Research Publication on the Medicinal Use of Pepper from 2008-2017: A Bibliometric Analysis

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Abstract - **Pepper has been used for its flavour and as a medicine. For the Indian cooking, pepper plays an important role. Pepper cures constipation, diarrhoea, earache, gangrene, heart disease, hernia, hoarseness, indigestion, insect bites, insomnia, joint pain, liver problems, lung disease, oral abscesses, sunburn, tooth decay, and toothaches. Black pepper is the world's most traded spice. Black pepper is originally used as a medicine in south India. It is farming mainly in the tropical region. Pub Med is a primary bibliographic database that covers 18 million references to journal articles in life sciences, which gives great importance to biomedicine. The period of coverage is from 1947 to the present. For this database, citations from about 5,400 worldwide journals in 39 languages and 60 languages for older journals were covered. The period is from the year 2008 to 2017 "Pepper" data were downloaded. Various analyses were done to find out the Individual Authors Contribution, Geographical distribution, and year wise research, Ranking of Journals, RGR and Doubling Time of Research. Bib excel tool is used for data analysis.**
Keywords: **Pub Med, Pepper, RGR, Doubling Time and Tooth Decay**

I. INTRODUCTION

Pepper is widely used in traditional Indian medicine and as a home remedy for relief from sore throat, throat congestion, and cough. Pepper is a native of South and South East Asia. It is referred as "Black Gold" and used as a form of Commodity Money. Pepper was grown particularly in Southern Thailand, Malaysia and Kerala. The study is confined to a period of ten years from 2008 to 2017 covered in the database PubMed only. The key word "Black pepper" or "Piper nigrum" or pepper is used to download the results. The results 3913 were saved in the text file format. The data were analysised with the toolbox named as Bibexcelwhich was developed by OllePersson. This software is very useful for analysing bibliographic data.

II. NEED FOR THE STUDY

Pepperis a Dravidian word Peppercorns are often classified on their place of origin. Two types come from India's Malabar Coast and Tellicherry. "Journal of Chemical Information and Computer Sciences (JCICS) was found out the apex journal in this subsection for the last 30 years. In the subject of chemical information and computer sciences (CICS) bibliometric approach was used to survey the state-of-the-art of research." C.Baskaran examined the research growth, relative growth rate and doubling time of publications, institution wise and ranking of authors in research productivity of Graph Theory during 2004-2011. Plants modulate defence signalling networks in response to different biotic stresses. The study evaluated the effect of a phloem-sucking aphid on plant defence mechanisms in pepper during subsequent pathogen attacks on leaves and rhizosphere bacteria on roots. The findings of this study show that aphid feeding elicits plant resistance responses and attracts beneficial bacterial populations to help the plant cope with subsequent pathogen attacks.

III. OBJECTIVES OF THE STUDY

The major objectives of this study are:
1. To find out the Quantum of research done
2. To find out the Distribution of Research Productivity according to Country
3. To find out the research by Language
4. To find out the Publication Types and Authorship Pattern
5. To apply of Zipf Law in the Pepper Research Publications

IV. QUANTUM OF LITERATURE PUBLISHED ON PEPPER DURING 2008-2017

TABLE I QUANTUM OF LITERATURE

S. No.	Year	Number of Respondents	Percentage
1	2008	305	7.79
2	2009	314	8.02
3	2010	341	8.71
4	2011	344	8.79
5	2012	346	8.84
6	2013	411	10.50
7	2014	420	10.73
8	2015	430	10.98
9	2016	466	11.90
10	2017	536	13.69
	Total	3913	100.00

The literature has been classified in Table I according to year of publication. It is found that there is a gradual growth

of literature in the subject of study by year after year. There is a gradual growth for research in Pepper.

Distribution of contributions of Pepper by country and year wise is presented in Table II. It is seen from the table that United States has produced 1392 records ranking in the first position, England 764 in the second position and Netherland 410 third positions respectively. Indian contributions 145 have been ranked in the 9th position.

TABLE II DISTRIBUTION OF RESEARCH PRODUCTIVITY ACCORDING TO COUNTRY

S. No.	Country	No. of Records
1	United states	1392
2	England	764
3	Netherland	410
4	Germany	338
5	Korea (south)	183
6	Japan	166
7	Switzerland	155
8	China	146
9	India	145
10	Austria	145
11	Brazil	48
12	Ireland	34
13	France	23
14	Belgium	21
15	Poland	20
16	Canada	19
17	Pakistan	17
18	Demark	17
19	Thailand	16
20	Russia (Federation)	16
21	Others	124
	Total	3913

The below table shows the dissemination of Pepper literature by language The scholarly communication is effected through English language in almost all the countries irrespective of the native language of the country. Rojas Sola and Aguilera Garcia have studied "various bibliometric indicators for different countries and research centers such as the number of documents (article and review), showing per document, productivity, the average number of citations, authors, research centres, national and international collaboration including their networks, the weighted and relative impact factor, as well as the h-index. Furthermore, we have analyzed the international dissemination of research of countries through journals and the relationship with the impact factor to detect the published journals of each country. We have also shown that English is the most common language of publication." This phenomenon is not an exception to the subject of Pepper which published about 94.96% of the research

output in English. This is followed by Chinese (1.45%) and Spanish (0.61%) as second and third positions respectively. Therefore from the above analysis, it is inferred that English language is dominating in the scholarly communication of Pepper research

TABLE III DISTRIBUTION OF RESEARCH PRODUCTION BY LANGUAGE

S. No.	Language	No. of Records	Percentage
1	English	3716	94.96
2	Chinese	57	1.45
3	Spanish	24	0.61
4	Russian	20	0.51
5	French	17	0.43
6	Japanese	17	0.43
7	Portuguese	15	0.38
8	Polish	13	0.33
9	German	12	0.30
10	Czech	10	0.25
11	Dutch	7	0.17
12	Italian	5	0.12
	Total	3913	100.00

Table IV reveals the distribution of the 'Pepper' research output according to publication type. It is conventional that utmost of the scholarly statement of scientific study is available in Journals and occasionally presented in the conferences. Of course, those conference papers are additional updated and issued in journals of the particular field of knowledge. Therefore, scientific statement is being regularly made through subject journals. In the Pepper study, about 76.10% have printed in journals, 8.97% have published in Comparative Study and 4.67% are published in English Abstract.

TABLE IV PUBLICATION TYPES WISE DISTRIBUTION OF PEPPER RESEARCH

S. No.	Publication Type	No. of Records	Percentage
1	Journal Article	2981	76.10
2	Comparative Study	351	8.97
3	English Abstract	183	4.67
4	Evaluation Studies	108	2.76
5	Case Reports	108	2.76
6	Historical Article	50	1.27
7	Clinical Trial	38	0.97
8	Retraction of Publication	26	0.66
9	Comment	26	0.66
10	Biography	14	0.35
11	Letter	14	0.35
12	Editorial	7	0.17
13	Book	7	0.17
	Total	3913	100.00

The study of authorship pattern or productivity is one of the important aspects in the bibliometric analysis. Generally it is necessary to concentrate on authorship pattern to assess the research contributions in a field and Pepper research is not an exception. In order to identify author productivity and authorship pattern the researcher has attempted to analyses this below Table V. Seventy two authors jointly produce one article. It is evident that 26.52% of product by single author and 17.76% of the contributions were by Joint authors. About 15.84% represent by three authors.

TABLE V AUTHORSHIP PATTERN IN PEPPER RESEARCH

S. No.	Author	No. of Records	Percentage
1	Single	1038	26.82
2	Joint	695	17.76
3	Three	620	15.84
4	Four	658	16.81
5	Five	325	8.30
6	Six	208	5.31
7	Seven	145	3.80
8	Eight	84	2.14
9	More than eight	136	3.47
	Total	3913	100.0

Now a day's scientific research is going tremendous manner. Lot of man power and finance also involved. Relative Growth Rate (RGR) over the particular period of interval can be considered from the following equation whereas

1-2 R = mean relative growth rate over the specific period of interval
loge W1 = log of initial number of articles/pages
loge W2 = log of final number of articles/pages after a specific period of interval

T2 - T1 = the unit difference between the initial time and the final time aa-1 = average no. of articles
The year can be take here as the unit of time. The Relative Growth Rate for the articles and pages can be calculate separate.

Therefore
1 - 2 1) can represent the mean RGR per unit of articles per unit of year over a specific−1 year−R (aa period of interval.
2009 = Loge 619 − Loge 305/2008-2009
 = 7.79 − 8.02/1 = 0.74
2010 = Loge 960 − Loge 619/2010-2009
= 8.71 - 8.02/1 = 0.43

The researcher tried to implement the Relative Growth Rate (RGR) and Doubling Time for Pepper. It is seen from the below Table VI shows that Relative Growth Rate. From 2008 (0.74) to 2017 (0.15) the rate is decreasing.

TABLE VI RELATIVE GROWTH RATE (RGR)

Year	Quantum of Output	Cumulative Total of Output	W_1	W_2	$1-2 \bar{R}^{(aa-1}_{year-1)}$ RGR	Dt(a)
2008	305	305		7.79		
2009	314	619	7.79	8.02	0.74	0.93
2010	341	960	8.02	8.71	0.43	1.60
2011	344	1084	8.71	8.79	0.32	2.19
2012	346	1650	8.79	8.84	0.24	2.85
2013	411	2061	8.84	10.50	0.22	3.09
2014	420	2481	10.50	10.73	0.19	3.71
2015	430	2911	10.73	10.98	0.17	3.98
2016	466	3377	10.98	11.90	0.20	3.53
2017	536	3913	11.90	13.69	0.15	4.50

V. FINDINGS AND CONCLUSION

In the field LIS research is developing through bibliometric analysis during the few years. It is interesting to note the bibliometric analysis of science. Pepper is widely used in traditional Indian Medicine and as home remedy for sore throat, throat congestion and cough. The polyphenol extracts of alligator pepper, ginger and nutmeg displayed good antioxidant as well as antiglycation potential. They are very safe for consumption. From the PubMed Database the 3913 pepper research was done for the year 2008 to 2017. United States is the top most country with the maximum number of publication of 1392. India is in the 9 the place with 145 examines. It is find out that out of 3913 Pepper publications 3716 (96.94%) articles are published in English language. Journal article contribution is 2981 (76.10%). In the Pepper Research Four authors contributions are high 85 (16%). Single Authors contributions are (26.52).In the present age of the volume of scientific publication is increasingly and the prices of the periodicals are spiralling high,a information officer faces problems to subscribe and acquire them due to paucity of funds. At this function compilation of ranked list of publication with the help of publication on the pharmacy and medicinal use of pepper study can be useful to guide to documentation officer for acquiring stand documents for quality publication within the limited funds. This study also measures the effectiveness of information services and resources available to pepper researchers.

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