.

Arulmozhi and Sanjeevi (2019) found the Estuarine ecosystem as the most protective ecosystem in the marine environment. The study was on important functions like feeding, breeding for few marine organisms. It has a buffer zone of the marine ecosystem and protects the organisms from the natural calamities. The study attempted to analyze the authorship-pattern of the published

documents on estuary research for the period from 2015 to 2018. The primary data, for the present study, were collected from Web of Science database and, totally, 11805 records were retrieved for analysis. The analysis included the year-wise publications, estuary contributions by Top 10 authors, Authorship pattern, Average Author per Publication and Degree of collaborations in the chosen field. The results showed the publications of maximum number of 3159 articles in 2018. With Zhang J has contributed 11037 articles and the three author contribution is dominant (2965 publications). The range of Average Author per Publication was 3.57 in 2018. The mean value of the Degree of Collaboration was 0.89.

Ravichandran and Ramani (2020) "Author Productivity and Citation of Rural Education Research Output". The study has analyzed Author Productivity and Citation of Rural Education Publication indexed in the Web of Science database. "Rural Education" as a search term in the all field, fetched 18860 records and the period of coverage from 2000 to 2019. It was also observed that the most productive 30 author was Rozelle, S. with 81 papers on rural education research (0.4%), and TLCS 293, TGCS 1203, TLCR 290 papers were published in this research domain. Three authored contribution (15.86%) was found to be most prime, the average degree of collaboration was impressive 0.8787911. From 2000 – 2003, a total of 1357 publications were published in the field of rural education research with 259 single-authored papers (CAI 157.47), 277 two authored papers (CAI 129.28) and 821 more than two authored articles.

Objectives:

The major objectives of the present study are to:

- examine the year-wise literature growth on cyanobacteria.
- identify the contributions of top-10 prolific authors
- study the countries-wise distribution
- analyze the language wise output.
- analyze the subject-wise distributions on the published articles.

Results

The years-wise literature growth on Cyanobacteria during the study period is analyzed and presented in Table-1.

Table-1 Yearly Literature Growth on Cyanobacteria

S. No	Year	Publications	Percentage
1	2000	560	2.27%
2	2001	642	2.60%
3	2002	696	2.82%
4	2003	805	3.26%
5	2004	800	3.24%
6	2005	965	3.91%
7	2006	1,027	4.16%
8	2007	1,066	4.32%
9	2008	1,135	4.60%
10	2009	1,181	4.78%
11	2010	1,270	5.14%
12	2011	1,479	5.99%
13	2012	1,558	6.31%
14	2013	1,680	6.81%
15	2014	1,729	7.00%
16	2015	1,861	7.54%
17	2016	2,054	8.32%
18	2017	2,040	8.26%
19	2018	2,141	8.67%
Total		**24,689**	

From the above table, it is clearly noticed that out of 24,689 records the highest number of articles (2141) published in the year 2018 with 8.67% followed by 2054 records in the year 2016 with 8.32% and 2040 records in the year 2017 with 8.26%. The lowest number of 560 records published in the year 2000. The publication trend shown during the study period is an increasing trend.

Table - 2 Top 10 Prolific Authors

S. No	Author	Publications	Rank
1	Neilan BA	131	1
2	Sivonen K	126	2
3	Vasconcelos V	125	3
4	Pakrasi HB	94	4
5	Gerwick WH	91	5
6	Bryant DA	90	6

7	Hess WR	88	7
8	Hagemann M	86	8
9	Codd GA	83	9
10	Komarek J	83	9

Table-2 shows the top 10 prolific authors contributions on Cyanobacteria research. Out of ten authors, Neilan B A has contributed 131 publications and occupied first position. Sivonen K and Vasconcelos V have contributed 126 and 125 publications to occupy the second and third position. Codd G A and Komarek J have contributed 83 articles each and occupy the 9th and 10th positions respectively.

The country-wise distribution on cyanobacteria publications during the study period was analyzed and given in Table-3.

Table - 3 Countries wise Distribution

S. No	Country	Publications	Percentage
1	USA	6,312	25.57%
2	China	3,129	12.67%
3	Germany	2,588	10.48%
4	Japan	1,829	7.41%
5	France	1,374	5.57%
6	Spain	1,271	5.15%
7	Australia	1,254	5.08%
8	India	1,239	5.02%
9	England	1,226	4.97%
10	Canada	1,053	4.27%

From the above table, among top 10 countries, the USA has contributed 6312 articles with (25.57%) on cyanobacteria and occupies first position. China and Germany have contributed 3129 and 2588 records during the study period and occupy second and third positions respectively. India holds 9th place with the contribution of 1239 records. Canada has contributed 1053 records with 4.27% and occupies the 10th position.

Table – 4 Language wise Output

S. No	Language	Publications	Percentage
1	English	24,454	99.05%
2	Spanish	64	0.26%
3	Portuguese	37	0.15%
4	Chinese	35	0.14%
5	Russian	26	0.11%
6	French	22	0.09%
7	Polish	16	0.07%
8	Japanese	13	0.05%
9	German	12	0.05%
10	Czech	4	0.02%

Table-4 has shown the language-wise distributions on cyanobacteria during the study period. The maximum number of articles (24454) was published in English language with 99.05%. The Spanish and Portuguese languages occupied second and third positions with the publication of 64 and 37 records respectively. The publications of other languages like French, Polish, Japanese, German and Czech is below 1.0 percent.

Table - 5 Ranking of Journal

S. No	Journal Name	Records	Rank
1	Hydrobiologia	325	1
2	Applied And Environmental Microbiology	269	2
3	Journal of Phycology	233	3
4	Toxicon	220	4
5	Photosynthesis Research	212	5
6	Proceedings of the National Academy of Sciences of the United States of America	206	6
7	Plant and Cell Physiology	178	7
8	Limnology and Oceanography	171	8
9	Environmental Microbiology	169	9
10	Journal of Bacteriology	159	10

From the above table-5, the maximum numbers of articles (325) were published in Hydrobiologia Journal. The other Journals like Applied and Environmental Microbiology, Psychology, Toxicon ranked between 2nd and 4th Rank. The minimum number of contributions (159 articles) was found in the Journal of Bacteriology which ranked 10.

Table -6 Zipf's law for occurrence of word count

S. No	Word	Records	Rank of the Word
1	Cyanobacteria	2855	1
2	Cyanobacterial	1275	2
3	Cyanobacterium	1085	3
4	Lake	841	4
5	Phytoplankton	714	5
6	Water	692	6
7	PCC	686	7
8	Analysis	613	8
9	Microcystis	605	9
10	Effects	602	10

Table-6 illustrate the Zipf's law it is a phenomenological law related to rank the data frequencies, primarily, linguistic corpora as it says the most frequent word will occur approximately twice as often as the second most frequent word. Regarding the word frequency of the whole document, a few words are repeatedly used here by the Cyanobacteria Scientists. For this analysis, the research has taken top 10 frequently occurring words, the sample data, their total citation score and the global citation score. The word Cyanobacteria has been repeatedly used for 2855 times which holds the first rank, Cyanobacteria was used for 1275 time which holds the place second and Cyanobacterium occupies the third place which was used for 1085 times and the words `effects' holds the last place with 602 entries.

Findings:

Based on the analyzed results, the study revealed that:

- ✓ The yearly growth on cyanobacteria publications during the study period is in positive trend.
- ✓ The United Stated of America was published 25.57% (6312 records) compared to other nine countries.
- ✓ 99.05% of the documents published in English language only.
- ✓ The Journal `Hydrobiologia' has published 325 records during the study period and occupied first position.

Conclusion

The present concludes that the contributions of Indian scientists contributions are very minimal (1,239 records) compared to other countries. Hence they should concentrate to publish their research articles in the indexed journals for more visibility to public.

References:

Arulmozhi. V., and Sanjeevi. K. (2019). A study on Authorship pattern in Estuary Research (2015-2018). International Journal of Psychosocial Rehabilitation, 23(05): 1186 – 1190.

Jayaprakash B. (2015). Bibliometric analysis of literature published in emerald journals on cloud computing. International journal of Computational Engineering and Management, 18 (1): 21-26.

Padma, P., & Ramasamy, K. (2016). Content and references metrics: a Bibliometric study of e-library science research journal. Journal of Advances in Library and Information Science, 5 (4): 310-31.

Potter, W.G. (1981). Introduction to Bibliometrics. Library trends, 30; 151.

Ranganathan SR. Proceedings of the Aslib's Ann. Conference, Leamington Spa, Great Britain, 1948.

Ranganathan, C. and R. Balasubramani. (2014). Scientometrics profile of research activities on green energy: an Indian perspective. International Journal of Research in Applied, Natural and Social Sciences, 2 (1) : 23-30.

Ravichandran, P., and Ramani, M. (2020). Author Productivity and Citation of Rural Education Research Output. Journal of Advances in Library and Information Science, 9(4): 131 – 136.

Schrader AM. "Teaching bibliometrics". Library Trends, 1981; 30(1): 151-172.

Sivakumaran, K. and K. Sanjeevi, (2018). Scientometric analysis of research contributions in Current Science Journal (2013-2017). International Journal of Information Retrieval and Management, 6 (11): 34-36.

Thakran, Gianwati. (1980). Growth and development of bibliographical services in social sciences in India and U.K. during 1970's. Delhi: The author.

Vyas, S.D.(1992). Social science information in India: efforts towards bibliographic control. New Delhi: concept publishing company.