

RESEARCH PUBLICATIONS: A SCIENTOMETRIC STUDY ON CAB DIRECT FOR THE COCONUT (COCOSNUCIFERA) DURING 1976-2019

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ABSTRACT

This research is in the field of coconut during the period 1976-2019, about information obtained from the CAB Direct Online database through Scientometric analysis. The analysis found that 1886 papers were published over the period from 1976 to 2019, and 174 papers published in 2012 to 2014 were the largest number of publications. International Food Research Journal is the most active and published ranking journal with 49 articles (2.59%) is the most important of 10 journals publishing their research papers¹. India could become the world's leading country with 372 papers (19.72%), including (Tamil Nadu, Karnataka, Maharashtra, Gujarat, Odessa, West Bengal, Uttar Pradesh, Andaman and Nicobar Islands, Assam, Pondicherry, Madhya Pradesh, Manipur, Meghalaya, Goa, Lakshadweep, Punjab, Rajasthan) contributing Indian publications followed by Brazil (6.04%) and Srilanka (3.55%).

KEYWORDS: *Scientometric, Coconut, Cocos Nucifera, CAB Direct Online, Countries, Relative Growth Rate, Doubling Time*

INTRODUCTION

The coconut tree (*Cocos nucifera*) belongs to the family of palm trees (Arecaceae), and is the only living member in the genus *Cocos*. The word coconut may refer to the whole coconut palm, seed, or fruit which is a drupe, not a nut, botanically¹. The name derives from the Old Portuguese and Spanish word *coco*, which means head or skull after the three indentations on the coconut shell that represent facial features. Throughout coastal tropical areas, they are common, and are a cultural symbol of tropics. It is one of the world's most important plants and is also called the tree of life. Among many other uses it supplies fruit, coal, cosmetics, folk medicine and building materials². Throughout the tropics and subtropics, the inner flesh of the mature seed, as well as the coconut milk derived from it, form a daily part of the diets of many people. Coconuts are different from other fruits as their endosperm contains a significant volume of clear liquid, known as coconut water or juice from coconut. Mature coconuts can be used as edible seeds, or processed from the flesh for oil and plant milk, hard shell charcoal and fibrous husk coir. Dried coconut flesh is called copra, and its derived oil and milk is widely used in cooking, especially frying as well as in soaps and cosmetics. The hard shells, fibrous husks and long pinnate leaves can be used as material for making a variety of furnishing and decoration items. In particular in India, where it is used in Hindu rituals, the coconut has cultural and religious importance in many societies. The dropping condition of their mature fruit has caused coconut to concern them with death. It forms the basis of wedding and worship ceremonies in Hinduism, a Vietnamese coconut religion and features in many societies' origin myths. For thousands of years, coconuts have been used by humans and may have expanded to their present range due to settlers on the Pacific

Islands. The coconut's evolutionary history is in doubt with hypotheses suggesting it may have originated in Asia, South America or on Pacific Islands. Though less than 30 are more common, trees grow up to 30 m (98ft) tall and can yield up to 75 fruits per year. Plants are intolerant of cold weather and enjoy sufficient rainfall, as well as maximum sunshine. The crop is plagued by many insect pests and diseases, and is a threat to commercial production. Around 74 % of the world's coconut supply comes from Thailand and the Philippines

OBJECTIVES OF THE STUDY

The main objective of this study is to research the results of the analysis in coconut (*Cocos nucifera*) research, as reflected in the CAB Direct Online database during 1976–2019, its publications output. The study focuses on the following priorities:

- To examine the overall range of publications output on coconut analysis supported CAB Direct Online database for the period 1976–2019
- To study the top 10 journals publishing more research papers on analysis of coconut
- To identify the top 10 authors in coconut analysis field
- To identify the highest rank-wise countries in the analysis of coconut
- Identify the language distribution of an analysis of coconut

METHODOLOGY

The CAB Direct Online database for the 44 years (1976–2019) was used to retrieve the data³ by searching inside the title field on the keyword 'Coconut'. The entire collection of documents that the CAB Direct Online database holds is 1886.

RESULTS AND ANALYSIS

The data collected on coconut from the CAB Direct Online database was analyzed and different types of statistical methods were used, such as tables used to display the results.

Growth Rate and Doubling Time in Coconut research Output

A study of the growth rate of coconut research output is an important factor in field research analysis, and table-1 of production indicates the relative growth rate in coconut production or in the test production. Quotations from the Relative Growth Rate and Doubling Time are extracted and described in table-1. It can be found that the relative publishing growth rate decreased and increased, but not a constant from the rate of 0.69 in 1976-1977 and 0.76 in 1998 i.e. the growth frequency was varied. The cumulative relative growth for the 44-year period (1976-2019) showed a growth rate 0.23, although the corresponding doubling time for the specific year rose gradually from 0.76 for 1998. The mean doubling time for the 44 years (1976-2019) was only 3.77, which increased in the subsequent doubling period.

Table 1: Relative Growth Rate [R(C)] and Doubling Time [Dt(C)] of Overall Research Output

S. No.	Year	No. of Publications [x]	Cumulative No. of Output [y]	$\text{Log}_e 1^{y-x}$	$\text{Log}_e 2^y$	[R(c)]	Mean [R(c)]	[Dt(C)]	Mean [Dt(C)]
1.	1976	2	2	0	0.69	0.69	0.23	1.00	3.77
2.	1977	2	4	0.69	1.38	0.69		1.00	
3.	1978	2	6	1.38	1.79	0.41		1.69	
4.	1979	1	7	1.79	1.94	0.15		4.62	
5.	1980	1	8	1.94	2.07	0.13		5.33	
6.	1982	1	9	2.07	2.19	0.12		5.77	
7.	1983	4	13	2.19	2.56	0.37		1.87	
8.	1987	2	15	2.56	2.70	0.14		4.95	
9.	1988	4	19	2.70	2.94	0.24		2.89	
10.	1989	1	20	2.94	2.99	0.05		1.38	
11.	1993	2	22	2.99	3.09	0.1		6.93	
12.	1995	1	23	3.09	3.13	0.04		1.73	
13.	1998	26	49	3.13	3.89	0.76		9.15	
14.	1999	1	50	3.89	3.91	0.02		3.46	
15.	2002	50	100	3.91	4.60	0.69		1.00	
16.	2003	2	102	4.60	4.62	0.02		3.46	
17.	2004	17	119	4.62	4.77	0.15		4.62	
18.	2005	38	157	4.77	5.05	0.28		2.47	
19.	2006	34	191	5.05	5.25	0.2		3.46	
20.	2007	47	238	5.25	5.47	0.22		3.15	
21.	2008	85	323	5.47	5.77	0.3		2.31	
22.	2009	85	408	5.77	6.01	0.24		2.89	
23.	2010	128	536	6.01	6.28	0.27		2.57	
24.	2011	132	668	6.28	6.50	0.22		3.15	
25.	2012	174	842	6.50	6.73	0.23		3.01	
26.	2013	174	1016	6.73	6.92	0.19		3.65	
27.	2014	174	1190	6.92	7.08	0.16		4.33	
28.	2015	168	1358	7.08	7.21	0.13		5.33	
29.	2016	138	1496	7.21	7.31	0.1		6.93	
30.	2017	148	1644	7.31	7.40	0.09		7.70	
31.	2018	156	1800	7.40	7.49	0.09		7.70	
32.	2019	86	1886	7.49	7.54	0.05		1.38	
Total		1886							

Most Popular Journals

International Food Research Journal with 49 papers (2.59%) followed by Madras Agricultural Journal with 42 papers (2.22%) were the most common of the scientists concerned with coconut research⁴. The study revealed that 32 papers (1.69%) and Mysore Journal of Agricultural Sciences 29 papers (1.53%) were published out of the high five most prominent coconut researcher’s journals, three journals viz., Philippine Journal of Crop Science 34 papers (1.80%) and Ciencia Animal. Table-2 lists the top 10 most popular journals, with the amount of papers reported.

Table 2: Popular Journals

S. No.	Journal Name	No. of Papers	Percentage
1.	International Food Research Journal	49	2.59
2.	Madras Agricultural Journal	42	2.22
3.	Philippine Journal of Crop Science	34	1.80
4.	Ciencia Animal	32	1.69
5.	Mysore Journal of Agricultural Sciences	29	1.53
6.	Journal of Southern Agriculture	27	1.43
7.	South West China Journal of Agricultural Sciences	27	1.43
8.	Acta Agricultural Jiangxi	26	1.37
9.	Cocos	26	1.37
10.	International Journal of Agricultural Technology	25	1.32

Prolific / Ranking Authors

The study reveals that Engelmann, F is the most prolific / Ranking authors of coconut analysis, who reported 51 papers (2.70%) followed by 31 papers (1.64%) from Chulaki, B.M. It is observed that out of the top five authors who contributed⁴ a lot of papers in coconut analysis, the world ranking author contributed a paper level of 17 to 51 viz., Jayarama, Sreedharan, K, and Vinod Kumar, P.K31 papers (1.64%). Table – 3 lists the top10 prolific/ranking authors in the coconut analysis field.

Table 3: Top 10 Prolific / Ranking Authors

S. No.	Name of Author	No. of Papers	Percentage
1.	Engelmann F	51	2.70
2.	Chulaki B.M	31	1.64
3.	Jayarama	31	1.64
4.	Sreedharan K	31	1.64
5.	Vinod Kumar P.K	31	1.64
6.	Batugal P.A	28	1.48
7.	Numes J.F	23	1.21
8.	Batugal P	19	1.00
9.	Cao Hongxing	17	0.90
10.	Cao H.X	17	0.90

Rank-Wise Countries Distribution of Publications

The study reveals that India is the top country in coconut research with 372 papers contributing⁵ almost (19.72%) of the global coconut research such as (Tamil Nadu, Karnataka, Maharashtra, Gujarat, Odessa, West Bengal, Uttar Pradesh, Andaman and Nicobar Islands, Assam, Pondicherry, Madhya Pradesh, Manipur, Meghalaya, Goa, Lakshadweep, Punjab, Rajasthan) contributing Indian publications output followed by Brazil with 114 papers (6.04%). Sri Lanka ranks third with 67 papers (3.55%), Philippines ranks fourth with 62 (3.28%) and South Africa ranks with 49 papers (2.59%) out of India's 10 nations¹¹. The top 10 countries are furnished in table-4, based on a variety of publications.

Table 4: Rank-wise Countries

S. No.	Location	No of Articles (%)	Cumulative Publications	Cumulative Percentage of Articles (%)
1.	India	372 (19.72)	372	19.72
2.	Brazil	114 (6.04)	486	25.76
3.	Srilanka	67 (3.55)	553	29.31
4.	Philippines	62 (3.28)	615	32.59
5.	South Africa	49 (2.59)	664	35.18
6.	Indonesia	45 (2.38)	709	37.56
7.	Malaysia	31 (1.64)	740	39.2
8.	China	27 (1.43)	767	40.63
9.	Thailand	27 (1.43)	794	42.06
10.	Ceara	21 (1.11)	815	43.17

Predominant Languages

It is observed that English, with 1389 papers (73.64%) followed by Portuguese with 236 (12.51) and Chinese with 100 (5.30%) is the most prevalent language⁶ used by the researchers in Coconut research. Table-5 furnishes the top 10 predominant languages.

Table 5: Types of Language

S. No	Language	No. of Papers	Percentage
1.	English	1389	73.64
2.	Portuguese	236	12.51
3.	Chinese	100	5.30
4.	Spanish	77	4.08
5.	Thai	35	1.85
6.	Indonesian	19	1.00
7.	Korean	18	0.95
8.	Persian	12	0.63
9.	French	4	0.21
10.	Italian	3	0.15

CONCLUSIONS

Scientometric analysis of coconut research based on the CAB Direct Online database shows that India is the leading producer of scientific research production with 372 publications, around (19.72 %) of total coconut research output from the 10 countries⁷. The other interesting thing is the Engelmann, F with 51 papers (2.70%), followed by Chulaki B.M. are the most prolific/ ranked authors in the field with 31 articles (1.64%). It is observed that a paper level of 17 to 51 viz., Jayarama, Sreedharan, K and Vinod Kumar, P.K paper (1.64%), has contributed from the top five authors who contributed a lot of

papers in coconut research. The study recorded that 49 papers (2.59%) from the International Food Research Journal on coconut research followed⁸ by 42 papers (2.22%) from Madras Agricultural Journal were among the top five most preferred journals. The study recorded that three articles, 34 papers (1.80%) from the Philippine Journal of Crop Science and Ciencia Animal were among the top five most successful coconut researchers' journals.

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