

## **The bibliometric investigation of the Journal of Applied and Environmental Microbiology**

**A. Rubinandhini**

Ph.D. Research Scholar  
Department of Library and Information Science  
Periyar University, Salem-11.  
E mail: jarubi22@gmail.com

**Dr. P. Gomathi**

Assistant Professor  
Department of Library and Information Science  
Periyar University, Salem-11.

***Abstract** – The present study discussed on the basic bibliometrics analysis. Applied and Environmental Microbiology is a biweekly peer-reviewed scientific journal published by means of the American Society for Microbiology. It was established in 1953 as Applied Microbiology and obtained its current name in 1975ASM's undertaking is to promote and move forward the microbial sciences. The present bibliometrics study was 4985 scholarly research articles published in 'Applied and Environmental Microbiology Journal, during the period 2001-2015. The collected data is analyzed with the help of 'Bibexcel tool' and Histcite. The references were collectively from Mendeley. The erudition also applied statistical tools such as Authorship pattern, Relative Growth Rate, Time Series Analysis, Zipf Law, and Exponential Growth Rate.*

**Keyword** - Bibliometrics, Applied and Environmental Microbiology, Web of science, Bibexcel, Authors productivity.

### **INTRODUCTION**

Bibliometric is the category of investigate method; it is an emerging area of research in the Library and Information Science field. The term “bibliometrics” is coin from two words “biblio” and “metrics”. The word biblio is resultant from the understanding of a Latin and Greek word biblion-means a book or paper, metrics indicate the science of metre i.e. measurement.

### **REVIEW OF LITERATURE**

**Thirumagal, A. (2013)<sup>1</sup>** this study deal with the bibliometrics study on the publication of “Osteoarthritis” explore. The records are together from Pub Med resource MEDLINE for the interlude of 2001 to Osteoarthritis 2012. Total digit of records for this study was 31,465. Osteoarthritis is a progressive disease, signs and symptoms slowly worsen over time. However, available treatment may help in the midst of pain and swelling (inflammation), as well as keeping the patient mobile and full of zip. The together data were analyzed with the help of ‘Bibexcel tool’.

**Rubinandhini, A., & Gomathi P (2015)<sup>2</sup>** this study focuses on the journal from the Annals of Library and Information Studies. This study covers the total number of 324 articles studied only the one journal with five years (2005 to 2014). This paper discusses on authorship pattern, citation analysis, Publication Efficiency Index, length of articles, relative growth rate,

Distribution of year wise citation analysis, degree of collaboration, country wise distribution of publications, and time series analysis of total authored papers also.

**Gomathi.P., & Rubinandhini, A. (2016)<sup>3</sup>** this study evaluates the high blood pressure delve into output from the year 2011-2015. The statistics were downloaded from web of science catalog which was maintained by Thomson Reuters. Total number of records was 1152. The result of such studies may be very useful for the follow a line of investigation administrators, policy makers and funding agencies. High blood pressure is a progressive disease, signs and symptoms slowly worsen over time. There is no change to do well. The collected data were analyzed with the help of 'Bibexcel tool'. The study also applied statistical tools such as Authorship pattern, Relative Growth Rate, Citation analysis.

**Rubinandhini, A., & Gomathi, P. (2017)<sup>4</sup>** the study identification of the publication and authorship patterns in the Journal of Applied and Environmental Microbiology an open admittance journal from 2006-2010. Authorship pattern Productivity is one of the important aspects in the Bibliometric analysis. Applied and Environmental Microbiology is a biweekly peer-reviewed scientific journal available by the American Society for Microbiology. This category of research method is an emerging area of research in the library and information field with a sample of 5316 articles collect from Applied and Environmental Microbiology Journal during 2006-2010. This study provides the insights and development of the journal towards excellence.

#### **OBJECTIVES OF THE STUDY**

- To find out the Year wise distribution of publications in AEMJ research
- To examine the Growth of Literature - Time Series Analysis
- To identify the Relative Growth Rate and Doubling Time analysis on AEMJ research
- To calculate the Year wise Authorship pattern of AEMJ research output

#### **METHODOLOGY & LIMITATION OF THE STUDY**

The data for the learning were retrieving from web of science database, which is a scientific and indexing service maintained by Thomson Reuters. The Applied and Environmental Microbiology Journal research amount produced from the year 2001-2015. For this cram bibliographic detail such as author, document type, collaboration, etc. was analyzed using bibexcel and Histcite. Bibexcel is a software put together used for bibliometric analysis and information visualization. The collected data were analyzed with the bib excel, Mendeley, Manual, Microsoft Excel Sheet and presented in the outward appearance of tables.

**Table 1 - Year wise distribution of publications in AEMJ research**

<b>Years</b>	<b>Records</b>	<b>Percentage</b>
2001	847	5.5
2002	890	5.8
2003	1033	6.8
2004	1009	6.6
2005	1206	7.9
2006	1088	7.1
2007	1069	7.0
2008	1036	6.8
2009	1043	6.8

2010	1080	7.1
2011	1158	7.6
2012	1147	7.5
2013	981	6.4
2014	837	5.5
2015	867	5.7
<b>15291</b>	<b>100</b>	

Table 4.1 show that year wise delivery of publication on the journal of Applied and Environmental Microbiology Journal research during the research period on 2001 to 2015 (15 years) a total of publications 15291 were available. The peak number of publications were 1206 (7.9%) in the 2005 and values were scale and being first position. The second highest number of publications 1158 (7.6%) in the year of 2011. follow by 1147 (7.5%) were 2012, 1088 (7.1%) were 2006. And the buck publications are 837 (5.5%) articles in the year of 2014. However, there was a greater part of the article published in the year of 2011 were 1157 (7.6%) of records.

**Table – 2 Growth of Literature - Time Series Analysis**

Year	Records	X	X <sup>2</sup>	XY
2001	847	-7	49	-5929
2002	890	-6	36	-5340
2003	1033	-5	25	-5165
2004	1009	-4	16	-4036
2005	1206	-3	9	-3618
2006	1088	-2	4	-2176
2007	1069	-1	1	-1069
2008	1036	0	0	0
2009	1043	1	1	1043
2010	1081	2	4	2162
2011	1157	3	9	3471
2012	1147	4	16	4588
2013	981	5	25	4905
2014	837	6	36	5022
2015	867	7	49	6069
<b>Total</b>	<b>15291</b>		<b>280</b>	<b>73</b>

Straight line equation is applied to disembarck at estimate for future growth beneath the Time Series Analysis.

Straight Line  $Y_c = a + bX$ :

Since  $\sum x = 0$

$$a = \frac{\sum Y}{N} = \frac{15291}{15} = 1019.4$$

$$b = \frac{\sum XY}{\sum X^2} = \frac{73}{280} = 0.26$$

Estimated prose in 2020 is when  $X = 2020 - 2008 = 12$   
 $= 1019.4 + 0.26X \ 12$   
 $= \mathbf{1022.52}$

Estimated prose in 2025 is when  $X = 2025 - 2008 = 17$   
 $= 1019.4 + 0.26X \ 17$   
 $= \mathbf{1023.82}$

The predicted value of literature output for the year 2020 is 1022.52 and the predicted literature output for the year 2025 in 1023.82.

On the function of formula of time series analysis and subsequently, from the results obtained separately from the results obtained for the years 2020 and 2025, it is found that the future trend of growth of follow a line of investigation articles in Applied and Environmental Microbiology Journal research India output possibly will take on increasing inclination during the year to come. The inference from the calculations proved that the positive augmentation at the research writing productivity of Applied and Environmental Microbiology Journal investigate.

**Table - 3 Relative Growth Rate and Doubling Time analysis on AEMJ research**

Years	Records	Cumulative no. of Records	W1	W2	R (a) (W2-W1)	Mean R (a) (1-2)	Doubling Time Dt (a)	Mean Dt(a) (1-2)
2001	847	847	-	6.74	-	8.27	-	0.48
2002	890	1737	6.79	7.46	0.67		1.03	
2003	1033	2770	6.94	7.93	0.99		0.7	
2004	1009	3779	6.92	8.24	1.32		0.53	
2005	1206	4985	7.10	8.51	1.41		0.49	
2006	1088	6073	6.99	8.71	1.72		0.40	
2007	1069	7142	6.97	8.87	1.9		0.36	
2008	1036	8178	6.94	9.01	2.07		0.33	
2009	1043	9221	6.95	9.13	2.18	15.02	0.32	0.28
2010	1080	10301	6.99	9.24	2.25		0.31	
2011	1158	11459	7.05	9.35	2.3		0.30	
2012	1147	12606	7.04	9.44	2.4		0.29	
2013	981	13587	6.89	9.52	2.63		0.26	
2014	837	14424	6.73	9.58	2.85		0.24	
2015	867	15291	6.77	9.64	2.87		0.24	
<b>Total</b>	<b>15291</b>	-				<b>11.65</b>		<b>0.38</b>

Table 3 Shows that the Relative Growth Rate of total contribution published had gradually augmented. The growth rate in 0.67 in 2002, which is increased up to 2.87 in 2015. The mean relative growth rate for the duration of the period 2001-2008 is 8.27 and in was increased during the year 2009-2015 is 15.02. The overall study period has witness a mean relative intensification rate in 11.65. In general relative growth rate of publications of all sources in Applied and Environmental Microbiology Journal research output has shown an ever-increasing trend.

The mean doubling time during the period 2001-2008 is 0.48 and for 2009-2015 is 0.28. The taken as a whole cram period has witnessed a mean doubling time as 0.38. In generally

doubling time of publications of all sources in Applied and Environmental Microbiology Journal make inquiries output has shown a decreasing trend.

**Table – 4 Year wise Authorship pattern of AEMJ research output**

Authors	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	%
One author	11	10	13	7	7	9	10	8	6	2	8	8	5	4	5	113	0.7
Double authors	134	108	145	114	130	113	101	93	99	72	92	72	75	66	37	1451	9.5
Three authors	182	188	211	191	224	184	162	155	174	169	150	176	123	89	108	2486	16
Four authors	175	168	217	228	241	223	209	198	198	202	201	182	152	131	120	2845	19
Five authors	146	167	179	172	221	170	187	183	173	191	183	196	163	145	129	2605	17
Six authors	89	113	118	117	138	151	130	144	129	150	180	173	135	108	140	2015	13
Seven authors	53	61	68	69	106	84	120	88	98	110	127	124	110	86	99	1403	9.2
Eight authors	21	33	37	57	64	62	71	61	64	70	79	94	79	78	68	938	6.1
Nine authors	22	21	21	21	37	31	24	48	35	35	52	46	52	41	63	549	3.6
Ten authors	4	15	11	15	10	18	31	21	27	31	31	24	30	35	41	344	2.3
> 10 authors	10	6	13	18	28	43	24	37	40	48	55	52	57	54	57	542	3.5
Total	847	890	1033	1009	1206	1088	1069	1036	1043	1080	1158	1147	981	837	867	15291	100

Table 4 examine that the authorship pattern is analyze to determine the category of research and their percentage; it is establish that the authorship pattern of Applied and Environmental Microbiology Journal research during 2001 to 2015, the uppermost number of records in the year of 2005 produced by four authors 241, records. This is followed by 228 records were produced by four authors from 2004, 223 records were produced by four authors from 2006 and 221 records were produced by five authors from the year of 2005 respectively.

The buck height above sea level of output is experimental in the year of 2010 was 2 records written by single author. Among the authorship pattern, the majority of the articles were 2845 is written by four authors, and the minimum level is 113 written by single authored article. Here the overall total number of authors 79620 during the research on Applied and Environmental microbiology journal research.

## FINDINGS AND CONCLUSION

- Greater part of the article published in the year of 2011 were 1157 (7.6%) of report.
- The time series analysis wise Applied and Environmental microbiology journal disappearing to the greater than ever level on the expectations for the estimation year of 2020 and 2025.
- The mean relative growth rate for the duration of the period 2001-2008 is 8.27 and in was increased for the duration of the year 2009-2015 is 15.02. In general relative growth rate of publications of all sources in present follow a line of investigation output has shown an ever-increasing inclination.
- The mean doubling time during the interlude 2001-2008 is 0.48 and for 2009-2015 is 0.28. The present output has shown a decreasing development.
- The majority of the articles were 2845 is written by four authors, and the minimum level is 113 written by single authored article. Here the overall total number of authors 79620 during the research on Applied and Environmental microbiology journal research.

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