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Authorship Patterns and Collaborative Research in the Journal of Biofuels, 2010-2016

Kotti Thavamani

*Regional Medical Library, The Tamilnadu Dr. M.G.R Medical University, No. 69, Anna salai, Guindy, Chennai – 600 032.,
kottithavam@gmail.com*

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Authorship Patterns and Collaborative Research in the Journal of Biofuels, 2010-2016

Kotti Thavamani,

Regional Medical Library, The Tamil Nadu Dr. M.G.R Medical University

69, Anna sasai, Guindy, Chennai – 600032. Tamil nadu, INDIA

kottithavam@gmail.com

Abstract: This article analyzed the various components of the articles published in the Journal of Biofuels from 2010 – 2016. Various quality aspects of the 106 research articles and 376 authors were examined by growth of contributions by year and issue, authorship patterns by year and volume, authorship patterns, author productivity, authorship patterns by global, most prolific contributors and degree of collaboration. The average number of authors per paper is 3.462 and the average productivity per author is 0.288. The average degree of collaboration is 0.933 during the period under study. The majority 99 (93.396%) of the total contributions represents collaborative research.

Key Words: Bibliometrics; Publication Analysis; Authorship Patterns; Degree of Collaboration; Research Trends, Biofuels; Collaborative Research.

Introduction

According to Wikipedia, the free encyclopedia, Bibliometrics, is statistical analysis of written publications, such as books or articles. Bibliometric methods are frequently used in the field of library and information science, including scientometrics. For instance, bibliometrics are used to provide quantitative analysis of academic literature or for evaluating budgetary spending. Many research fields use bibliometric methods to explore the impact of their field, the impact of a set of researchers, or the impact of a particular paper.

The Journal of Biofuels is a peer-reviewed journal. It was launched in 2010. This journal aims to provide a snapshot of the latest research and advances in the field of biofuels. The journal addresses what is new, significant and practicable. Journal of Biofuels is published twice a year (January-June and July-December) by indianjournals.com, New Delhi. The Journal has both print and online versions. The journal publishes original research reports, review papers and communications screened by national and international researchers who are experts in their respective fields.

The original manuscripts that enhance the level of research and contribute new developments to the biofuel sector are encouraged. The work belonging to the fields of biosciences, biotechnology, chemical engineering, biofuel production, quality assurance & standards, automation and other related areas are invited. The journal is expected to help researchers, technologist and policy makers in the key sector of biofuels to enhance their understanding of it. This journal is Indexed/Abstracted with Index Copernicus (2015, ICV -

84.13), NAAS Rating for 2017 - 3.73, Indian Science Abstract, Google Scholar, J-Gate. Agricola, EBSCO Discovery, Summon (Proquest) and Indian Citation Index.

Literature Review

Arya & Mishra, (2011) carried out an analysis of the literature on Bio-fuel, the periodic growth of literature, distribution of authorship, distribution of subject, bibliographical forms of literature, productivity ranking, and geographic origin of literature on the subject. Arya, (2012) studied authorship pattern and collaborative research trends are studied in the field of veterinary medicine based on the data collected from 'Indian Journal of Veterinary Medicine' published during the period 1999 - 2007. Ding., Foo, & Chowdhury, (1998) studied collaborative pattern of the Information Retrieval (IR) research field is analyzed using co-authored articles retrieved from *Social Science Citation Index* for a period of 11 years from 1987 to 1997. Goyal., Gupta & Kumar, (2013) studied Authorship trends and collaborative research are studied in the field of Chemical Sciences based on the data collected from Indian Journal of Chemistry Section-B (IJCB) published during the 2002-2011. Jeysankar & Grace, (2016) analyzed the publishing pattern of ecology literature during 1964 - 2013. The Scopus database is used to retrieve the data in the field of Ecology in India and 1165 records were found during the study period.

Thavamani & Velmurugan, (2013) studied the publication trends of scholarly papers in *Annals of Library and Information Studies* published in New Delhi, India through a bibliometric analysis of 310 contributions in the journal during the year 2002–2012. Thavamani, (2013) identified the growth and authorship pattern of productivity of articles of source journal "DESIDOC Journal of Library & Information Technology". It was observed from the study that the year 2008 was most participating year during the study period 2007 - 2011. Thavamani, (2014) analyzed the Malaysian Journal of Library and Information Science. A total of 279 research articles and 575 authors were examined by growth of contributions by year and volume, authorship patterns by year and volume, authorship patterns, author productivity, single and multi authored papers by year, authorship patterns by global, most prolific contributors and degree of collaboration. Thavamani, (2014) studied the authorship trend in the "Chinese Librarianship: an International Electronic Journal (CLIEJ)" during the period of 1996-2013. A total of 133 articles and 221 authors in the Journal were examined by year and volume to ascertain authorship patterns, author productivity, and degree of collaboration.

Thavamani, (2015) studied of Collaborative Librarianship (CL) during the period of 2009-2014. A total of 223 research contributions and 343 authors were examined by growth of contributions by year and volume, authorship patterns by year and volume, growth of authors by year, authorship patterns, author productivity, authorship patterns by global, most prolific contributors and degree of collaboration. Velmurugan & Radhakrishnan, (2016) conducted with 448 contributions published in the journal selected six years for a period between 2007 and 2012. Vimala & Reddy, (1996) traced authorship pattern and collaborative research in zoology with a sample of 19,323 journal citations figured in the theses on zoology accepted

for the award of the doctoral degree by Sri Venkateswara University, Tirupati, India. Zafrunnisha & Reddy, (2009) studied the authorship pattern and collaborative research in the field of psychology.

Objectives

The objectives of the present study are as follows:

1. To study research article contributions by year and issue
2. To study authorship patterns by year and volume
3. To study authorship patterns
4. To study author productivity
5. To identify most prolific authors
6. To study ranking by author's affiliation
7. To study collaborative authorship patterns among the various countries
8. To study contributions by institution
9. To study contribution by departments
10. To study authorship by country and
11. To identify degree of author collaboration

Methodology

The data was collected from the website (www.indianjournals.com) of the Journal of Biofuels. Fourteen (14) issues from seven (7) volumes from 2010 to 2016 have been selected for the study. Research article contributions by year and issue, authorship patterns by year and volume, authorship patterns, author productivity, most prolific contributors, ranking by authors, authorship patterns among the various countries, author's productivity, most prolific authors, ranking by authors, collaborative authorship patterns among the various countries, contribution by institutions, contribution by departments, authorship patterns by global and degrees of author collaboration were recorded. All articles are source article published in the last seven years (2010 – 2016) were recorded in a separate white sheet and results were entered in Microsoft Excel. Statistical Package for Social Sciences (SPSS) was used for the analysis. These data were organized, calculated, tabulated, analyzed, and presented by using simple arithmetic and statistical methods in order to provide analysis.

Data Analysis

Data on the bibliographic records were collected from the online version of the Journal of Biofuels pertaining to the period 2010 – 2016. A total of 106 contributions and 367 authors were analyzed the journal. The flowing tables and brief analyses represent the substance of this research.

Table 1. Contribution of Research Articles by Year and Issue

Sl. No.	Year/ Issues	No. of Articles	Percentage %
1	2010/2	30	28.301
2	2011/2	15	14.150
3	2012/2	12	11.320
4	2013/2	10	9.433
5	2014/2	12	11.320
6	2015/2	13	12.264
7	2016/2	14	13.207
Total		106	100.000

Graph 1. Contribution of Research Articles by Year

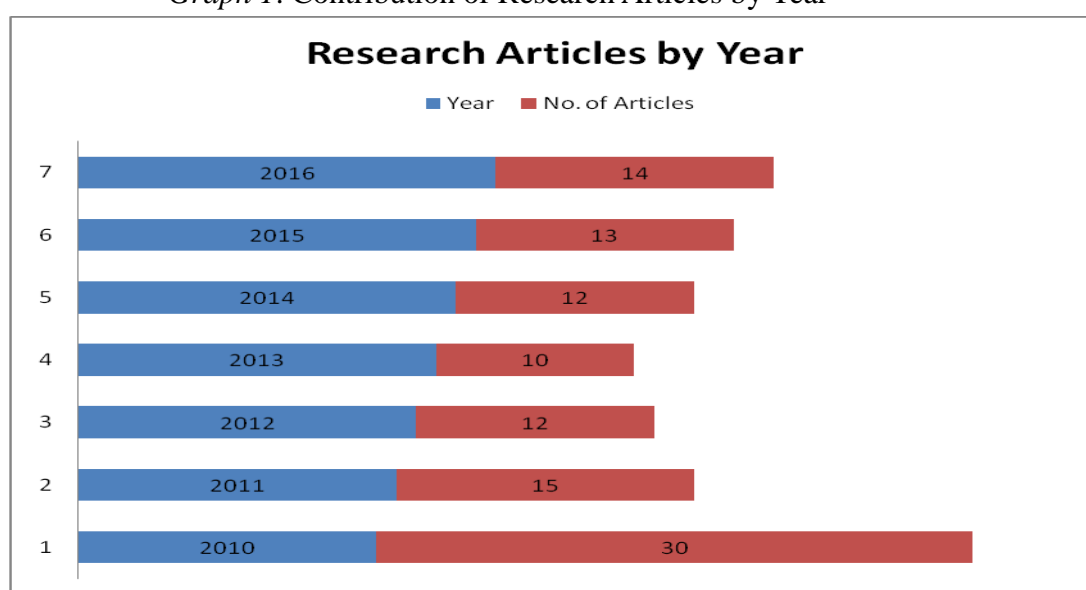


Table 1 and graph 1 show the growth of research articles published in the Journal of Biofuels from 2010 to 2016. Altogether, there are 106 research articles. The highest number of research articles 30(28.301%) was published in 2010, while the lowest number 10(9.433%) of research articles were published in the year of 2013.

Table 2. Authorship Patterns by Year and Volume

Sl. No.	Year	Volume	Authors per Article								Total No. of Papers (%)	Total No. of Authors (%)
			One	Two	Three	Four	Five	Six	Seven	Eight		
1	2010	1	4	5	10	6	3	1	--	1	30(28.301)	97(26.430)
2	2011	2	1	1	5	3	2	2	1	--	15(14.150)	59(16.076)
3	2012	3	1	1	4	2	1	1	1	1	12(11.320)	49(13.351)
4	2013	4	1	--	4	2	3	--	--	--	10(9.433)	36(9.809)
5	2014	5	--	2	4	3	3	--	--	--	12(11.320)	43(11.716)
6	2015	6	--	8	3	1	1	--	--	--	13(12.264)	34(9.264)
7	2016	7	--	3	4	4	3	--	--	--	14(13.207)	49(13.351)
Total			7	20	34	21	16	4	2	2	106(100)	367(100)

Table 2 shows the authorship patterns by year and volume. Out of the 7 contributions by single author, volume 1 has the highest number i.e., 4(57.142%) and 2, 3, 4 have the lowest number i.e. 1(14.285%) contributions. Out of the 34 contributions by three authors, volume 1 has the highest i.e. 10(29.411%). And 6 has the lowest number i.e., 3(8.823%) contributions. Out of 21 contributions by four authors, volume 1 has the highest i.e. 6 (28.571%) and 6 has the lowest number i.e., 1(4.761%) contributions.

Out of 20 research articles contributed by two authors, volume 6 has the highest i.e. 8 (40%) while volume 2 and 3 has the lowest number i.e. 1(5%). Of the 16 research articles contributed by five authors, volumes 1, 4, 5, 7 have the highest number i.e. 3(18.75%) while volume 3 and 6 have the lowest number i.e. 1(6.25%).

Of the 4 research articles contributed by six authors, volume 2 has the highest number i.e. 2(50%) while volume 1 and 2 has the lowest number i.e. 1(25%). Of the 2 research articles contributed by seven authors, volumes 2 and 3 have the 1(50%). And of the 2 research articles contributed by eight authors, volumes 2 and 3 have the 1(50%).

Table 3. Authorship Patterns

Sl. No.	Author	Total	Percentage (%)
1	Single Author	7	6.603
2	Two Authors	20	18.867
3	Three Authors	34	32.075
4	Four Authors	21	19.811
5	Five Authors	16	15.094
6	Six Authors	4	3.773
7	Seven Authors	2	1.886
8	Eight Authors	2	1.886
Total		106	100.000

Graph 2. Authorship Patterns

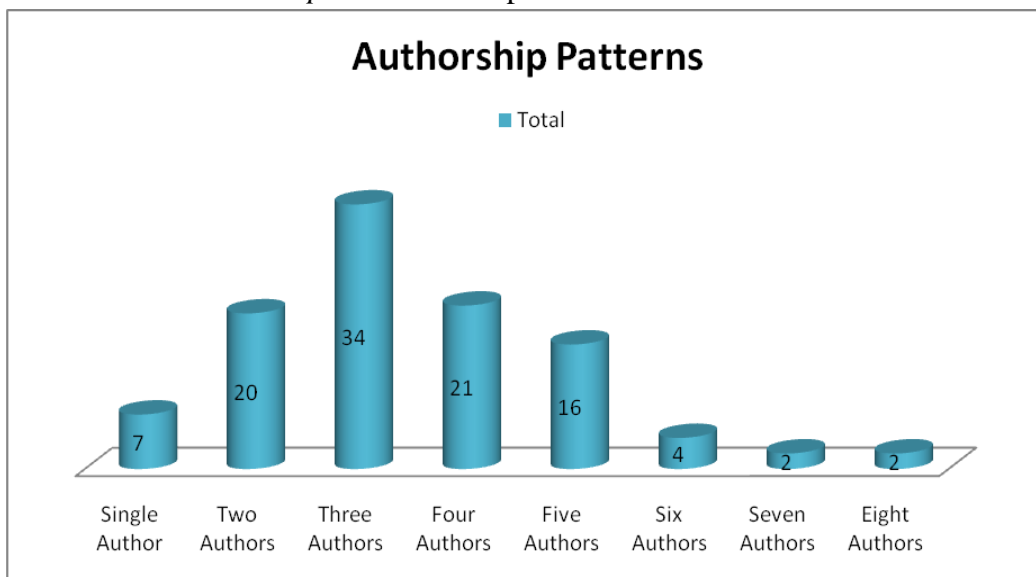


Table 3 and graph 2 shows the majority 99(93.396%) of the papers have been written in joint authorship. It is seen that only 7(6.603%) of the publications were single authored articles. Followed by three authors 34(32.075%), four authors 21(19.811%), two authors 20 (18.867%), five authors 16(15.094%) and six authors 4(3.773%). The lowest number of contributions was made by seven and eight authors 2(1.886%).

Table 4. Author's Productivity

Sl. No.	Year	Total No. of Papers	Total No. of Authors	AAPP*	Productivity per Author
1	2007	30	97	3.233	0.309
2	2008	15	59	3.933	0.254
3	2009	12	49	4.083	0.244
4	2010	10	36	3.6	0.277
5	2011	12	43	3.583	0.279
6	2012	13	34	2.615	0.382
7	2013	14	49	3.5	0.285
Total		106	367	3.462	0.288

Notes: *Average Authors per Paper (AAPP) = Number of authors/Number of papers.
Productivity per author = Number of papers/Number of authors.

Graph 3. Author's Productivity

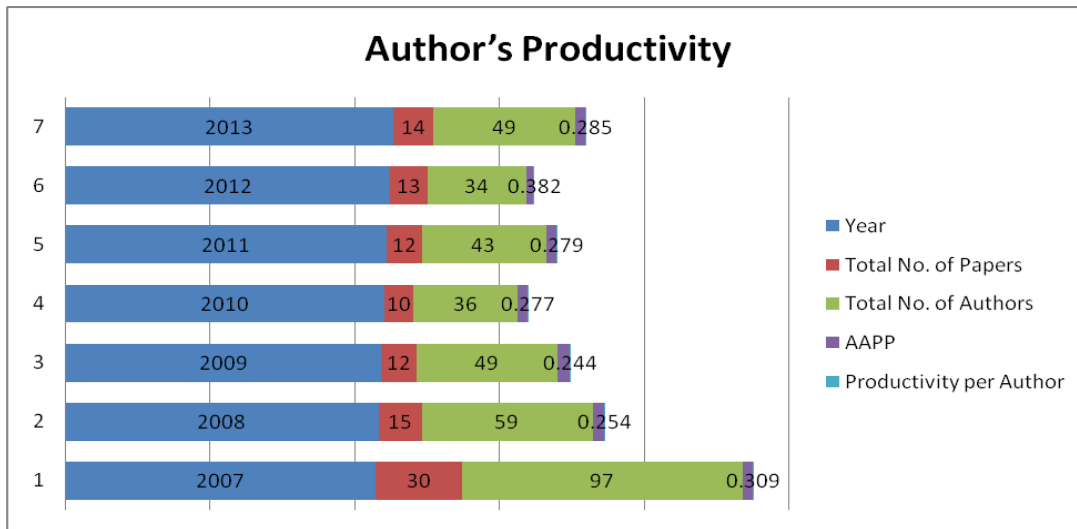


Table 4 and graph 3 shows the data related to author's productivity. The total average number of authors per paper is 3.462 and the average productivity per author is 0.288. The highest number of author's productivity (97, 3.233%) was in 2007. The minimum number of author's productivity (34, 2.615%) was in 2012.

Table 5. Most Prolific Authors

Sl. No.	Name	No. of Contributions	Country	Percentage (%)	Rank
1	Kumar Naveen	11	India	2.997	1
2	Athar Moina	3	India	0.817	2
3	Maji S	3	India	0.817	2
4	Parthiban K.T	3	India	0.817	2
5	Sidharth	3	India	0.817	2
6	Alhassan Yahaya	2	India	0.544	3
7	Balamurugan K	2	India	0.544	3
8	Bhargava Pankaj	2	India	0.544	3
9	Bugaje Idris Muhammad	2	Nigeria	0.544	3
10	Chauhan B. S	2	India	0.544	3
11	de Oliveira Marcelo Firmino	2	Brazil	0.544	3
12	Gautam Raghvendra	2	India	0.544	3
13	Jamal M.S	2	Bangladesh	0.544	3
14	Karnwal Ashish	2	India	0.544	3
15	Khan Abdul Majeed	2	Pakistan	0.544	3
16	Khan Akram Ahmad	2	India	0.544	3
17	Mishra Chinmaya	2	India	0.544	3
18	Pandey A.K	2	India	0.544	3
19	Pugazhvadivu M	2	India	0.544	3
20	Sharma P.B	2	India	0.544	3
21	Singh R. C	2	India	0.544	3
22	Singh S.K	2	India	0.544	3
23	Singh V.K	2	India	0.544	3
24	Subbulakshmi V	2	India	0.544	3
25	Sujan S.M.A	2	Bangladesh	0.544	3
26	Tamilvanan A	2	India	0.544	3
27	Usmani Rahil Akhtar	2	India	0.544	3
28	Single Author Contributions	300		81.743	4
Total		367		100.000	

Table 5 shows that a total of 367 authors have contributed 106 research articles over a period of seven years (2010-2016). The most prolific author Kumar Naveen (India) has contributed 11(2.997%) research articles. Followed by Athar Moina (India), Maji S (India), Parthiban K.T (India) and Sidharth (India) each of them have contributed 3(0.817%) research articles. Besides, there are twenty one authors who have contributed 2(0.544%) research articles each. And the remaining 300(81.743%) research articles have been contributed by single authors.

Table 6. Ranking by Author's Affiliation

Sl. No.	Author's Affiliation	No. of Contributions	Percentage (%)	Rank
1	Professors/Associate Professors/ Assistant Professors	60	16.348	1
2	Research Scholars/ Student (UG & PG)	37	10.081	2
3	Senior Scientist/ Scientist	13	3.542	3
4	Mechanical Engineering	5	1.362	5
5	Head/ Directors	7	1.907	4
6	Principal Scientist/ Research Associates	4	1.089	6
7	Agricultural Officer/ Core Member/ Doctor	3	0.817	7
8	Vice Chancellor	1	0.272	8
9	Affiliation Not mentioned	237	64.577	
Total		367	100.00	

Graph 4. Ranking by Author's Affiliation

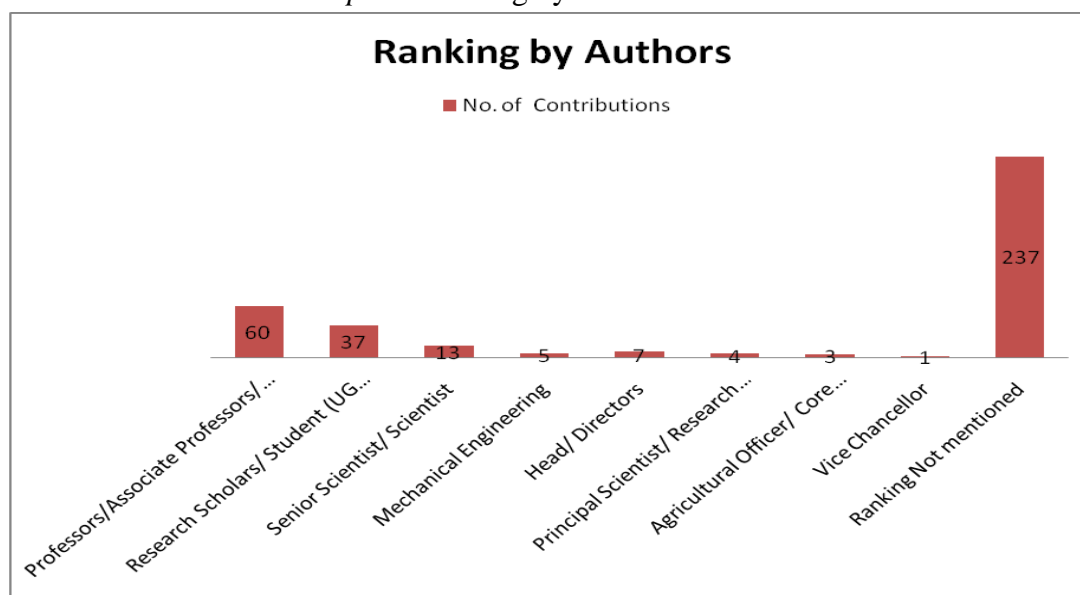


Table 6 and graph 4 shows the greater part 60 (16.348%) of the authored articles have been contributed by Professors/ Associate Professors/ Assistant Professors. The second highest number of articles 37(10.081%) written by research scholars/ student (UG & PG). And 13(3.542%) are senior scientist/ scientist authored papers, followed by 7(1.907%) are contributed by head/ directors. The lowest number of contributions i.e., 1(0.272%) contributed by a Vice Chancellor from Delhi Technological University, New Delhi, India.

Table 7. Authorship Collaborative Patterns among the various countries

Sl. No.	Year, Volume / Issue	Collaborative Author	Collaboration Country
1	2016, Volume-7, Issue-2	Kumar Vikas	India
2		Tripathi Abhishek Mani	Czech Republic
3		Tak Pooja Kumari	India
4		Chouhan Satyameshwari	India
5	2016, Volume-7, Issue-1	Eseyin Anthonia E	Nigeria
6		Steele Philip H	USA
7		Pittman Charles U. Jr	USA
8		Ekpenyong Kieran I	Nigeria
9		Soni Bhawna	USA
10	2014, Volume-5, Issue-1	Alhassan Yahaya	India
11		Gautam Raghvendra	India
12		Kumar Naveen	India
13		Bugaje Idris M	Nigeria
14	2013, Volume-4, Issue-1	Olugbemide Akinola D	Nigeria
15		Ohiro E	Nigeria
16		Abdulkadir Mohammed N	Nigeria
17		Oladipo A	Nigeria
18		Ogungbemide Damilare I	Canada
19	2012, Volume-3, Issue-1	Singla Ankit	Japan
20		Paroda Shashi	India
21		Dhamija Sunder S	India
22		Goyal Sneh	India
23		Shekhawat Kirti	South Africa
24		Amachi Seigo	Japan
25		Inubushi Kazuyuki	Japan
26	2010, Volume-1, Issue-1	Kumar Anil	Kenya
27		Valoyi Redeem	South Africa
28		Ochieng Aoyi	South Africa
29		Onyango Maurice	South Africa
30	2010, Volume-1, Issue-1	Masimalai Senthil Kumar	India
31		Tazerout Mohand	France
32		Ndayishimiye Pascal	France
Total		32	32

Table 7 the shows authorship and collaborative patterns among the various countries. Seven research articles were contributed by 32 collaborated authors from 9 (Canada, Czech Republic, France, India, Japan, Kenya, Nigeria, South Africa and USA) countries. The highest number of collaborative research article authors 10(31.25%) were from the India, followed by Nigeria 7(21.875%), South Africa 4(12.5%), Japan 3(9.375%), USA 3(9.375%),

France 2(6.25%). The lowest number of contributions 1(3.125%) were from Canada, Czech Republic respectively.

Table 8. Contribution by Institutions

Sl. No.	Institutions	No. of Contributions	Percentage (%)
1	Academic	269	73.297
2	Research	74	20.163
3	Others	16	4.359
4	Institutions Not Mentioned	8	2.179
Total		367	100.00

Graph 5. Contributions by Institution

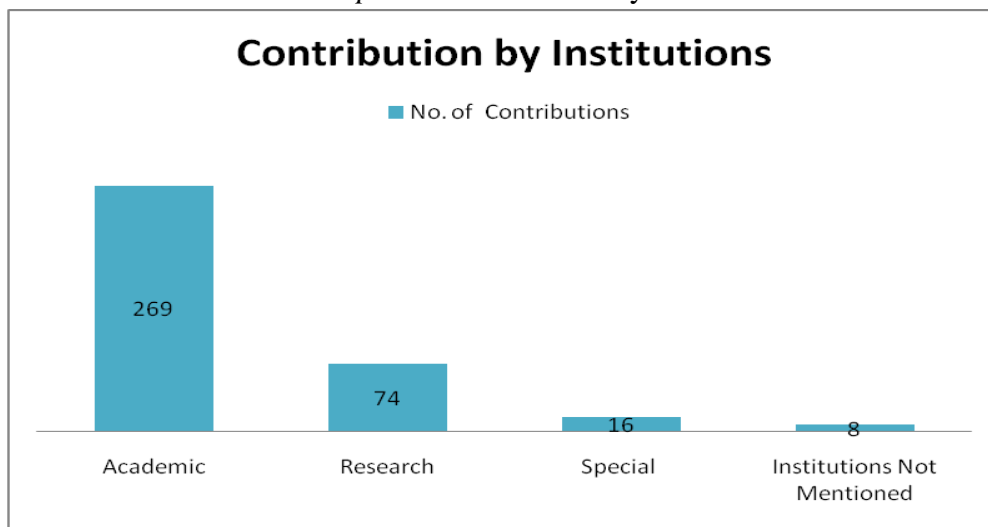


Table 8 and graph 5 shows the type of institutions with which the authors of the articles were affiliated. Out of 367 contributions, the highest number i.e. 269(73.297%) were from authors affiliated with academic institutions; whereas the lowest number i.e. 16(4.359%) has been contributed by other institutions. The second highest number i.e. 74(20.163%) were from research institutions. And 8(2.179%) of the contributions were not mentioned their affiliated institutions.

Table 9. Contributions by Departments

Sl. No.	Departments	No. of Contributions	Percentage (%)
1	Department of Mechanical Engineering	64	17.438
2	Department of Chemistry	25	6.811
3	Department of Chemical Engineering	21	5.722
4	Department of Biotechnology	17	4.632
5	Department of Microbiology	11	2.997
6	Institute of Fuel Research and Development	8	2.179
7	Center for Advanced Studies & Research in Automotive Engineering	7	1.907

8	Department of Biochemistry	7	1.907
9	Five Department Contributions (25)	5	6.811
10	Four Department Contributions (24)	6	6.539
11	Three Department Contributions (33)	11	8.991
12	Two Department Contributions (34)	17	9.264
13	Single Department Contributions	27	7.356
14	Department not mentioned	64	17.438
Total		367	100.00

Table 9 shows the type of departments with which the authors of the articles were affiliated. Out of 367 contributions, the highest number i.e. 64(17.438%) were from Department of Mechanical Engineering. The second highest number i.e. 25(6.811%) were from Department of Chemistry. Followed by Department of Chemical Engineering 21 (5.722%), Department of Biotechnology 17(4.632%), Department of Microbiology 11 (2.997%), Institute of Fuel Research and Development 8(2.179%), Centre for Advanced Studies & Research in Automotive Engineering and Department of Biochemistry 7(1.907%) etc. The lowest number of contributions i.e. 1(0.272%) was from 27 various departments. And 64(17.438%) of the contributions were not mentioned their departments.

Table 10. Authorship by Country

Sl. No.	Country	No. of Contributions	Percentage (%)
1	India	264	71.934
2	Nigeria	38	10.354
3	Brazil	18	4.904
4	Bangladesh	11	2.997
5	USA	8	2.179
6	Pakistan	5	1.362
7	Russia	5	1.362
8	South Africa	4	1.089
9	Japan	3	0.817
10	France	2	0.544
11	Spain	2	0.544
12	Canada	1	0.272
13	Czech Republic	1	0.272
14	Germany	1	0.272
15	Kenya	1	0.272
16	Malta (Republic of Malta)	1	0.272
17	Country Not Mentioned	2	0.544
Total		367	100.00

Graph 6. Authorship by Country

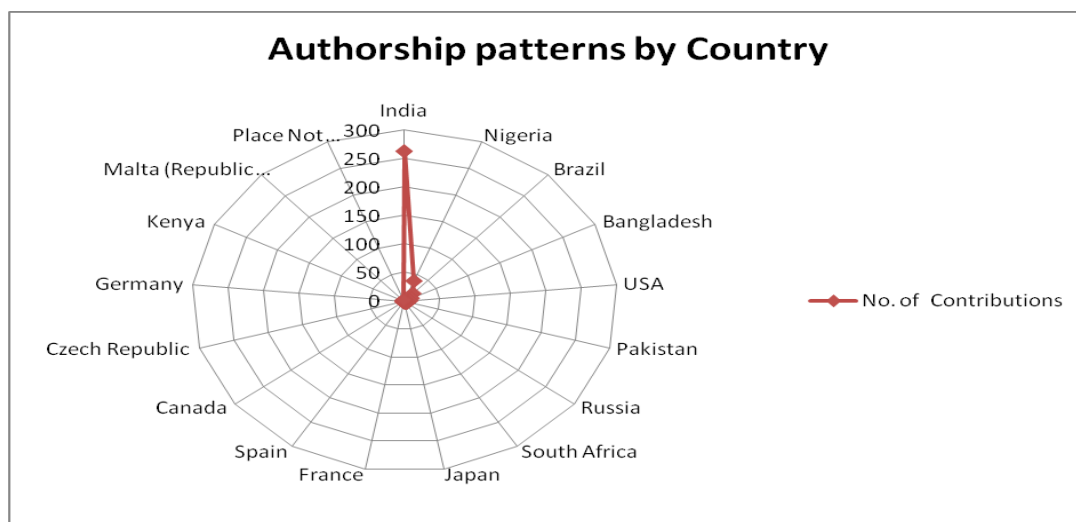


Table 10 and graph 6 shows the distribution of authors by country. The 106 research articles were contributed by 367 authors from 16 countries. The highest number of authors 264(71.934) were from the India, followed by Nigeria 38(10.354%), Brazil 18(4.904%), Bangladesh 11(2.997%), USA 8(2.179%), Pakistan and Russia 5(1.362%) etc. The lowest number of contributions 1(0.210%) were from Canada, Czech Republic, Germany, Kenya and Malta (Republic of Malta) respectively.

Table 11. Degree of Author Collaboration

Sl. No.	Year	Single Authored Paper (Ns)	Multi Authored Papers (Nm)	Total (Nm+N _s)	Degree of Collaboration
1	2007	4	26	30	0.866
2	2008	1	14	15	0.933
3	2009	1	11	12	0.916
4	2010	1	9	10	0.9
5	2011	--	12	12	1
6	2012	--	13	13	1
7	2013	--	14	14	1
Total		7	99	106	0.933

Degree of Collaboration

The extent of Degree of Collaboration in the Journal of Biofuels research has been measured with the help of the formula devised by K. Subramaniam, (1983)

The formula is where

$$C = \frac{Nm}{Nm + Ns}$$

C = Degree of Collaboration in a discipline

Nm = Number of multiple authored papers

Ns = Number of single authored papers”

Accordingly, the Degree of Collaboration has been calculated as follows:

$$C = \frac{99}{7 + 99} = \frac{99}{106} = 0.933$$

As a result, the average degree of author collaboration in the Journal of Biofuels is 0.933, which clearly indicates its dominance upon multi-author authored contributions.

Findings and Conclusion

In this article present an overview of global collaborative research trends in biofuel field. This bibliometrics study examines in the Journal of Biofuels. Eleven topics are considered: contributions by year and issue, authorship patterns by year and volume, authorship patterns, author productivity, most prolific contributors, ranking by author's affiliation, authorship patterns among the various countries, author's productivity, most prolific authors, ranking by authors, collaborative authorship patterns among the various countries, contribution by institutions, contribution by departments, authorship patterns by global and degrees of author collaboration.

- ❖ There are 106 research articles contributed by 376 authors. The highest number of research articles 30(28.301%) was published in 2010, while the lowest number 10(9.433%) of research articles were published in the year of 2013.
- ❖ Out of the 7 contributions by single author, volume 1 has the highest number i.e., 4 (57.142%) and 2, 3, 4 have the lowest number i.e. 1(14.285%) contributions. Out of the 34 contributions by three authors, volume 1 has the highest i.e. 10(29.411%). And 6 has the lowest number i.e., 3(8.823%) contributions. Out of 21 contributions by four authors, volume 1 has the highest i.e. 6(28.571%) and 6 has the lowest number i.e., 1 (4.761%) contributions.
- ❖ Out of 20 research articles contributed by two authors, volume 6 has the highest i.e. 8 (40%) while volume 2 and 3 has the lowest number i.e. 1(5%). Of the 16 research articles contributed by five authors, volumes 1, 4, 5, 7 have the highest number i.e. 3 (18.75%) while volume 3 and 6 have the lowest number i.e. 1(6. 25%).
- ❖ Out of 4 research articles contributed by six authors, volumes 2 has the highest number i.e. 2(50%) while volume 1 and 2 has the lowest number i.e. 1(25%). Of the 2 research articles contributed by seven authors, volumes 2 and 3 have the 1(50%). And

of the 2 research articles contributed by eight authors, volumes 2 and 3 have the 1 (50%).

- ❖ The majority 99 (93.396%) of the papers have been written in joint authorship. It is seen that only 7(6.603%) of the publications are single authored articles. And 34 (32.075%) are three authored papers, followed by 21(19.811%) are contributed by four authors. The lowest number of contributions i.e., 2(1.886%) contributed by seven and eight authors.
- ❖ The total average number of authors per paper is 3.462 and the average productivity per author is 0.288. The highest number of author's productivity (97, 3.233%) was in 2007. The minimum number of author's productivity (34, 2.615%) was in 2012.
- ❖ The most prolific author Kumar Naveen (India) has contributed 11(2.997%) research articles. Followed by Athar Moina (India), Maji S (India), Parthiban K.T (India) and Sidharth (India) each of them have contributed 3(0.817%) research articles. Besides, there are twenty one authors who have contributed 2(0.544%) research articles each. And the remaining 300(81.743%) research articles have been contributed by single authors.
- ❖ The greater part 60(16.348%) of the authored articles have been contributed by Professors/ Associate Professors/ Assistant Professors. The second highest number of articles 37(10.081%) written by research scholars/ student (UG & PG). And 13(3.542%) are senior scientist/ scientist authored papers, followed by 7(1.907%) are contributed by head/ directors. The lowest number of contributions i.e., 1(0.272%) contributed by a Vice Chancellor from Delhi Technological University, New Delhi, India.
- ❖ Seven collaborative research articles were contributed by 32 collaborated authors from 9 (Canada, Czech Republic, France, India, Japan, Kenya, Nigeria, South Africa and USA) countries. The highest number of collaborative research article authors 10(31.25%) were from the India, followed by Nigeria 7(21.875%), South Africa 4(12.5%), Japan 3(9.375%), USA 3(9.375%), France 2(6.25%). The lowest number of contributions 1(3.125%) were from Canada, Czech Republic respectively.
- ❖ Out of 367 contributions, the highest number i.e. 269(73.297%) were from authors affiliated with academic institutions; whereas the lowest number i.e. 16(4.359%) has been contributed by other institutions. The second highest number i.e. 74(20.163%) were from research institutions. And 8(2.179%) of the contributions were not mentioned their affiliated institutions.
- ❖ The 106 research articles were contributed by 367 authors from 16 countries. The highest number of authors 264(71.934) were from the India, followed by Nigeria 38(10.354%), Brazil 18(4.904%), Bangladesh 11(2.997%), USA 8(2.179%), Pakistan

and Russia 5(1.362%) etc. The lowest number of contributions 1(0.210%) were from Canada, Czech Republic, Germany, Kenya and Malta (Republic of Malta) respectively.

- ❖ Out of 367 contributions, the highest number i.e. 64(17.438%) were from Department of Mechanical Engineering. The second highest number i.e. 25(6.811%) were from Department of Chemistry. The lowest number of contributions i.e. 1(0.272%) was from 27 various departments. And 64(17.438%) of the contributions were not mentioned their departments.
- ❖ As a result, the average degree of author collaboration in the Journal of Biofuels is 0.933, which clearly indicates its dominance upon multi-author authored contributions.

The Journal of Biofuels has been growing over 7 years from publishing research articles. The multi-author collaborations are leading role from early onwards. The Journal of Biofuels has been accepting articles from all over the country. As of today, there are 16 countries contributing research articles to the journal. It is getting world-wide popularity and identification by publishing scholarly articles from authors across the world. The journal encourages contribution about professional policies, practices, principles and progress in the Biofuels fields.

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