Review Paper

Global Research Contribution on Sugarcane (1951-2015): A Scientometric Study

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Abstract

This paper displays to analyse quantitatively the development and progress of Sugarcane study in India in phrases of e-newsletter output as mirrored in CAB Direct on-line Database. During the interval 1951-2015 a whole of 23,910 papers was published by way of the scientists of India respectively on Sugarcane evaluation. India is the top nation in Agricultural research with its contribution of 3,558 papers which is nearly (14.88%) of the global study output of Agricultural study followed with the aid of the specified nation are in Australia with 1895 papers (7.92%). Essentially the most standard journals with the aid of the scientists concerned with the Sugar Cane evaluation had been: Indian Sugar with 924 papers (3.86%) followed by way of the international Sugar Journal with 739 papers (3.09%). The be trained revealed that out of high five most preferred journals by the Sugar researchers, three journals viz., Cooperative Sugar 627 papers (2.62%) and proceedings of the Annual Congress South African Sugar Technologists organization 463 papers (1.93%) and Sugar Tech 339 papers (1.41%) are released from India is a fourth position and fifth function, is a Sugar Cane global 321 papers (1.34%) of rating which certainly indicates that the contribution of India in Sugar cane evaluation is important role.

Keywords: Sugarcane, Scientometric, CAB Direct, Global Agricultural Crop, Relative Growth Rate, Doubling time.

Introduction

Agriculture is among the most massive sectors of the Indian economic system. It is the one method of living for just about two thirds of the workers in India. Sugarcane is an oldest crop known to man, a foremost crop of tropical and sub-tropical areas worldwide. Sugar cane is a glycophyte, sucrose storing member of tall developing perennial monocotyledonous grass. Across the world, 70% sugar is made from sugarcane. India is the second biggest nation in sugarcane construction on the planet. Sugarcane, an old power supply for human beings and, additional not too long in the past, a replacement of fossil fuel for motor, autos, was once first grown in South East Asia and Western India. Round 327 B.C., it used to be a predominant crop in the Indian sub-continent. It used to be introduced to Egypt around 647 A.D. and, about one century later, to Spain (755 A.D.).

Objective of the Study: The fundamental goal of this learn is to study, the evaluation output of Sugarcane analysis, as mirrored in its publication[1] output for the duration of 1951-2015 in CAB Direct online database. In exacting, the be taught focuses on the subsequent pursuits: i. To examine the relative growth rate and doubling time of overall research output of Sugar Cane analysis supported CAB Direct Online database for the period 1951-2015. ii. To examine the share of Indian contribution and identify the top ranking country within the field of Sugarcane analysis. iii. To study the highest 10 journals publishing more research papers on Sugarcane analysis. iv. To identify the types of publications. v. To identify the highest 9 authors within the field of Sugarcane analysis. vi. To identify the language distribution of Sugarcane analysis. vii. To study the literature output based on subject-category using CABICODE.

Methodology

The Study is based on the publication data in the field of Sugarcane analysis, retrieved from the CAB Direct Online database for 64 years (1951-2015). The process used in the key word, selection was as follows 'Sugar Cane' in the article title and published between 1951-2015.

Results and Discussion

Growth of Publications: The Sugarcane data collected through the CAB Direct Online database has been analyzed and presented. For the presentation of data, different kinds of statistical tools such as tables and diagrams are used.

Year of Publication on Sugar Cane Literature: The study showed that during the period 1951-2015, a complete of 23910 publications were revealed by the Sugarcane analysis. A study of the growth rate of Sugarcane analysis output is an important factor in analyzing the research and development in the field[2]. Table-1 shows that the relative growth rate or research output in the diseases of the Sugarcane. It is clear that the relative growth

rate has 1951-1962 (5) increasing cumulative output trends for 2011-2015 (3129). The mean relative growth rate for the period 1951 and 1986 is worked out to 0.02 and 3.75 for the period 1987 (6.68%) and 2015 (13.0). Perpetually the doubling time for publication of research output in Sugarcane has increased from 4.98 years in 1951-1962 to 34.66 in 1983-1986. The mean doubling time for the period from 1951 to 1962 (4.98) years and for the period 1987 to 2015 it is calculated as 42.90 years (Rajendran.L and Rathinasabapathy.G, 2015). It is evident from the above discussion that the relative growth rate of publication has shown in the Table–1.

Relative Growth Rate:

$$RGR = (1n\overline{W_2} - 1n\overline{W_1}) / (t_2 - t_1)$$

For a steady development expense, the doubling time calculation process is as following:

$$T_d = \log_2 / \log(1+r)$$

Where: T_d =double time, r = a constant growth rate

Rank-Wise Indian States Distribution of Publications: The gain knowledge of displays that India is the highest country in Agricultural research with its contribution of 3,558 papers which is practically (14.88%) of the global study output of Agricultural study adopted via the distinctive country are in Australia with 1,895 papers (7.92%), Brazil ranks third role with 1,857 papers (7.76%) and America is a fourth function with 1,520 papers (6.35%). It covers India is a top level in the field of Agricultural research, Uttar Pradesh, Northern states are ranked first place and it covers 70% of agricultural lands in India so that mainly concentrate on agriculture orientation[3]. The top 8 Country based on number of publications is furnished in Table-2.

Table–1
Relative Growth Rate and Doubling Time of Overall Research Output

Sl.No.	Year	No. of Output	Cumulative No. of Output	W1	W2	R(a)	Mean R(a)	Doubling Time Dt(a)	Mean D(a)
1.	1951-1962	5 (0.02%)	5	0	1.40	1.40		4.98	
2.	1963-1966	12 (0.05%)	17	1.40	1.97	0.57		1.21	
3.	1967-1970	129 (0.53%)	146	1.97	2.39	0.42		1.65	
4.	1971-1974	1783 (7.45%)	1929	2.39	2.49	0.10		6.93	
5.	1975-1978	2387 (9.98%)	4316	2.49	2.53	0.04	0.36	17.33	17.78
6.	1979-1982	1818 (7.60%)	6134	2.53	2.54	0.01		69.31	
7.	1983-1986	897 (3.75%)	7031	2.54	2.57	0.03		23.10	
8.	1987-1990	1599 (6.68%)	8630	2.57	2.59	0.02		34.66	
9.	1991-1994	1894 (7.92%)	10524	2.59	2.61	0.02		34.66	
10.	1995-1998	2246 (9.39%)	12770	2.61	2.63	0.02		34.66	
11.	1999-2002	2782 (11.63%)	15552	2.63	2.64	0.01		69.31	
12.	2003-2006	2358 (9.86%)	17910	2.64	2.67	0.03		23.10	
13.	2007-2010	2871 (12.0%)	20781	2.67	2.68	0.01	0.01	69.31	42.90
14.	2011-2015	3129 (13.0%)	23910	2.68	2.70	0.02		34.66	
		23910							

Table–2
Ranking Country in India of Sugarcane Analysis

Name of the States	No. of Publications	Percentage	Rank
India	3558	14.88	1
Australia	1895	7.92	2
Brazil	1857	7.76	3
USA	1520	6.35	4
South Africa	1029	4.30	5
Queensland	916	3.83	6
Cuba	673	2.81	7
Mauritius	498	2.08	8

Preferred Journals: Essentially the most widespread journals by means of the scientists worried with the Sugarcane evaluation were: Indian Sugar with 924 papers (3.86%) adopted by using the worldwide Sugar Journal with 739 papers (3.09%). The study revealed that out of excessive five most widespread journals by the Sugar researchers, three journals viz., Cooperative Sugar 627 papers (2.62%) and complaints of the Annual Congress South African Sugar Technologists organization 463 papers (1.93%) and Sugar Tech 339 papers (1.41%) are published from India is a fourth situation and fifth position, is a Sugar Cane worldwide 321 papers (1.34%) of ranking which obviously suggests that the contribution of India in Sugarcane analysis is most important function. The easiest 10 most general journals are listed in Table-3 with the amount of papers printed.

Table–3
Preferred Journals by Sugarcane Analysis

Journal Name	No. of Papers	Percentage
Indian Sugar	924	3.86
International Sugar Journal	739	3.09
Cooperative Sugar	627	2.62
Proceedings of the Annual Congress South African Sugar Technologists Association	463	1.93
Sugar Tech	339	1.41
Sugar Cane International	321	1.34
Journal-American Society of Sugarcane Technologists	304	1.27
Sugarcane	292	1.22
Sugar Journal	240	1.00
XXVI Congress, International Society of Sugarcane Technologists	238	0.99

Leading Format of Publication: The learn exhibits that the fundamental supply of publications coated by means of CAB Direct online database for Sugarcane evaluation is journal articles with 17,323 papers (72.45%) followed with the aid of conference papers with 3,089 papers (12.91%). Miscellaneous third position with 941 (3.93%), Annual Report and Book Chapter are within the fourth and fifth places with 403 (1.68%) and 1,914 (8%) various.

The highest 10 varieties of publications are furnished in Table-4.

Table–4
Leading format of Publication

Sl.No.	Kinds of Document	No. of Papers	Percentage
1.	Journal article	17323	72.45
2.	Conference paper	3089	12.91
3.	Miscellaneous	941	3.93
4.	Annual report	403	1.68
5.	Book chapter	1914	8.0
6.	Bulletin	80	0.33
7.	Abstract only	232	0.97
8.	Thesis	24	0.1
9.	Patent	11	0.04
10.	Standard	1	0

Most Productive Authors: The study reveals that Hogarth, D.M is that the most ranking authors of Sugarcane analysis who revealed 980 papers (4.09%) followed by Egan, B.T with 244 papers (1.02%).

It's observed that out of the highest five authors who contributed a lot of papers in Sugarcane analysis, there are world ranking author contributed a paper level of 900 to 1000 viz., Bruce R.C , 480 papers (2.00%), Preston, T.R , 147 papers (0.61%) , and Miller, J.D., 144 Papers (0.60%). Table – 5 lists the highest 9 ranking authors within the field of Sugarcane analysis[4].

Language Distribution: It is located that English is the most predominant language utilized by the researchers for communiqué within the Sugarcane analysis with 19,048 papers (79.66%) adopted through Spanish with 1,877 (7.85) and Portuguese with 1,653 (6.91%). The highest 10 predominant languages are furnished in Table-6.

Table–5
Most Productive Authors in Sugar Cane Analysis

Sl.No.	Name of Author	No. Of Papers	Percentage
1.	Hogarth, D.M.	980	4.09
2.	Egan, B.T.	244	1.02
3.	Bruce, R.C.	480	2.00
4.	Preston, T.R.	147	0.61
5.	Miller, J.D	144	0.60
6.	Kumar, V	117	0.48
7.	Glaz, B	113	0.47
8.	Solomn,S	109	0.45
9.	Thangavelu, S	103	0.43

Table–6
Language Distribution of Sugarcane Analysis

Sl.No.	Language	No. of Papers	Percentage
1.	English	19048	79.66
2.	Spanish	1877	7.85
3.	Portuguese	1653	6.91
4.	Chinese	414	1.73
5.	French	404	1.68
6.	Japanese	158	0.66
7.	Indonesian	144	0.60
8.	German	135	0.56
9.	Russian	124	0.51
10.	Italian	68	0.28

Subject-Wise Category Based on Cabi Code Analysis:
CABICODES are utilized to records to factor the huge subject areas at intervals that they suppose, and comprise five characters: two equal alphabetic characters and three digits. CABICODES alter searchers to search out common field lessons that aren't simple to retrieve mistreatment descriptors alone, and keep cash and time by means of serving for them to exclude inappropriate understanding from their searches[5]. The lists of top 10 CABICODES lined by this be trained are

rectangular measure furnished with in table – 7 that certainly suggests the chosen areas of evaluation by means of the scientists.

Table–7
Subject-wise Category based on CABICODE

Cabi Code	Subject Category	No. of Papers
QQ020	Sugar and Sugar Products	6771
FF100	Plant Production	5838
FF050	Field Crops	5802
FF020	Plant Breeding and Genetics	3834
FF600	Pests, Pathogens and Biogenic Diseases of Plants	2736
JJ700	Fertilizers and other Amendments	2055
QQ500	Food Composition and Quality	2041
NN600	Processing Equipment and Technology	1972
QQ050	Crop Produce	1810
HH000	Pathogen, Pest, Parasite and Weed Management	1620

Findings: These are the findings of the Scientometric study and it is hoped this finding is likely to be helpful for the stakeholders of Sugarcane analysis knowledge managers in these areas: i. Indian contribution to global Agricultural research based on CAB Direct Online database revealed that India has published 23,910 papers in various fields of Sugar cane analysis. ii. Hogarth, D.M is that the most ranking authors of Sugarcane analysis who revealed 980 papers (4.09%) followed by Egan, B.T with 244 papers (1.02%). iii. Most popular journals by the scientists concerned with the Sugarcane analysis were: Indian Sugar with 924 papers (3.86%) followed by the International Sugar Journal with 739 papers (3.09%). iv. Journal articles with 17,323 papers (72.45%) followed by way of conference papers with 3089 papers (12.91%). Miscellaneous 0.33 positions with 941 (3.93%), Annual file and e-book Chapter are in the fourth and fifth locations with 403 (1.68%) and 1,914 (8%) a number of ranking which clearly shows that the contribution of India in Sugarcane evaluation is fundamental position. v. India is the top nation in Agricultural study with its contribution of 3,558 papers which is almost (14.88%) of the global study output of Agricultural study adopted via the special country are in Australia with 1,895 papers (7.92%), Brazil ranks 1/3rd function with 1,857 papers (7.76%) and united states of America is a fourth position with 1,520 papers (6.35%).

Conclusion

World broad sugarcane occupies a field of 20.42 million ha with a whole creation of 1333 million metric tons (FAO, 2003). Out of ten sugar cane producing countries, India is a first place of agriculture production[6]. Agriculture contributes about seventeen percent national GDP. It's expected that growth of four percent per annum is needed to maintain the GDP rate of nine percent. The current study revealed that the total number of records was 23,910[8]. Probably the most popular journals by the scientists concerned with the Sugarcane analysis were: Indian Sugar with 924 papers (3.86%) followed by the International Sugar Journal with 739 papers (3.09%). The analysis reveals that the key source of publications[9] is journal articles with 17,323 papers (72.45%) followed by conference papers with 3089 papers (12.91%). But probably the most ranking authors of Sugarcane analysis who revealed 980 papers (4.09%) followed by Egan, B.T with 244 papers (1.02%). Out of the ninety sugar cane producing countries[7], an Indian researcher needs to be carrying out the Sugar cane field so the contribution of India in this research area could possibly be significantly increased.

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