Profile The Journal Of ‘ The Chemical Record’: A Bibliometric Study

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Abstract- *The present study has been carried out to find the trend of publications in the Journal of The chemical Record (TCR) for the period 2010–2019 using various Bibliometric parameters. A total of 799 were published in Currently 12 issues per year and all articles were taken into consideration for the study .The highest number of contribution in single author paper was observed in 2016 with 30 publications. While multi-authored papers maximum contribution were observed in 2019 with 142. The overall degree of collaboration is 0.77.*

Keywords- Journals , The Chemical Record , Chemistry, Bibliometric

I. INTRODUCTION

Chemistry is the scientific study of the properties and performance of matter. It is a natural science that covers the fundamentals that make up matter to the compounds composed of atoms, molecules and ions, their work of art, structure, properties, behavior and the changes they undergo during a reaction with other substances (Wiki, 2024).TCR provides carefully selected highlight papers by leading researchers that introduce the author's own experimental and theoretical results in a framework designed to establish perspectives with earlier and contemporary work and provide a critical review of the present state of the subject. The articles are intended to present concise evaluations of current trends in chemistry research to help chemists gain useful insights into fields outside their specialization and provide experts with summaries of recent key developments.

THE CHEMICAL RECORD:

The Chemical Record (TCR) is a "highlights" journal publishing timely and critical overviews of new developments at the cutting edge of chemistry of interest to a wide audience of chemists (2013 journal impact factor: 5.577). The scope of published reviews includes all areas related to physical chemistry, analytical chemistry, inorganic chemistry, organic chemistry, polymer chemistry, materials chemistry, bioorganic chemistry, biochemistry, biotechnology and medicinal chemistry as well as interdisciplinary fields. (https://onlinelibrary.wiley.com)

SCOP & LIMITATION:

Scope of present study is web based journals of The Chemical Record with highest impact factor. The content of these journals was collected for the years 2010-2019.

DATA COLLECTION:

Data was collected from all issues of journal on The chemical Record. The data was collected the parameters viz. year wise of publication, Degree of collaboration (DC) & Rate of Single Authorship (RSA), Collaborative co-efficient (CC) of publications, Relative Growth Rate (RGR) and Doubling Time (Dt),Year wise Ratio of Growth for the period from 2010-2019.

DATA ANALYSIS:

The present Study deals with the Bibliometric analysis as per the following parameters.

1. To Find out Year-Wise Publication Productivity and Collaboration Rate of articles
2. To Find out Degree of collaboration & Rate of Single Authorship of articles
3. To Examine the Collaborative co-efficient of publications
4. To Examine the Relative Growth Rate (RGR) and Doubling Time (Dt) of publications.
5. To Find out Year-Wise Ratio of Growth

1.Year-Wise Publication Productivity and Collaboration Rate of articles

The word publication means the act of publishing. Productivity refers to measures of output from production processes, per unit of input. Collaboration is a recursive

process where two or more people or organizations work together toward an intersection of common goals.

1: Year-Wise Publication Productivity and Collaboration Rate of articles

Year	Single Authored Publication	Multi Authored Publication	Total no. of Publication	Collaboration Rate
2010	13	21	34	0.62
2011	8	15	23	0.65
2012	16	19	35	0.54
2013	7	24	31	0.77
2014	27	43	70	0.61
2015	28	46	74	0.62
2016	30	140	170	0.82
2017	13	59	72	0.82
2018	21	107	128	0.84
2019	20	142	162	0.88
Total	**183**	**616**	**799**	0.77

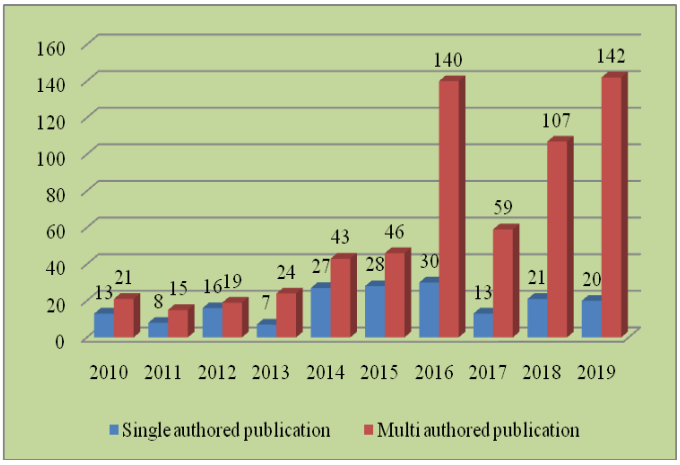

Figure No.1: Year-Wise Publication Productivity and Collaboration Rate of articles

It can be observed from Table No.1 & figure No.1 that during the periods 2010-2019 a total of 799 Articles were published in "The Chemical Record" by researchers in various countries. Majority of the contributions were contributed in year 2019 with 162 contributions, Minimum contributions were contributed in years 2011 with same contributions 23 contributions.

2. Degree of collaboration & Rate of Single Authorship of articles

Degree of collaboration (DC) among different authors presented in Table No.2 in order to calculate the Degree of Collaboration (DC) the formula given by Subramanyam (1983) have been employed which is expressed mathematical as;

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

Where as- DC= Degree of Collaboration
Nm= No. of multi authors papers
Ns= No. of Single author paper

Here Nm= 21

Ns= 13

$$DC = \frac{21}{13+21} = 0.62$$

Table No.2: Degree of Collaboration & Rate of Single Authorship of articles

Year	Single Authored Publication	Multi Authored Publication	Total no. of Publication	DC	Rate of Single Authorship
2010	13	21	34	0.62	38.24
2011	8	15	23	0.65	34.78
2012	16	19	35	0.54	45.71
2013	7	24	31	0.77	22.58
2014	27	43	70	0.61	38.57
2015	28	46	74	0.62	37.84
2016	30	140	170	0.82	17.65
2017	13	59	72	0.82	18.06
2018	21	107	128	0.84	16.41
2019	20	142	162	0.88	12.35
Total	**183**	**616**	**799**		
Overall Degree of Collaboration					**0.77**
Overall Rate of Single Authorship					**22.90**

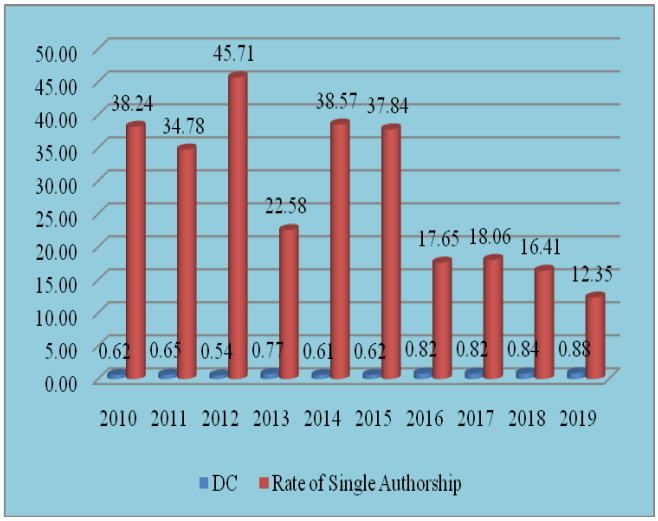

Figure No.2 Degree of Collaboration & Rate of Single Authorship

Table No.2 and Figure No.2 shows that in the 10 years period, the multi authorship publications are higher and predominant than single authored. The multi authored articles are highest in the year 2019 with degree of collaboration (DC) was 0.88, It is seen that the multi authorship trend in increasing, and the Single Author articles and highest in the year 2012 with Rate of Single authorship was 45.71. It is seen that the Single Authorship trend in increasing. The overall degree of collaboration for the study period is 0.77. The overall rate of single authorship is just 22.90.

3. The Collaborative co-efficient of publications

According to Ajiferuke et al. (1988) who have shown the mean number of authors per paper, the proportion of multiple authorship as a measure of degree of collaboration in a discipline, is inadequate. Therefore, they have proposed a measure combining some of the merits of both measures into what is known as Collaborative Coefficient.

Suppose, if a paper has a single author, the author receives one credit; if two, each receives ½ credits. In general, if we have 'n' authors each receive 1/n credits. Hence, the average credit awarded to each author of a random paper is E [1/n], a value which lies between 0 and 1. If '0' is to correspond to single authorship, then the CC is defined as:

CC = 1-E [1/n]

= 1- (1/j) p (N=j)

And its sum ∑ rate = 1-f1+(1/2)f2+(1/2)f3+…(1/k)fk N

Table No.3 The Collaborative co-efficient of publications

Collaborative co-efficient in Journal of The Chemical Record						
Year	**1**	**2**	**3**	**> 4 Authors**	**Total**	**CC**
2010	13	12	4	5	34	0.37
2011	8	10	2	3	23	0.37
2012	16	10	5	4	35	0.32
2013	7	14	7	3	31	0.45
2014	27	21	15	7	70	0.37
2015	28	23	13	10	74	0.37
2016	30	52	49	39	170	0.52
2017	13	27	15	17	72	0.50
2018	21	30	33	44	128	0.55
2019	20	47	28	67	162	0.57
Total	**183**	**246**	**171**	**199**	**799**	**0.48**

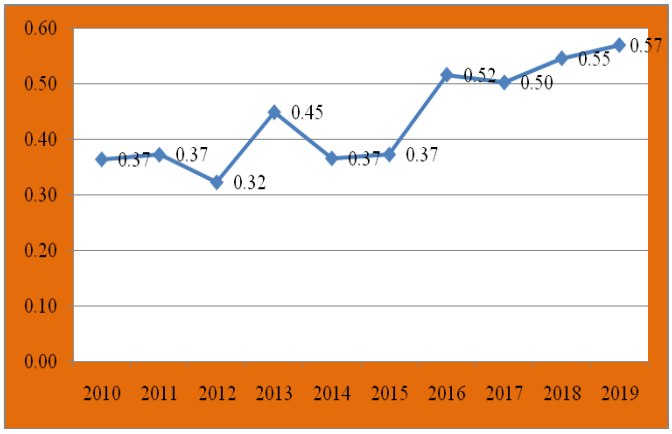

Figure No.3 The Collaborative co-efficient of publications

Table No 3 and Figure No. 3 shows that the CC has increased from 0.37 in 2010 to 0.57 in 2019 indicating that research among analyst is fairly collaborative with an average CC of 0.48.

4. The Relative Growth Rate (RGR) and Doubling Time (Dt) of publications

The Growth of literature of Knowledge Organization is being measured with the Scientometic indicators Relative Growth Rate (RGR) and Doubling Time (Dt). The RGR is obtained from the folling formula used by Karpagam R, et.al, (2011);

$$R(P) = \frac{log2p - log1p}{2T - 1T}$$

Hence R(P)=Relative Growth Rate of Articles over the specific period of Time.

$Log_e 1p$=Log of initial number of articles,

Log_e 2p= log of final number of articles

2T-1T= the unit difference between the initial time and final times.

The Dt.is obtained with the following formula;

$$Dt(P) = \frac{0.693}{R(P)}$$

Table No.4 The Relative Growth Rate (RGR) and Doubling Time (Dt) of publications

Relative Growth Rate (RGR) and Doubling Time (DT) of publications								
Year	**No. of Pub**	**Cumulative Frequency**	**W1**	**W2**	**RGR**	**Mean[R(A)]**	**DT(A)**	**Mean DT(A)**
2010	34	34	--	3.52	--	0.34	--	1.62
2011	23	57	3.52	4.04	0.52		2.77	
2012	35	92	4.04	4.52	0.48		1.44	
2013	31	123	4.52	4.81	0.29		2.38	
2014	70	193	4.81	5.26	0.45		1.54	
2015	74	267	5.26	5.58	0.32	0.28	2.16	2.81
2016	170	437	5.58	6.07	0.49		1.41	
2017	72	509	6.07	6.23	0.16		4.33	
2018	128	637	6.23	6.45	0.22		3.15	
2019	162	799	6.45	6.68	0.23		3.01	

Table No.4 It noticed that the mean relative growth for the first five years 2010 to 2014 is (0.34), and the mean relative growth rate for the last five years 2015 to 2019 reduced to (0.28). While the Doubling time for different years [Dt(p)]gradually increased from (2.77) in 2011 to (3.01) in 2019.The mean doubling time for the first five years (i.e. 2010 to 2014) is only (1.62) which is increased to (2.81) during the last five years (2015 to 2019). Thus as the rate of growth of publications was decreased, the corresponding Doubling Time was increased.

5. Year-Wise Ratio of Growth

Table No. 5 Year-Wise Ratio of Growth

Year	No. of Publications	ROG	ROG with base year 2014
2010	34		0.49
2011	23	0.68	0.33
2012	35	1.52	0.50
2013	31	0.89	0.44
2014	70	2.26	1.00
2015	74	1.06	1.06
2016	170	2.30	2.43
2017	72	0.42	1.03
2018	128	1.78	1.83
2019	162	1.27	2.31

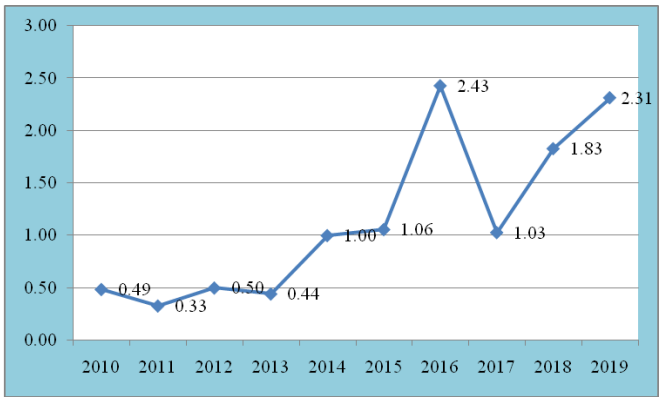

Figure No.5 Year-wise Ratio of Growth

Table No.5 & Figure No.5 Discloses that during 2014 the ratio of growth is less than 1 indicating that the quantum of articles published in the concerned year is less than that of the previous years. During 2016 the ratio of growth is more than 2.43 conveying that the number of articles published during those years is more than that of previous years.

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