

Citation Analysis of Journal of Oilseed Research

Surendra Kumar

S Kumar

Abstract

The paper analyses 8093 citations given in the Journal of Oilseed Research (JOR) published during 1993 to 2004 (V.10-21). Out of 8093 citations 5642 are given in main articles and 2551 in short communications of the JOR. It also analyses types of documents cited and identifies core journals. The paper also covers the analyses of authorship patterns of citations along with calculation of collaboration coefficient. Geographical distribution of cited references has also been analyzed. The paper concludes that only 20 core periodicals can cover more than 50% references and also indicates that collaborative research is new trend in oil seeds research.

Keywords: Authorship Pattern, Bradford's law of Scattering, Citation Analysis, Collaboration-Coefficient, Geographical Distribution

1. Introduction

Citation analysis is mathematical analysis of references or citations appended at the end of each scientific communication as an essential part of it. The author(s) of a paper customarily presents a bibliography or references as authentic source of information having research value or to substantiate the point of view of ideas expressed in the cited papers. Analysis of cited papers is used as a measure of impact of individual articles, periodicals, authors, etc. and has become an accepted practice in almost all scientific communications and a well established part of information research. A quantitative approach to the description of documents gaining ground both in research and in practice. Bibliometrics can be used for identifying the core periodicals and the characteristic features of a discipline such as authorship pattern and scattering of literature in different bibliographical forms, etc.

Citation analysis as a tool is used to identify the core references in a subject by counting the citations appended at the end of each scientific article. It is basically a technique, which involves the process of collection, counting, analysis and interpretation of citations given in research writing and thereby helping in identification of significant sources of information. White is of the opinion that, citation analysis plays a promontory role for easy identification of earlier research. It is one of the thrust units of research in the field of library and information science¹.

Sengupta has defined bibliometrics as organisation, classification and quantitative evaluation of publication pattern of macro and micro -communication along with their authorship by mathematical and statistical calculations. Such studies can help in selection of documents saving millions of rupees of the organizations. It helps in planning and organisation of resource sharing, networking and consortia. The institutions may eliminate rarely cited titles from their subscription lists and also weed out unused material to save costly stocking space and reduce maintenance cost²

Many studies on citations analysis exists. Mete and Deshmukh have done a citation analysis Annals of Library Science and Documentation³. Mubeen has carried out citation analysis of doctoral dissertation in chemistry⁴, Bandhyopadhyay of doctoral dissertation in mathematics⁵, Dutta, Das and Sen have done comparative study of citation patterns among eight scholarly journals published by National Institute of Science Communication and Information Resources⁶. Shoken and. Kaushik studied citation analysis Indian Journal of Plant Physiology⁷. Deshpande has worked on citation analysis of dissertation in library and information science⁸. Das and Sen have studied citation pattern of Journal of Biosciences⁹. Dutta and Sen has studied citation pattern of Indian Journal of Chemistry¹⁰.

2. Journals on Oilseed

William Carey, established the first agricultural society in India named Agricultural and Horticultural Society of India at Calcutta in 1820¹¹. A regular journal on oilseeds in India appeared in 1948, called Oils and Oilseeds Journal by Bombay Oilseeds and Oil Exchange Limited. In mid 1950s several commodity committees were established under the auspices of Indian Council of Agricultural Research. One of the commodity committee was Indian Central Oilseeds Committee, which started publishing Indian Oilseeds Journal from 1955¹² but ceased its publication in 1965. The Indian Society of Oilseeds Research (ISOR) was established in 1983, which brought out "Journal of Oil Seed Research" since 1984 as two issues per volume per year. The Journal of Oilseed Research is abstracted in Agrindex, Biological Abstract, Field Crops Abstract; Tropical Oil seeds Abstracts, Soybean Abstract etc.

3. Methodology

The 8093 references given in 24 issues of JOR Vol. 10 - 21 (1993 - 2004) have been analysed in this paper. The analysis includes 5642 references given in main articles and 2451 in short communications.

4. Objectives

The objects of the study are to study the:

1. Year wise distribution of citations;
2. Number of citations per article;
3. Types of documents cited and frequency of citations;
4. Ranked list of periodicals (in order of rank) of citations;
5. Authorship pattern and collaboration coefficient of citations;
6. Journals with number of citations; and
7. Geographical distribution of cited journals

5. Analysis of citation in JOR

The analysis of papers published during this period has been made for main articles and short communications under various heads.

5.1 Year wise Distribution of Citations

In the 12 volumes studied 1060 papers have been published citing 8093 references. Out of these citations, 5642 (69.71%) are given in main articles (MA) and 2451 (30.29 %) are given in short communications (SC). On an average 470 references have been given per volume of two issues for main articles. The average citation per issue is 235 references Similarly 204 references have been published per volume in short communications i.e. 102 per issue. On an average 674.42 references are cited per volume i.e. 337 references per issue. (Table 1)

Table 1: Volume wise and year wise Distribution of Citations

Sr. no.	Year & Vol.	Citation MA	SC	Total	Cumulative Average	%	Cumulative %
1	1993/10	444	167	611	611	7.55	7.55
2.	1994/11	362	136	498	1109	6.16	13.70
3.	1995/12	310	150	460	1569	5.69	19.39
4.	1996/13	333	178	511	2080	6.31	25.70
5.	1997/14	542	131	673	2753	8.33	34.02
6.	1998/15	560	146	706	3459	8.72	42.74
7.	1999/16	473	259	732	4191	9.04	51.79
8.	2000/17	522	200	722	4913	8.92	60.71
9.	2001/18	479	168	647	5560	7.99	68.70
10.	2002/19	489	228	717	6277	8.86	77.56
11.	2003/20	608	329	937	7214	11.58	89.14
12.	2004/21	520	359	879	8093	10.86	100
13.	Total	5642 (69.71%)	2451 (30.29%)	8093	100	—	—
14.	Average Per volume	470.17	204.25	674.42	674.42	—	—

5.2 Number of Citations Per Article

It was found that 445 papers have 1-5 references and 410 (38.28%) papers have 6-10 references. It was found that only 12 papers have not cited any reference (Table 2).

Table 2: Number of Citations : (V 10-21)

Sr. no.	Year & Vol.	Paper	Citations							Total citations
			0	1-5	6-10	11-15	16-20	21-30	31-	
1.	1993/10	MA	--	9	15	12	2	2	1	41
		SC	2	19	12	2	--	--	--	35
2.	1994/11	MA	--	11	22	8	2	--	--	43
		SC	1	16	7	1	1	--	--	26
3.	1995/12	MA	1	12	17	10	--	--	--	40
		SC	--	28	8	--	--	--	--	36
4.	1996/13	MA	1	13	12	7	2	2	--	37
		SC	2	22	13	1	--	--	--	38
5.	1997/14	MA	--	10	26	8	2	3	1	50
		SC	--	26	5	--	--	--	--	31
6.	1998/15	MA	1	14	32	8	1	1	2	59
		SC	--	18	11	--	--	--	--	29
7.	1999/16	MA	--	14	25	8	1	1	1	50
		SC	--	28	12	5	--	--	--	45
8.	2000/17	MA	1	15	24	12	4	2	1	59
		SC	1	13	14	2	2	--	--	32
9.	2001/18	MA	--	19	23	9	4	1	-	56
		SC	--	26	9	1	--	--	--	36
10.	2002/19	MA	--	12	21	7	7	1	1	49
		SC	1	31	10	4	--	--	--	46
11.	2003/20	MA	--	8	23	7	4	1	4	47
		SC	1	27	22	3	--	--	--	53
12.	2004/21	MA	--	19	22	12	2	2	1	58
		SC	--	35	25	4	--	--	--	64
	Main Article		4	156	262	108	31	16	12	589
	Short Communication		8	289	148	23	3	--	--	471
	Grand Total		12	445	410	131	34	16	12	1060
	%	MA+SC	1.13	41.98	38.68	12.35	3.20	1.51	1.13	100

Journals are most cited form of documents with 70.48% citations being from journals followed by 14.28% citations from books and monographs. Theses with 3.87 % references (Ph. D & M.Sc.) and conference / seminars proceedings with only 3.75% references rank next. Citations from other documents such as annual reports, newsletters, advances, etc., are marginal (Table 3).

Table 3: Types of documents cited.

SJ. No.	Documents	No. of Citations Main Article	%	No. of Citations Short Commn.	%	Total	Total %	Rank
1	Periodicals/ Journals	3970	70.37	1734	70.75	5704	70.48	I
2	Books / Monographs	819	14.52	337	13.75	1156	14.28	II
3	Symposiums / Conf./ Seminars /Workshops / Proceeding	335	5.93	130	5.3	465	3.75	IV
4	Thesis; Ph. D	100	1.77	41	1.67	141	1.74	III
	M. Sc.	103	1.83	69	2.82	172	2.13	
5	Annual Progress Reports	61	1.08	19	0.77	80	0.99	VII
6	Annual Reports	65	1.15	38	1.55	103	1.27	VI
7	Bulletins/Newsletters	138	2.44	58	2.37	196	2.42	V
8	Annual Reviews / Advances	32	0.52	20	0.82	52	0.64	VIII
9	Others	19	0.34	5	0.20	24	0.30	IX
	Total	5642 (69.76%)	100	2451 (30.24%)	100	8093	100	-

5.4 Journals cited in JOR

It was found that 5704 citations from journals were from 1122 journals. A rank list of the journal shows that twenty journals account for 50% of the total citations with the top ten journals accounting for 40.41% of the citations. It was further found that 73 journals out of the 1122 journals account for nearly 70% the total references and the remaining 1049 journals (93%) account for the remaining 30% of the citations (Table 4).

5.5 Bradford Distribution of Cited Articles

According to Bradford law, in a descending series of journals relevant to a given topic, three zones can be marked of such that each zone produces 1/3 of total relevant papers and the number of periodicals in each zone should be in 1:@ a 2. In this study there are 8268 references cited, 1/3 of which is 2756 in each zone. First 2756 citations are cited only 3 form journals only. Next 45 journals cover second zone (Total 5512 citations) & third zone consist from 838 journals. On applying Bradford law we find values as 3:45:838. According to Bradford law value in IIIrd Zone should be $15^2 = 225$ Journals. But the actual value is much higher to this value to Bradford law does not held good in this study.

Table 4: Ranked list of periodicals cited: (In order of rank) (Total of Main articles & Short communication citations)

Sr. No.	Name of Journal	Citations Main Articles	Citations Short Com.	Total Citations	Cumulative Citations	Percentage	Cumulative %
1.	Indian Journal of Agronomy	333	161	494	494	8.66	8.66
2.	Journal of Oilseed Research	310	172	482	976	8.49	17.11
3.	Indian Journal of I AgriculturaScience	230	91	321	1297	5.63	22.74
4.	Crop Science	197	48	245	1542	4.30	27.03
5.	Madras Agricultural Journal	111	57	168	1710	2.95	29.98
6	Agronomy Journal	97	52	149	1859	2.61	32.59
7	Jr. of Maharastra Agricultural University	79	43	122	1981	2.14	34.73
8	Indian Journal of Society of Soil Science	75	36	111	2092	1.95	36.68
9	Indian Journal of Genetics	80	30	110	2202	1.93	38.60
10	Indian Journal of Entomology	72	28	100	2302	1.75	40.36
11.	Indian Farming	52	20	72	2374	1.26	41.62
12.	Indian Journal of Genetics & Plant Breeding	54	8	62	2436	1.09	42.70
13.	Indian Phytopathology	36	26	62	2498	1.09	43.79
14.	Phytopathology	40	18	58	2556	1.02	44.81
15.	Plant and Soil	35	22	57	2613	1.00	45.63
16.	Heredity	36	18	54	2667	0.95	46.76
17.	Fertilizer News	39	14	53	27.20	0.92	47.69
18.	Theoretical Applied Genetics	49	1	50	2770	0.88	48.56
19.	Current Science	23	23	46	2816	0.81	49.37
20.	Peanut Science	36	9	45	2861	0.79	50.37

21.	Mysore Journal of Agricultural Research	31	11	42	29.3	0.73	50.89
22.	Journal of American Oil Chemistry	40	1	41	2944	0.72	51.61
23.	Crop Research	33	8	41	2985	0.72	52.33
24.	Seed Research	20	21	41	3026	0.72	53.05
25.	Plant Physiology	26	10	36	3062	0.64	53.68
26.	Seed Science & Technology	28	8	36	3098	0.64	54.31
27.	Andhra Agricultural Journal	20	15	35	3133	0.61	54.93
28.	Crop Improvement	28	6	34	3167	0.60	55.52
29.	Indian Jr. of Plant Physiology	25	6	31	3198	0.55	56.06
30.	Annals of Agricultural Research	23	8	31	3229	0.54	56.61
31.	Indian Journal of Mycology and Plant Pathology	15	15	30	3259	0.53	57.13
32.	Experimental Agriculture	26	4	30	3289	0.53	57.66
33.	Canadian Journal of Plant Sc.	29	1	30	3319	0.53	58.19
34.	Helia	22	7	29	3348	0.51	58.70
35.	Field Crop Abstract	15	11	26	3374	0.46	59.15
36.	Journal of Research (PAU)	12	14	26	3400	0.46	59.60
37.	Indian Journal of Plant Protection	20	3	23	3423	0.40	60.01
38.	Australian Journal of Biological Sc.	15	8	23	3446	0.40	60.41
39.	Indian Agriculturist	13	9	22	3468	0.39	60.80
40.	Pesticides	18	4	22	3490	0.39	61.18
41.	Indian Jr. of Agricultural Research	20	2	22	3512	0.39	61.57
42.	Australian Journal of Agricultural	19	3	22	3534	0.39	61.96

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43.	Indian Journal of Weed Science	18	1	19	3553	0.33	62.29
44.	Journal of Agricultural Science	16	3	19	3572	0.33	62.62
45.	Plant Disease	19	-	19	3591	0.33	62.95
46.	Agricultural Situation in India	15	4	19	3610	0.33	63.29
47.	JNKVV Research Journal	16	2	18	3628	0.32	63.60
48.	Annals of Arid zone	13	5	18	3646	0.32	63.92
49.	Euphytica	15	3	18	3664	0.32	64.24
50.	Annals of Botany	16	1	17	3681	0.30	64.53
51.	Indian Jr. of Economy Entomology	17	-	17	3698	0.30	64.83
52.	Plant Breeding	16	1	17	3715	0.30	65.13
53.	Journal of Science of Food and Agriculture	14	2	16	3731	0.28	64.41
54.	SABRAO Jr.	13	2	15	3746	0.26	65.67
55.	Physiologia Planetarium	12	2	14	3760	0.25	65.92
56.	Australian Journal of Plant Physiology	12	1	13	3773	0.23	66.15
57.	Soil Science	12	—	12	3785	0.21	66.36
58.	Canadian Jr. of Genetics & Cytogenetics	10	1	11	3796	0.19	66.55
59.	Oil Seed Journal	1	10	11	3807	0.19	66.74
60.	HAU Journal of Research	9	2	11	3818	0.19	66.94
61.	Journal of Agriculture (Cambridge)	7	4	11	3829	0.19	67.13
62.	Tropical Agriculture	7	4	11	3840	0.19	67.32
63.	Journal of Oil Technology Asson. of India	10	-	10	3850	0.18	67.50
64.	Plant Disease Reporter	9	1	10	3860	0.18	67.67
65.	Karnataka Journal of Agricultural Science	6	4	10	3870	0.18	67.85

66.	Canadian Journal of Botany	9	1	10	3880	0.18	68.02
67.	Science	9	1	10	3890	0.18	68.20
68.	Field Crop Abstract	5	4	9	3899	0.16	68.36
69.	Journal of Economic Entomology	5	4	9	3908	0.16	68.51
70.	Journal of Genetics	6	2	8	3916	0.14	68.65
71.	Annals of Applied Biology	8	-	8	3924	0.14	68.79
72.	Journal of Biol. Control	4	4	8	3930	0.14	68.93
73.	Science & Culture	6	2	8	3940	0.14	69.07
	Total	2817	1123	3940	—	—	—
74.	17 Jrs. with 7 references each	49 (7)	70 (10)	119	4059	2.09	71.16
75.	18 Jrs. with 6 references each	84 (14)	24 (4)	108	4167	1.89	73.05
76.	17 Jrs with 5 references each	65 (13)	20 (4)	85	4252	1.49	74.54
77	39 Jrs with 4 references each	84 (21)	72 (18)	156	4408	2.73	77.28
78	66 Jrs with 3 references each	105 (35)	93 (31)	198	46.6	3.47	80.75
79.	206 Jrs with 2 references each	292 (146)	120 (60)	412	5018	7.22	87.97
80.	686 Jrs with 1 references each	474 (474)	212 (212)	686	5704	12.03	100
	Grand Total 1122 Journals	1153 3970	611 1734	1764 5704	—	—	

5.6 Collaboration Coefficient of Citation

The tables 5 and 6 chapter show authorship pattern of references given in MAs and SCs of JOR during 12 years from 1994-2004. Table 5 gives authorship pattern of references in MAs during this period. It reveals that collaboration coefficient is very high during all the years ranging between 0.76 to 0.84. This is to note that higher the value of collaboration coefficient, less are the number of single authored papers. This trend shows that collaboration among scientists is very high. Only

18.9% references are single authored while 81.1% papers referred are written jointly. The table also reveals that 39.3% papers referred are two authored papers and 0% are 3 authored papers. More than 3 authors have authored % of papers

Similarly table 5 shows authorship pattern of references given in SC only 16.67% papers are single authored while 66.94% papers have been written by two and three authors only. Collaboration coefficient ranges from 0.77 to 0.89.

Similarly authorship pattern of books cited in articles have been analyzed in Table 6. 55.8% and 54.3% books cited by MA and SC respectively are single authored. The collaboration coefficient is quite low ranging from 0.27 to 0.58 only for books.

The degree of collaboration has also been calculated on the basis of total articles and total authorship cited in the JOR as below.

(a) Joint authors: Total articles MAs 5642-1699 = 3943

SCs 2451-703 = 1748

Total 8093-2402 = 5691

$$So \ C = \frac{5691}{5691+2402} = 0.70$$

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

Where,

C = degree of collaboration in a discipline.

Nm = number of multi authored research paper in the discipline published during a year,

Ns = number of single authored research papers in the discipline during the period.

(b) Joint authors: Total authorship MAs 12684-1699 = 10985

SCs 5531-703 = 4828

Total 18215-2402 = 15813

$$\text{So } C = \frac{15813}{2402 + 15813} = 0.87$$

$$C = \frac{N_m}{N_m + N_s}$$

Where,

C = degree of collaboration in a discipline.

N_m = number of multi authored research paper in the discipline published during a year,

N_s = number of single authored research papers in the discipline during the period.

Thus the overall degree of collaboration in citation study of oilseeds research is 0.70 for total articles and 0.87 for total authorship. These joint research dominate our single research in agriculture.

Table 5 – Authorship Pattern of references. (Main Articles and Short Com.): Journals

Sr. No.	Year & Vol.	Single Author		Two Authors		Three Authors		Four Authors		Five Authors		Six Authors		Seven Authors		G. Total	% Total N=5704	Total Authorship	Mean authorship	Coll. Coeff. *	
		A1	A2	A3	A4	A5	A6	A7	MA	SC	MA	SC	MA	SC	MA						SC
1.		MA	SC	MA	SC	MA	SC	MA	SC	MA	SC	MA	SC	MA	SC	MA+SC	--	--	--	--	--
2.	1993/10	72	23	89	32	21	3	4	2	--	--	2	--	2	--	402	7.05	906	2.25	0.76	
3.	1994/11	45	17	71	25	28	13	3	3	3	3	1	1	1	--	362	6.35	879	2.43	0.83	
4.	1995/12	38	14	59	39	18	11	6	3	3	--	1	--	--	--	323	5.66	781	2.42	0.84	
5.	1996/13	45	17	61	41	33	14	5	4	4	1	--	--	1(8)	358	6.28	887	2.48	0.83		
6.	1997/14	75	19	98	22	50	11	11	--	4	--	--	--	--	507	8.89	1211	2.39	0.81		
7.	1998/15	72	11	100	28	44	11	16	3	4	4	4	1	--	490	8.59	1229	2.51	0.83		
8.	1999/16	79	25	148	69	76	47	33	23	11	5	3	2	1	--	522	9.15	1248	2.39	0.80	
9.	2000/17	59	28	104	42	50	17	11	3	1	1	1	--	1(8)	530	9.29	1309	2.47	0.84		
10.	2001/18	64	20	130	44	96	29	39	11	9	5	--	1	1	--	449	7.87	1090	2.43	0.81	
11.	2002/19	57	36	122	71	85	32	50	31	11	5	4	3	2	1	510	8.94	1297	2.54	0.82	
12.	2003/20	89	35	142	90	101	59	51	40	10	5	5	1	4(7) 2(8) 1(16)	635	11.13	1574	2.48	0.80		
13.	2004/21	56	44	138	104	92	65	47	27	16	11	6	5	4	1	616	10.80	1587	2.58	0.84	
14.	Total %	751 13.17	289 5.0	1560 27.35	700 12.2	103 1.9	461 8.1	464 8.1	212 3.7	113 1.9	49 0.8	31 0.55	19 0.3	19 0.33	4 0.07	5704 100	100	13998	2.45	0.84	
15.	Authorship	751	289	3120	140	138	185	185	848	565	245	186	114	115	30	13998	--	--	--	--	--
	% n =139 (96)	5.37 6	2.0 6	22.29	0.0 0	2.1 2	9.8 8	3.2 6	6.0 6	4.0 4	1.7 5	1.33 11	0.8 1	0.82 0.21	0.21	100	--	--	--	--	--

$$* \frac{\sum(A2 \text{ to } A7) - A1}{\sum(A2 \text{ to } A7)}$$

Table 6 – Authorship Pattern of references. (Main Articles & Short Com.): Books

Sr. No.	Year & Vol.	Single Author		Two Authors		Three Authors		Four Authors		Five Authors		Six Authors		Seven Authors		G. Total	% Total N=1156	Total Authorship	Mean authorship	Coll. Coeff. *	
		A1	SC	A2	MA	SC	MA	SC	A3	MA	SC	A4	MA	SC	A5						MA
1.	1993/10	35	12	8	11	6	2	5	2	1	1	1	1	1	1	83	7.18	148	1.78	0.43	
3.	1994/11	28	7	13	3	6	3	2	2	1	1	1	1	1	62	5.36	102	1.65	0.44		
4.	1995/12	16	8	4	5	1	1	1	1	1	1	1	1	1	36	3.11	55	1.53	0.86		
5.	1996/13	33	12	8	7	4	3	4	3	1	1	1	1	1	73	6.32	125	1.71	0.38		
6.	1997/14	35	6	14	8	7	3	2	2	1	1	1	1	1	75	6.49	123	1.64	0.67		
7.	1998/15	33	11	29	4	4	1	9	1	1	1	1	1	2	96	8.30	194	2.02	0.77		
8.	1999/16	41	29	18	6	4	5	3	1	3	1	1	1	1	112	9.69	194	1.73	0.64		
9.	2000/17	44	19	16	8	10	3	7	2	2	2	2	2	1	111	9.60	203	1.83	0.69		
10.	2001/18	36	16	18	12	10	3	6	1	1	1	1	1	1	104	9.00	194	1.87	0.73		
11.	2002/19	51	12	19	8	4	3	1	2	1	1	1	1	1	102	8.82	156	1.53	0.53		
12.	2003/20	57	20	36	8	13	2	7	2	2	2	4	4	1	153	13.24	295	1.93	0.74		
13.	2004/21	48	31	28	17	12	5	4	1	1	1	1	1	2	149	12.89	265	1.78	0.70		
14.	Total %	457	183	211	97	81	33	46	15	6	6	6	6	1	1156	100	2054	1.78	0.45		
15.	Authorship	457	183	422	194	243	99	184	60	30	30	36	36	6	91	19	2054	--	0.69		
	% n=2054	22.25	8.91	20.55	9.44	11.82	4.82	8.96	2.92	1.46	1.46	1.75	0.29	0.43	0.93	100	--	--	--		

$$* \frac{\sum(A2 \text{ to } A7) - A1}{\sum(A2 \text{ to } A7)}$$

Table 7 – Collaborations patterns of cited References (Main Articles & Short Communication)

Sr. No.	Authors	Journals/ Periodicals		Books / Monographs		Con. / Seminars / Workshops/ Symp., Proc.		Others		Total MA+SC	% Total n=8095	Total Authorship	Mean Authorship
		Authorship		Authorship		Authorship		Authorship					
Col code		MA	SC	MA	SC	MA	SC	MA	SC	--	--	Y	Y+X
1.	Single Author	751	289	457	187	131	55	360	176	2402	29.68	2402	1.00
	Two Authors	1560	700	211	97	112	40	74	39	2833	35.00	5666	2.00
3.	Three Authors	1032	461	81	33	52	21	43	24	1747	21.59	5241	3.00
4.	Four Authors	464	212	46	15	19	10	32	7	505	9.95	3220	4.00
5.	Five Authors	113	49	6	6	13	2	2	4	193	2.38	965	5.00
6.	Six Authors	31	19	6	1	7	2	4	--	70	0.86	420	6.00
7.	Seven Authors	19	2(8) 2	12	2	1	--	3	4	43	0.54	303*	7.05
8.	Total	3970	1736*	819	227	335	130	518	250	8095*	100	18217*	2.25
9.	Coll Coff.	0.81	0.83	0.44	0.18	0.61	0.58	0.31	0.30	0.70	--	--	--

5.7 Geographical Distribution of Cited References

The paper has also studies geographical distribution references cited in the articles during the period. Table 8 reveals that India, USA, The Netherlands have 3002 (52.62), 706 (12.38%) and 142 (3.12%) citations from periodicals respectively UK is at 6th place. Contribution from other countries is not much significant.

Table 8 – Geographical distribution citation

Sr. No.	Name of Country	No.of Citations M A	No.of Citations SC	Total MA +SC	Cumulative Citations	% of Citations	% of Cumulative Citations	Rank
1.	India	2058	944	3002	3002	52.62	52.62	I
2.	USA	531	175	706	3708	12.38	65.00	II
3.	The Netherlands	118	60	178	3886	3.12	68.13	III
4.	Germany	79	72	151	4037	2.65	70.77	V
5.	Scotland	28	10	38	4075	.67	71.44	VIII
6.	U.K.	113	43	156	4231	2.73	74.18	IV
7.	Canada	54	3	57	4288	1.00	75.18	VI
8.	Australia	39	12	51	4339	0.89	76.07	VII
9.	D.M.	19	19	38	4377	0.67	76.74	VIII
10.	DK	12	12	24	4401	0.42	77.16	IX
11.	Unidentified	919	384	1303	5704	22.84	100	--
12.	Grant Total	3970	1734	5704	--	100	--	--

Note: I = India, USA=United State of America, NL= Nederland Land, Ger =Germany, SL = Scotland, UK = United Kingdom, Can = Canada, Aut= Australia, Dm = Denmark.

5.8 Indian V/s Foreign Journals

Table 9 shows that there are only 485 Indian Journals (43.23%) while 637 (56.77%) are foreign journals. It reveals that foreign journals are still favoured documents of researchers. But in first ten core journals, only 2 foreign journals appear in the list (Table 4). These ten core journals cover 40.36% citations while the two foreign journals cover only 6.11% citations. Similarly if we examine list of 20 journals in the list, 50.37% citations are covered by them but have only 7 foreign journal titles. (See also T-4)

Table 9: Indian & Foreign Journals

Journals	Main Articles	Short Communication	Total	%
Indian Journals	326 (43.94)	159 (41.84 %)	485	43.23
Foreign Journals	416 (56.06)	221(58.16 %)	637	56.77
Total	742 (100)	380(100)	1122	100

6. Conclusion

On the basis of this study we can conclude that joint authorship is new trend of research in oil seed sciences now a days. There are very few core periodicals which can be subscribed which can fulfil more than 50% demand of research scholars. With the above study we can infer that: -

1. Collaboration coefficient is high for references from periodicals. It means scientists collaborate together in oil seed research and publish more and more joint authored papers in journals
2. For books / monographs, seminars papers and others, single authorship is still preferred.
3. Find out periodicals to save huge amount.
4. Foreign periodicals are still referred in oilseeds research and can be subscribed on consortia basis, if possible.
5. References from web are not common at the present research scholars may use them more and more.

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About Authors

Dr. Surendra Kumar, Documentation Officer, Directorate of Soybean Research, (ICAR), Khandwa Road, Indore – 452017.
E-mail: skumar9861@rediffmail.com

Prof. S Kumar, Ex professor and Head, SS Library & Information Science, Vikram University, Ujaain-10 (M.P.).
E-mail: skumarram2000@yahoo.co.in