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IRIS: SCIENTOMETRIC ANALYSIS ON IRIS FROM SCOPUS AND WEB OF SCIENCE

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ABSTRACT

The scientometric research on "Iris" is vital as it is an important organ of eye, for which all the relevant data were downloaded from "Scopus" and "Web of Science". The importance of scientometric analysis has been given along with the brief information on iris in the introductory part. A few literatures were reviewed as model for the analysis. Objectives were framed for the stipulated 10 years, and a pre-defined methodology implemented to retrieve the results. The analysis part reveals the year wise assessment of records, source wise records, language wise records, authorship pattern, application and testing of Lotka's Law and to retrieve the continent wise publications. It is concluded that the ministry of human resource development should allocate more funds to encourage the scientists to do many more research on "iris" to support the future generation to have good vision during the span of long life.

KEYWORDS: Iris: Scientometric Analysis on Iris From Scopus and Web of Science

INTRODUCTION

Scientometric analysis gained impetus in recent years due to the rapid growth of literature in all spheres of scientific research. Scientometric reveals the fact of the growth of literature in all aspects on any particular subject and helps the research community to gain access to clarity of the subject. All the data related to "Iris" are downloaded for this research work with a limitation of 10 years from 2005 to 2010, indexed in Scopus and the Web of Science. Different types of scientometric and statistical tools applied to complete the analysis and the results were interpreted in the analysis part of this research article.

The ***iris*** (plural: **irides** or ***irises*)** is a thin layer, circular in structure around the pupils of an eye, responsible for controlling the diameter and size of the pupils and control the amount of light reaching the retina. "Eye color" is based on the color of "Iris", which can be green, blue, or brown. In some cases it can be hazel (a combination of light brown, green and gold), grey, violet, or even pink. Iris plays important role in automated biometric system. In biometric system, there are chances of retina to malfunction by infection, but iris identification system never fails in this regard. As "Iris" plays vital role to control the diameter of the pupil, shows perfection in biometric identification system, determines the color of the eye, it has to be protected with uttermost-care.

REVIEW OF LITERATURE

The study was about to appraise the differences among major research fields in SCOPUS and WOS based on a standardized classification of fields and assessed for the case of an entire country (Slovenia). All the documents were analyzed and citations received by authors actively engaged in research in Slovenia between 1996 and 2011 (50,000 unique

documents by 10,000 researchers). SCOPUS leads over WOS in the number of documents as well as citations in all research fields. Engineering & technology reveals only half the citations per document compared to the social science and humanities. Agriculture is found in the middle. The established differences between databases and research fields provide the Slovenian research funding agency with additional criteria for a more balanced evaluation of research.

This article attempts to provide a comprehensive comparison of these databases to answer frequent questions raised by the researchers, such as: How Web of Science and Scopus are different? In which aspects these two databases are similar? Or, if the researchers are forced to choose one of them, which one should they prefer? The comparison of WOS and Scopus discovers that WOS has strong coverage which goes back to 1990 and most of its journals written in English. However, Scopus covers a superior number of journals but with lower impact and limited to recent articles. Although there is a high association between both databases, it is suggested to investigate the perceptions of authors and researchers on both databases to find the reasons which make them to use one database more than the other one. It could be helped databases to improve their features to provide better facilities.

The article presents a comprehensive overview of the field of “Iris” recognition research using bibliometric study on the basis of 1,354 documents written in English, published between 2000 and 2012. Scopus was used towards the information retrieval of leading authors, most cited papers, significant conventions, leading journals, outstanding research topics and enterprises and patents. Research topics are classified into three main categories: ongoing, emerging, and decreasing according to their corresponding number of publications over the period under study. An analysis of these indicators suggests there have been major advances in iris recognition research and also reveals promising new avenues worthy of investigation in the future.

The bibliometric study is on the literature output of Prof. Lalji Singh, an eminent Indian Scientist in the field of genome analysis, DNA finger printing etc.,. The study is based on the data indexed in Scopus and Web of Science. 222 unique articles of him indexed with an average of 7-8 articles per year. Out of that 18 articles appeared in Indian Journals. His most of his contribution is with high impact factor journals and that too in collaboration with his fellow scientists. The h-index is 30 in both the databases. The research study concluded that Prof. Singh can be a “role model” for the younger researchers to follow.

The Central Tuber Crops Research Institute publications of 1076 records were taken from 2000 to 2010 for the scientometric analysis. The study reveals that the journal articles dominated the other type of publications with 318 articles. The foreign journals contributed maximum number of articles. The multi authored papers have high degree of collaboration in the science field. The analysis revealed that the female contributions are more lower than the male and therefore, suggested that the female researcher are to be encouraged to do many more research. Finally, it is concluded that the compilations of bibliographic database of the publications of CTCRI is very much essential.

OBJECTIVES OF THE STUDY

- To give a clear picture about the number of publications on “Iris”, which will be useful to the scientists doing research on “Iris” about the contemporary growth of literature
- To assess the relationship between the year wise publication of records indexed in Scopus and Web of Science

- To know the source wise publications indexed in Scopus and Web of Science
- To retrieve the language wise publication of records indexed in Scopus and Web of Science
- To know the authorship pattern of records, application and testing of Lotka's law
- To forecast the number of records to be published on "Iris" in future
- To know Continent wise publication of records on "Iris".

LIMITATION

The years of study for the research work is limited to 10 years (i.e, from 2005 to 2014) on the research topic "Iris". The records considered for the research analysis is download from the two databases only viz., "Scopus" and "Web of Science".

METHODOLOGY

The data has been downloaded from Scopus and Web of Science. Hits Cite Software, Microsoft Excel and SPSS package were utilized for the analysis of data. Certain statistical test such as U test, Chi square test and Regresstion Test were applied through the cited software's.

ANALYSIS AND INTERPRETATION

Year Wise v/s No. of Records

Table 1

Year	No. of Records of Scopus	No. of Records Wos
2005	1196	686
2006	1289	727
2007	1380	727
2008	1482	762
2009	1591	803
2010	1728	869
2011	1688	892
2012	1803	975
2013	1878	962
2014	1708	908
Total	**15743**	**8311**

The Table 1 reveals that Scopus indexed 15743 number of research publications, whereas, Web of Science, indexed only 8311 research publications. Each and every database bound with their own principles of indexing the research publications. Such valid reasons may be a cause for the variation in the number of publications between 2005 and 2014.

Table 2

Group: Scopus And Wos	N	Mean Rank	Sum of Ranks
SCOPUS	10	15.5	155
WOS	10	5.5	55
Total	**20**		

Table 3

Test	Scopus And Wos
Mann-Whitney U	0
Wilcox on W	55
Z	-3.78
Asymp. Sig. (2-tailed)	0
Exact Sig. [2*(1-tailed Sig.)]	.000[a]

The year wise analysis of the data indexed in two databases from 2005 to 2014 reveals that Scopus consists of more number of records than Web of Science. The mean rank for Scopus is 15.5 and for Web of Science are 5.5.

Hypothesis: Ho There is no significant difference between the publications on Iris indexed in Scopus and Web of Science.

Table 3 expresses clearly that the Mann-Witney U text result of "0" which is not greater than the P Value of 0.05, therefore, the H0 is rejected and the alternate hypothesis may be accepted. With the proven result, it is interpreted that there is a significant difference between the two databases in the process of indexing of literature on "Iris".

Source Wise V/S Document Wise

Table 4

Type of Records	Scopus	%	Wos	%
ARTICLE	9491	60.29	6547	78.78
CONFERENCE	3783	24.03	428	5.15
REVIEW	982	6.24	428	5.15
LETTER	568	3.61	277	3.33
CONFERENCE REVIEW	198	1.26	6	0.07
NOTE	198	1.26	58	0.70
BOOK CHAPTER	166	1.05	13	0.16
ARTICLE IN PRESS	138	0.88	0	0.00
SHORT SURVEY	82	0.52	0	0.00
EDITORIAL	75	0.48	162	1.95
BOOK	45	0.29	64	0.77
ERRATUM	17	0.11	0	0.00
MEETING ABSTRACT	0	0.00	264	3.18
CORRECTION	0	0.00	23	0.28
POETRY	0	0.00	17	0.20
BIOGRAPHICAL-ITEM	0	0.00	16	0.19
MUSIC PERFORMANCE REVIEW	0	0.00	4	0.05
ART EXHIBIT REVIEW	0	0.00	2	0.02
FICTION, CREATIVE PROSE	0	0.00	2	0.02
Total	**15743**	**100.00**	**8311**	**100.00**

The table 4 shows the Source wise distribution of records for both the databases reveals that the majority of the publications are journal articles. Scopus consists of 9491 (60.29%) of journal articles, whereas, Web of Science indexed 6547 (78.78%) number of journal articles from 2005 to 2014. It is also revealed that Scopus indexed 12 types of document, whereas, Web of Science indexed 16 types of document.

Language wise Publications

Table 5

Language	Scopus	Wos
English	13790	7886
Chinese	825	36
German	200	149
Japanese	187	3
French	183	121
Spanish	130	25
Portuguese	92	36
Turkish	67	6
Polish	61	5
Russian	51	8
Czech	31	4
Italian	19	5
Romanian	16	0
Dutch	16	6
Hungarian	16	4
Croatian	14	1
Korean	8	7
Slovak	7	0
Azerbaidzhani	4	0
Serbian	4	2
Hebrew	3	0
Slovene	3	3
Persian	2	0
Arabic	2	0
Lithuanian	2	2
Catalan	1	0
Bulgarian	1	0
Macedonian	1	0
Norwegian	1	0
Icelandic	1	1
Estonian	1	0
Swedish	1	0
Thai	1	0
Esperanto	1	0
Ukrainian	1	0
Afrikaans	0	1
Total	15743	8311

The table 5 shows that the language wise publications of the two databases reveals that English language plays dominant role over the other languages with 13790 number of publications of Scopus and 7886 number of publications of Web of science on “Iris”. But it is very strange that Chinese language publications get the second place in Scopus with a publication count of 825, whereas, German language gets second place in Web of Science with a record count of 149. This may be because of the selection policy of the records such as reviewed, peer-reviewed, and single as well as double blind reviewed, etc., of the two databases.

Authorship Pattern V/S Year wise Records of Scopus

Table 6

No. of Authors	Iris Records in Scopus										
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	TOTAL
1	147	184	168	174	214	220	181	184	202	191	1865
2	273	261	283	310	334	369	317	339	309	306	3101
3	247	265	312	342	348	362	375	365	381	324	3321
4	168	221	237	259	273	260	275	312	346	288	2639
5	133	141	144	151	165	178	207	207	250	197	1773
6	90	92	107	93	101	112	116	157	126	133	1127
7	50	45	46	45	55	81	68	88	99	84	661
8	34	22	41	44	25	55	57	53	49	53	433
9	16	26	9	26	25	22	30	30	40	50	274
10 and above	38	32	33	38	51	69	62	68	76	82	549
Total	**1196**	**1289**	**1380**	**1482**	**1591**	**1728**	**1688**	**1803**	**1878**	**1708**	**15743**

The table 6 shows that out of 15743 number of publications indexed in Scopus, only 1865 publications were published by single author, and the table 6.4.1 shows that out of 8311 number of publications indexed in Web of Science, only 803 number of publications were published by single author. Therefore, in either database, the multi-authored papers played predominant role over the publications published on iris from 2005 to 2014.

Authorship Pattern V/S Year wise Records of Web of Science

Table 7

Authorship Pattern	Iris Records in Web of Science										
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	TOTAL
1	65	80	78	78	80	84	94	89	79	76	803
2	138	125	131	128	128	143	127	147	113	116	1296
3	134	142	142	145	143	150	160	148	163	156	1483
4	103	126	128	118	134	136	136	157	164	158	1360
5	77	86	85	98	115	106	114	118	139	118	1056
6	64	67	68	66	63	89	78	113	90	98	796
7	40	31	28	40	45	56	56	64	70	56	486
8	22	23	29	34	29	36	43	44	39	34	333
9	16	23	10	17	21	13	24	24	32	39	219
10 and above	24	24	28	38	45	56	60	71	73	57	479
Total	**683**	**727**	**727**	**762**	**803**	**869**	**892**	**975**	**962**	**908**	**8311**

Application of Lotka's Law for Scopus and WOS

Table 8

Records of Scopus	Observed Authorship from Scopus	Lotka Prediction	Records of Wos	Observed Authorship from Wos	Lotka Predic-Tion
31	25	0.03	1	200	200
4	24	1.56	1	88	200
3	23	2.78	1	57	200
4	22	1.56	1	46	200
2	21	6.25	1	42	200

8	20	0.39	1	33	200
4	19	1.56	1	32	200
12	18	0.17	1	31	200
14	17	0.13	1	29	200
17	16	0.09	3	27	22
21	15	0.06	3	26	22
46	14	0.01	3	25	22
43	13	0.01	3	24	22
85	12	0	2	23	50
95	11	0	4	22	13
160	10	0	2	21	50
274	9	0	10	20	2
433	8	0	6	19	6
661	7	0	11	18	2
1127	6	0	10	17	2
1773	5	0	15	16	1
2639	4	0	21	15	0
3321	3	0	35	14	0
3101	2	0	31	13	0
1865	1	0	74	12	0
			78	11	0
			159	10	0
			219	9	0
			333	8	0
			486	7	0
			796	6	0
			1056	5	0
			1360	4	0
			1483	3	0
			1296	2	0
			803	1	0

The table 8 shows the application of Lotka's Law to the authorship pattern of the publications on iris indexed in both the database Scopus and Web of Science. The application of Lotka's Law is further tested by Chi square test to ascertain the prediction of law is practically applicable for the author productivity. The details of the test results are as follows:

Testing of Lotka's Law of Author Productivity in Scopus

Hypothesis: Ho There is no significant relationship between the observed authors of IRIS publications of the Scopus database and the prediction of Lotka's Law

Chi Square Test Result:

Table 9: Case Processing Summary

Authors Observed from Scopus v/s Lotka's Law	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
	25	100.00%	0	0.00%	25	100.00%
		Value	df	Asymp. Sig. (2-sided)	Value	df
Pearson Chi-Square		2.500E2[a]	240		0.315	
Likelihood Ratio		91.94	240		1	
Linear-by-Linear Association		6.123	1		0.013	
N of Valid Cases		25				
a. 275 cells (100.0%) have expected count less than 5. The minimum expected count is .04.						

As cited in table 9 the inferred result of 0.315 is greater than the significant value of 0.05, the null hypothesis is accepted. Therefore, it is proved that the prediction of Lotka is failed by means of Chi Square Test for the records publications on "Iris" indexed in Scopus database.

Testing of Lotka's Law of Author Productivity in WOS

Hypothesis: Ho There is no significant relationship between the observed authors of IRIS publications of the Web of Science database and the prediction of Lotka's Law

Table 10

Case Processing Summary						
Authorship Pattern v/s Lotka's Prediction	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
	36	97.30%	1	2.70%	37	100.00%
Chi-Square Tests						
	Value		df	Asymp. Sig. (2-sided)		
Pearson Chi-Square	2.520E2[a]		245	0.366		
Likelihood Ratio	116.767		245	1		
Linear-by-Linear Association	13.701		1	0		
No. of Valid Cases	36					

As cited in table 10 the inferred result of 0.366 is greater than the significant value of 0.05, the null hypothesis is accepted. Therefore, it is proved that the prediction of Lotka is failed by means of Chi Square Test for the publications on iris of Web of Science Database.

Regression Test: Forecasting and Doubling Time of Records of Scopus and WOS Database

Hypothesis: Ho There is no significant relationship between the numbers of publications on "Iris" from 2005 to 2009 and 2010 to 2015 indexed in Scopus.

Regression test has been conducted as a fore-runner to do the forecasting of records as well as to find out the doubling time of the records published on IRIS and indexed in Scopus as well as WOS database.

Table 11

Regression Test for the Scopus Records on IRIS				
Multiple R	0.28	Standard Error	t Stat	P-value
R Square	0.08			
Coefficients				
Intercept	426.76	1936.88	0.22	0.84
X Variable 1	0.55	1.10	0.50	0.65

Since, the P value inferred in table 11 is greater than the critical value of 0.05, the H0 is accepted and it is being proved that there is no significant relationship between the numbers of publications on IRIS indexed in the database Scopus for the first half of the years of 2005-2009 and 2010-2014.

Hypothesis: Ho There is no significant relationship between the numbers of publications on "Iris" from 2005 to 2009 and 2010 to 2015 indexed in Web of Science.

Table 12

Regression Test for the WOS Records on IRIS				
Multiple R	0.3206	Standard Error	t Stat	P-value
R Square	0.10278			
Coefficients				
Intercept	456.69	485.45	0.94	0.42
X Variable 1	0.31	0.53	0.59	0.60

Since, the P value in table 12 is greater than the critical value of 0.05, the H0 is accepted and it is being proved that there is no significant relationship between the publications on IRIS indexed in the database Web of Science for the first half of the years of 2005-2009 and 2010-2014. Therefore, it is inferred and recommended that the possibility of forecasting the future number of publications and the calculation of doubling time of records will not be accurate and such calculation process is absolutely meaningless.

Year Wise V/S Continent Wise Publication of Records of Scopus on Iris

Table 13

Continent	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	TOTAL	%
AFRICA	14	15	13	22	32	68	49	31	59	39	342	2.17
Asia	375	438	453	511	589	569	604	658	609	598	5404	34.33
Europe	371	409	521	510	525	562	532	628	701	672	5431	34.50
North America	359	339	335	350	359	388	358	362	364	303	3517	22.34
South America	46	44	28	55	51	77	72	82	80	42	577	3.67
Oceanic	31	44	30	34	35	64	73	42	65	54	472	3.00
Total Records	**1196**	**1289**	**1380**	**1482**	**1591**	**1728**	**1688**	**1803**	**1878**	**1708**	**15743**	**100.00**

The table 13 reveals the continent wise publication of records of Scopus on iris is that the continent "Europe" publishes more number publications with a record count of 5431(34.50%) and Asia stands in the second place with a record count of 5404 (34.33%) and North America in the third place with a record count of 3517 (22.34%).

Year wise V/S Continent Wise Publications of WOS on Iris

The table 14 reveals that the continent wise publication of records of Web of Science on iris is that the continent "Europe" publishes more number of publication with a record count of 2856 (34.36%) leaving North America in the second place with a record count of 2306 (27.75%) and Asia in the third place with 2231 (26.84%) number of publications.

Table 14

Continent	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	TOTAL	%
Africa	10	12	10	22	25	26	32	39	44	30	250	3.01
Asia	199	203	164	175	205	214	238	269	308	256	2231	26.84
Europe	244	239	278	269	295	304	312	308	301	306	2856	34.36
Oceanic	23	34	21	31	29	34	8	30	34	50	294	3.54
North America	196	222	239	235	218	241	253	246	224	232	2306	27.75
South America	14	17	15	30	31	50	49	83	51	34	374	4.50
Total Records	**686**	**727**	**727**	**762**	**803**	**869**	**892**	**975**	**962**	**908**	**8311**	**100.00**

CONCLUSIONS

Through the analysis of the records on "Iris" indexed in the database "Scopus" and "Web of Science" shows a lot of variations. The reason for the variations may be on the basis of the policy of the publisher towards indexing the literatures published world-wide.

As each and every organ of human being is very precious and considered as a God given gift, and especially, "iris" is a very important organ of eye, the ministry of human resource development of all the countries should allocate more funds to encourage the scientists of life science to do many more researches on iris to make the human-beings to live and lead a happy long life in the earth.

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