

## PATTERN OF INFORMATION USE BY INDIAN ENTOMOLOGISTS

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*Discusses the pattern of information use by scientists in the field of entomology through citation analysis of Indian Journal of Entomology for the year 1989. Identifies the various sources of information and their country of origin. A ranked list of Indian entomology journals and another ranked list of journals, irrespective of their country of origin, in the field of entomology from the viewpoint of use by the Indian entomologists are given.*

### INTRODUCTION

The study of pattern of bibliographic references reveals the importance of various sources in the particular field [1] which indirectly helps in procuring reference materials according to the study habit of the scientists. This is necessary to make the procurement of sources in the library more cost effective [2]. Rating of journals through citation analysis in various fields of science have already been reported [3-13]. Since there was no such study reported earlier in the field of entomology, the present study was undertaken to prepare a ranked list of entomology journals from the viewpoint of use of references by the Indian entomologists.

### MATERIALS AND METHODS

Indian Journal of Entomology is taken as source of this study as this journal is outstanding in its coverage and is intended mainly to publish original research papers exclusively in the field of entomology. The citation counting of Indian Journal of Entomology, Vol.54, 1989 yielded a total of 981 citations in 105 articles and short notes as shown in Table 1 and Fig.1.

Out of the total of 981 citations 407 are from Indian sources which form 41.1% of the total citation count and are distributed as shown in Table 2 and Fig. 2.

India having the highest number of sources is followed by USA and UK. A total of 214 (23.05%) citations were from US sources; 9.5% citations were from British sources and rest 23.6% were from other countries.

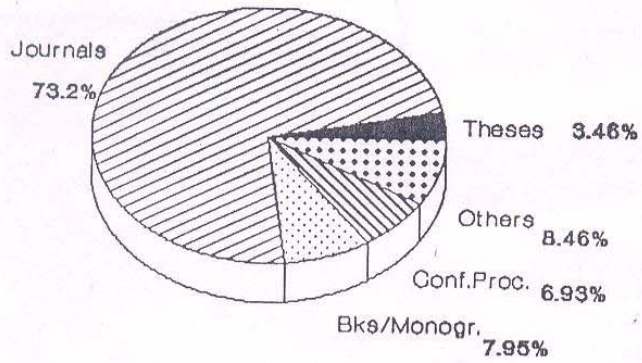
It is observed that major sources of information were the journals which constitute 73.9% of the

Table 1

*Distribution of Sources of Citations*

Sl. No.	Item	Total Citations	Percentage out of total citations
1.	Journals	718	73.2%
2.	Books/monographs	78	7.95%
3.	Theses	34	3.46%
4.	Conf. Proceedings	68	6.93%
5.	Others	83	8.46%
Total		981	100.0%

**Fig.1 Distribution of Forms of Citations**



**Fig.2 Distribution of Sources of Indian Citations**

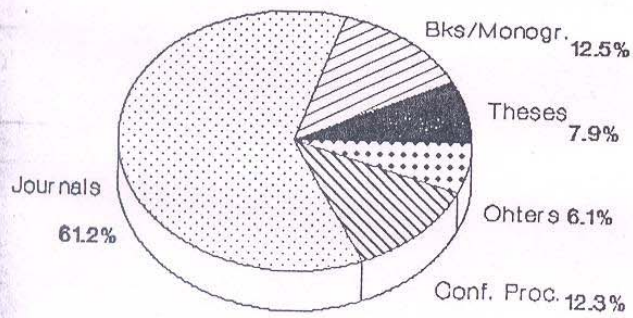


Table 2

*Distribution of Sources of Indian Citations*

Sl. No.	Item	Total Citations	Percentage out of Total Citation
1.	Journals	249	61.2%
2.	Books/monographs	51	12.5%
3.	Theses	32	7.9%
4.	Conf. proceedings	50	12.3%
5.	Others	25	6.1%
Total		407	100.0%

Table 3

*Citation-wise Distribution of Percentage of Journals*

Percentage of Journals (out of 214 titles)	Number of citations received
7.91%	7 and above
3.74%	6
2.80%	5
3.27%	4
6.08%	3
14.96%	2
61.24%	1

Fig. 3 - Obsoliscence of Entomology literature

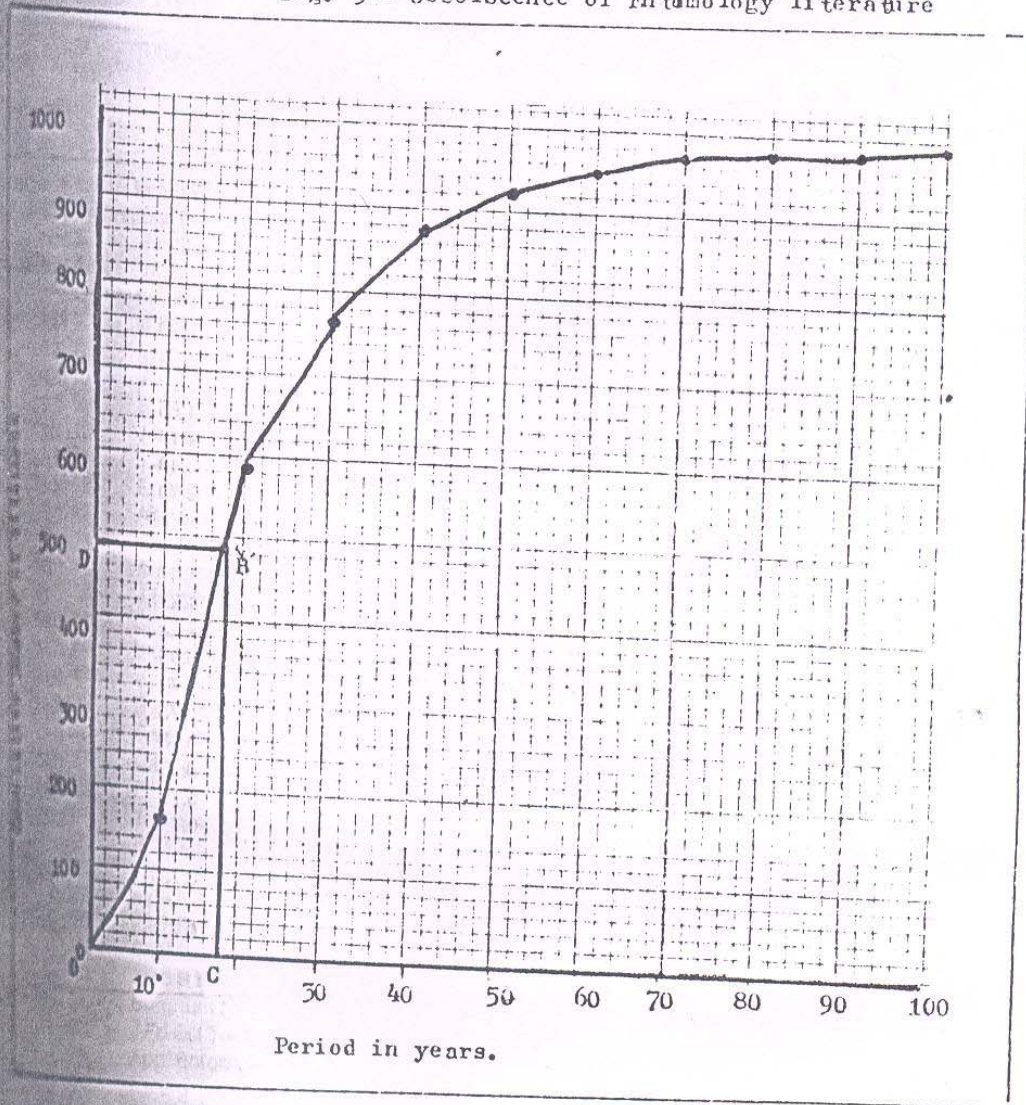


Table 4

*Ranked List of Indian Entomology Journals*

Sl. No.	Title of Journal	Total Citations	% out of 981 total ref.	% out of 407 Indian ref.	% out of 718 from journals
1.	Indian J Entomol	105	10.73	25.79	14.62
2.	Pesticides	36	3.66	8.84	5.01
3.	Indian J Agric Sci	28	2.85	6.87	3.90
4.	Madras Agric J	19	1.95	4.66	2.65
5.	Indian J Nematol	17	1.73	4.17	2.37
6.	Bull Grain Technol	14	1.45	3.43	1.95
7.	Entomon	11	1.12	2.70	1.53
8.	J entomol Res	7	0.71	1.71	0.97
9.	Indian J PI Protection	6	0.61	1.47	0.84
10.	Sci Culture	6	0.61	1.47	0.84
11.	Indian J Ecol	5	0.50	1.22	0.71
12.	Indian J exp Biol	5	0.50	1.22	0.71
13.	J Fd Sci & Technol	4	0.40	0.98	0.54
14.	Curr Sci	3	0.30	0.73	0.40
15.	Indian Farming	3	0.30	0.73	0.40
16.	Indian J Hort	3	0.30	0.73	0.40
17.	Indian J Zool	3	0.30	0.73	0.40
18.	Indian Oil Seed J	3	0.30	0.73	0.40
19.	J Maharashtra agric University	3	0.30	0.73	0.40
20.	J Res, Haryana Agri University	3	0.30	0.73	0.40
21.	Pestology	3	0.30	0.73	0.40

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Table 5

Ranked List of Entomology Journals Both from India and Abroad

Sl. No.	Title of Journals	Total Citations	% Out of 981 total ref.	% Out of 407 Indian ref.	% Out of 718 ref. from journals
1.	Indian J,Entomol	105	10.70	25.80	14.62
2.	J Economic Entomol	43	4.38	11.11	5.99
3.	Pesticides	36	3.66	8.84	5.01
4.	Indian J Agric Sci	28	2.85	6.87	3.90
5.	Madras Agric J	19	1.93	4.66	2.65
6.	Bull Entomol Res	19	1.93	4.66	2.65
7.	Indian J Nematol	17	1.73	4.17	2.37
8.	J Agric Fd Chem	15	1.52	3.68	2.09
9.	Bull Grain Technol	14	1.42	3.43	1.95
10.	J Insect Physiol	14	1.42	3.43	1.95
11.	J Stored Prod Res	14	1.42	3.43	1.95
12.	Entomon	11	1.12	2.70	1.53
13.	Ann Entomol Soc Am	11	1.12	2.70	1.53
14.	Envir Entomol	10	1.01	2.45	1.39
15.	Ann Rev Entomol	8	0.81	1.96	1.11
16.	J Entomol Res	7	0.71	1.71	0.97
17.	Science	7	0.71	1.71	0.97
18.	Indian J PI Protection	6	0.61	1.47	0.84
19.	Sci Culture	6	0.61	1.47	0.84
20.	Rev of Entomol	6	0.61	1.47	0.84
21.	Entomologist's Newslett	6	0.61	1.47	0.84
22.	Canadian Entomol	6	0.61	1.47	0.84
23.	Entomol Exp Appl	6	0.61	1.47	0.84
24.	Tr R Entomol Soc	6	0.61	1.47	0.84
25.	Ecology	6	0.61	1.47	0.84
26.	Indian J Ecol	5	0.50	1.22	0.70
27.	Indian J Exptl Biol	5	0.50	1.22	0.70
28.	FAO PI Protection Bull	5	0.50	1.22	0.70
29.	PANS	5	0.50	1.22	0.70
30.	Proc R Entomol Soc	5	0.50	1.22	0.70
31.	Sorghum Newslett	5	0.50	1.22	0.70
32.	J Fd Sci Technol	4	0.40	0.98	0.56
33.	Appl Entomol Zool	4	0.40	0.98	0.56
34.	Nature	4	0.40	0.98	0.56
35.	Pestic Sci	4	0.40	0.98	0.56
36.	J Ass Offi Agric Chemists	4	0.40	0.98	0.56
37.	Physiol Zool	4	0.40	0.98	0.56
38.	Proc Nat Acad Sci	4	0.40	0.98	0.56
39.	Curr Sci	3	0.30	0.73	0.42
40.	Indian Farming	3	0.30	0.73	0.42
41.	Indian J Hort	3	0.30	0.73	0.42
42.	Indian J Zool	3	0.30	0.73	0.42
43.	Indian Oil Seed J	3	0.30	0.73	0.42
44.	J Maharashtra Agric Univ	3	0.30	0.73	0.42
45.	J Res, Haryana Agric Univ	3	0.30	0.73	0.42

46.	Pestology	3	0.30	0.73	0.42
47.	Canadian J Zool	3	0.30	0.73	0.42
48.	J agric Res, China	3	0.30	0.73	0.42
49.	Z Angew Entomol	3	0.30	0.73	0.42
50.	Int Pest Control	3	0.30	0.73	0.42
51.	J Biol Chem	3	0.30	0.73	0.42
52.	Qd J Agric, Anim Sci	2	0.20	0.50	0.29
53.	Radiat Res	2	0.20	0.50	0.29
54.	Bull Soc Entomol	2	0.20	0.50	0.29
55.	Entomophaga	2	0.20	0.50	0.29
56.	Agric Res J Kerala	2	0.20	0.50	0.29
57.	Andhra agric J	2	0.20	0.50	0.29
58.	Bull of Entomol	2	0.20	0.50	0.29
59.	GAU Res J	2	0.20	0.50	0.29
60.	Geobios	2	0.20	0.50	0.29
61.	Indian J Sericulture	2	0.20	0.50	0.29
62.	Oriental Insect	2	0.20	0.50	0.29
63.	Pulse Crop Newslett	2	0.20	0.50	0.29
64.	South Indian Hort	2	0.20	0.50	0.29
65.	Pyrethrum Post	2	0.20	0.50	0.29
66.	Malayasian Nature J	2	0.20	0.50	0.29
67.	Z Naturfsch	2	0.20	0.50	0.29
68.	J agric Res, Pakistan	2	0.20	0.50	0.29
69.	Intt Rice Res Newslett	2	0.20	0.50	0.29
70.	Analyst	2	0.20	0.50	0.29
71.	Ann appl Biol	2	0.20	0.50	0.29
72.	J Animal Ecol	2	0.20	0.50	0.29
73.	J exp Biol, UK	2	0.20	0.50	0.29
74.	Tr entomol Soc	2	0.20	0.50	0.29
75.	Biol Bull	2	0.20	0.50	0.29
76.	Bull entomol Soc Am	2	0.20	0.50	0.29
77.	Hilgardia	2	0.20	0.50	0.29
78.	J Off analyt Chemist	2	0.20	0.50	0.29
79.	J NY entomol Soc	2	0.20	0.50	0.29
80.	Medit PI Protection Organ Bull	2	0.20	0.50	0.29
81.	Pest Control	2	0.20	0.50	0.29
82.	Scientific American	2	0.20	0.50	0.29
83.	Soil Sci	2	0.20	0.50	0.29
	Rest 131 titles out of 214 titles	1	0.10	0.24	0.14

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Table 6

*Rankwise Distribution of Journal Citations*

Rank No.	No. of Citations	No. of Journals	Cumulative No. Journals	Cumulative No. Citations
1	105	1	1	105
2	43	1	2	148
3	36	1	3	184
4	28	1	4	212
5	19	2	6	250
6	17	1	7	267
7	15	1	8	282
8	14	3	11	324
9	11	2	13	346
10	10	1	14	356
11	8	1	15	364
12	7	2	17	378
13	6	8	25	426
14	5	6	31	456
15	4	7	38	484
16	3	13	51	523
17	2	32	83	587
18	1	131	214	718

Table 7

*Chronological Distribution of Cited Articles*

Age of Citations (Years)	No. of Citations	Cumulative No. of Citations
0-10	169	169
10-20	379	584
20-30	225	773
30-40	105	878
40-50	43	921
50-60	34	955
60-70	16	971
70-80	5	976
80-90	3	979
90-100	2	981



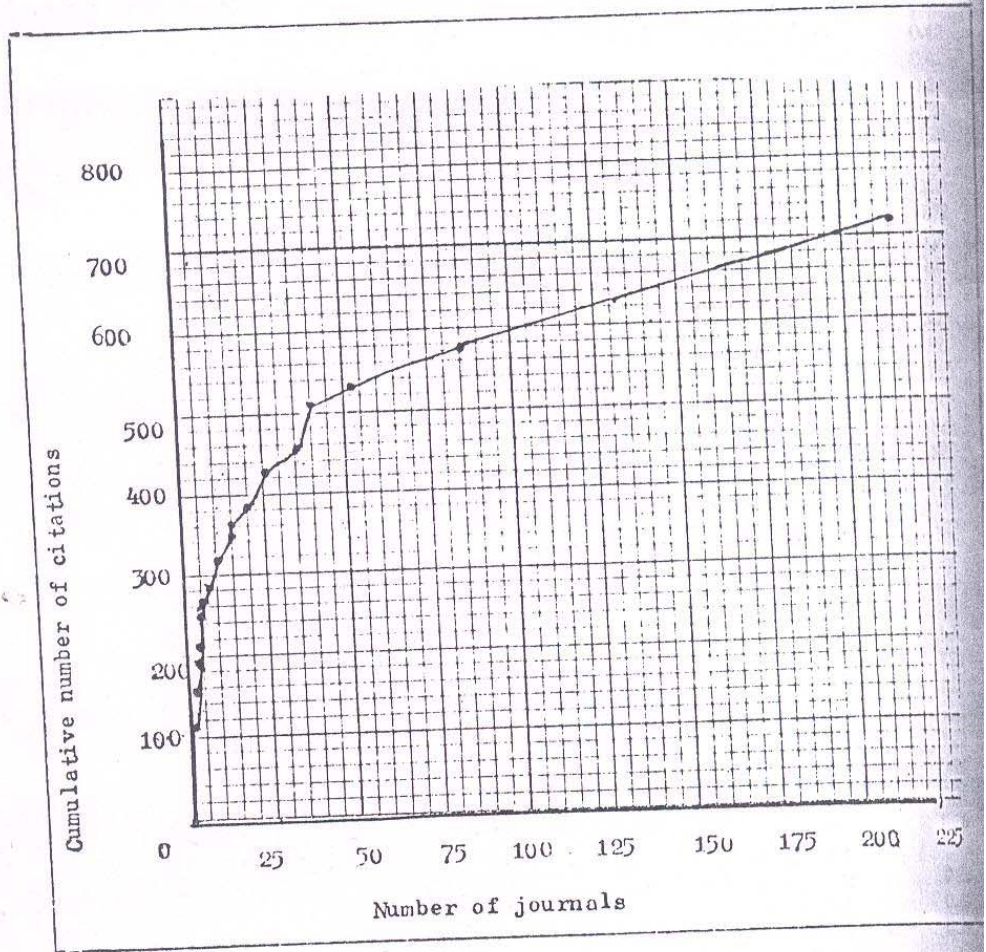


Fig. 4 Bradford Law of D distribution

total citations. These 718 citations are to only 214 journal titles. Out of these 214 titles 58 (27.1%) are of Indian origin.

On further analysis, it is also seen that only 7.9% of the titles (out of 214 titles) were cited more than seven times out of which 3.7% were Indian, 3.7% were US and 0.5% were British titles. Percentage of journals arranged according to number of citations they received can be seen in Table 3.

A rank list of Indian entomology journals and another rank list of entomology journals irrespective of their country of origin are given in Table 4 and Table 5 respectively. The journals are arranged according to the number of citations received. Indian Journal of Entomology with 105 citations topped both the rank lists whereas Journal of Economic Entomology with 43 citations occupied second place in the second list. Pesticides with 36 citations occupied second place in the first list and third place in the second list. A total of 21 Indian journals are listed in Table 4 according to their rank. Table 5 shows ranked list of 83 journals of both Indian and foreign origin which received three or more citations.

#### OBSCOLESCENCE OF LITERATURE

The Chronological distribution of the cited articles in the field of entomology based on the present study is shown in table 7. The rate of obsolescence of literature based on citation analysis indicates that books as old as 99 years and journals upto 90 years old were used by the Indian entomologists. More than 50% of citations were to publications published within 0-20 years and 91% of the citations were to those published within 0-40 years. Rest 9% citations were distributed to 41-100 years old publications. The data was plotted on a plain graph paper taking age of citations on the X axis and the cumulative number of citations on the Y axis (Fig.3). To find the half life, a line parallel to Y axis was drawn from the point D to meet the curve at B (D represents half of the total citations). Then, from the point B another line was drawn to meet the X axis at point C. OC represents the half life of literature which is 18-19 years.

Table 8 shows the rankwise distribution of number of journals along with the cumulative number of citations. The data was plotted on a plain graph paper with cumulative number of journals on the X

axis and cumulative number of citations on the Y axis to test the scattering of information in this field of science. The graph so obtained was hyperbolic (Fig.4) and is in accordance with the Bradford's Law of scattering.

#### CONCLUSION

Indian Journal of Entomology is the highly cited journal in the field followed by the Journal of Economic Entomology with 105 and 43 citations respectively. Major portion of the citations are from journals (73.9%) and a total of 41.7% citations are from Indian sources followed by 23.1% from USA. Though the age of citations are ranging between 1891 to 1989, i.e., within a period of 100 years yet 91.2% are within the time space of 0-40 years. The half life of the entomology literature is calculated as 18-19 years. The scattering of the journal literature is in accordance with the Bradford's Law of scattering.

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