Malaysian Journal of Library & Information Science, Vol. 10, no.1, July 2005: 1-18

NIGELLA SATIVA: A BIBLIOMETRIC STUDY OF THE LITERATURE ON HABBAT AL-BARAKAH

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ABSTRACT

This study carried out a bibliometric analysis of the literature on Nigella sativa (Habbat al-barakah or Black seed). The purpose was to study the periodic growth of literature, author patterns, topical focus, and geographic origin of literature on the subject. Twenty related databases and several online catalogues of libraries were searched to identify a final list of 530 citations. This data set was analyzed using various bibliographic characteristics. The findings show the increase in the volume of literature from 1971 onwards starting from one citation per year growing to 46 papers per year during the late 1990s. Most of the literature comes from Medical Sciences and Chemistry. A small core of authors contributed about one-third of the citations. Four-fifths of the citations are the result of collaborative work. About two-fifths of the papers are published by only 36 journals. India and Egypt are the leading contributors to this literature. English is the dominant language.

Keywords: Nigella *sativa*; Habbat al-barakah; Black seed; Kalongi; Medicinal plants; Bibliometric analysis

INTRODUCTION

Plants have always been a major source of nutrition and health care for both humans and animals. The writings on nutritional and medicinal plants go way back to 1500 B.C in Egypt, 800-400 B.C. in Indo-Pakistan, and 500 B. C. in China (Chadwick & Craker, 1988). However, scientific research interest in medicinal plants received a thrust during the mid-1970s when World Health Organization (WHO) proposed the incorporation of traditional medicine into the health care system. In 1978, World Health Assembly called for a comprehensive approach to the medicinal plants that included the designation of research and training centres for the study and use of medicinal plants (Akerele, 1991). As a result of these developments, the quantity of research literature on these plants has been growing steadily worldwide.

Nigella *sativa* (Habbat al-barakah) has been used in the Middle East, South Asia, and the Far East for centuries to treat ailments and as an additive to food, but scientific research on it began to increase only after WHO started paying attention to traditional medicine. The literature on Nigella *sativa* is widely scattered and difficult to identify due to the interdisciplinary nature of research on this plant. There is a need to identify and analyze this literature in order to study its periodic growth, author patterns, research focus and trends, and geographic origin. This can be done through bibliometric analysis of the literature.

There is a large volume of bibliometric studies analyzing the characteristics of specific bodies of literature. This technique can be used to identify research trends and growth of knowledge in various subjects and to forecast publishing trends (Sengupta, 1992). The study of citations indicating documentary information flow in various disciplines help us understand the generation and exchange of information in the scientific domain. Bibliometric analysis can also be used to study "*longitudinal shifts in concept clusters to characterize the succession of theoretical paradigms in fields of research*" (Paisley, 1990, p. 282). Bierbaum et al. (1992), who studied bibliographic records on AIDS, found a change in focus and direction recorded in the growth of literature on AIDS. A study of literature on 'Muslims and Europe' showed a clear shift in topical focus from 1986-1990 to 1992-1996 (Anwar, 2001). Paisley (1990, p. 285) pointed out that "*an increase in database coverage was an indicator of the topic's importance*". Therefore, a demographic study of a defined set of literature can be used to identify its research focus and major trends that may be developing. An investigation of 294 scientists from a number of disciplines on the use of bibliometrics has shown that scientists are interested in such studies (Zus'man, 2000).

REVIEW OF LITERATURE

A search of literature dealing with Nigella *sativa* revealed three bibliographic items. Gerritsma (1989) produced a review of literature on Nigella *sativa* that seemed to be an internal departmental publication. It is not even listed in the online catalogue of the library of the university where it was produced. Every effort to further identify and obtain a copy of this review failed (see note). Details about its scope and coverage is not available. Ruiz (1988) and Sheriff (1999) prepared two short bibliographies on medicinal and spice herbs but the number of plants included in both publications does not point to any significant identification of literature on

Nigella *sativa* in these bibliographies. As far as this researcher knows, neither a comprehensive bibliography nor a bibliometric study of literature on Nigella *sativa* has thus far been reported in the sources consulted. Many bibliometric studies that focus on a defined body of literature in a variety of disciplines share a common methodology. Some of these writings that are important for methodological reasons are mentioned below. Adenaike (1982) analyzed some characteristics of the citations taken from two bibliographies on cowpea covering the period from 1888 to 1973. It was found that the literature doubled every 20 years, English language accounted for 87% of the literature and journal was the most popular medium of publishing. Subbaiah (1984), who studied Indian grape research literature covering 1901-1981, found clustering of research in specific areas, increase in collaborative research, and journals as the main source of information. Meera (1998) studied the characteristics of 4,840 citations on ecological literature published during 1994-1995 in terms of their subject, language and geographic dispersion, and author ranking.

There are three studies that touch on themes closer to the present research. Haiqi (1994) did a bibliometric analysis of 3,006 citations published between 1974 and 1992 on Chinese traditional medicine retrieved from the Medline database focusing on geographic and language dispersion of the literature and ranking of journals that published it. Dhiman & Sinha (2001) studied the nature and growth of literature on ethno-botany published during 1989-1999. Fan (2001) analyzed 10,185 citations dealing with 'neoplasm' covering the period from 1984 to 1998 retrieved from the TCMLARS database (Traditional Chinese Medical Literature Analysis and Retrieval System). The characteristics studied included the neoplasm type, year of publication, author's organizational affiliation, type of literature, and the research grant. In light of this review, and the fact that literature on Nigella *sativa* has not been subjected to bibliometric analysis so far, it is important that this literature is studied in detail in order to understand scholarly interests and activity on this plant.

OBJECTIVES

Nigella *sativa*, as a medicinal and nutritional plant, became the focus of interest among researchers from Biological Sciences, Medical Sciences, Chemistry, Agriculture, and Veterinary Sciences during the early 1970s. Volume of research and publication output on this plant has been increasing since then. The purpose of this study was to investigate the demographic characteristics of the available literature on Nigella *sativa*. It specifically focused on determining the followings: (a) the periodic growth pattern of the literature on Nigella *sativa*; (b) the topical focus of

the literature on Nigella *sativa*; (c) the authorship patterns; (d) the core journals producing this literature; and (e) the geographic origins. Determining these leads to a greater understanding of the research focus and trends related to this important medicinal plant. The findings, in addition to its specific results, create an awareness of trends and focus of research on Nigella *sativa* among scholars in several disciplines. It will clearly bring out the inter-disciplinary nature of research on this plant and make a significant contribution to the literature on traditional medicine. The findings will also motivate potential researchers to work in areas where research is lacking, and should serve as a catalyst to encourage more collaborative research by identifying related research institutions.

METHODOLOGY

The literature on Nigella *sativa*, due to its multi-disciplinary nature, is scattered in a variety of sources. Twenty relevant databases, including AGRICOLA, AGRIS International, BIOSIS, CAB Abstracts, Chemical Abstracts, and MEDLINE, as well as online catalogues of some important libraries, were searched in order to identify related citations. A total of 1,860 citations were retrieved. Each citation and abstract was examined to select relevant material. Full bibliographical details were searched and verified for each citation selected. Procite programme was used to create a bibliographic database of the selected literature. Duplication in citations was removed as each new group of citations was loaded into the Procite programme. Once the potential sources of citations had been exhaustively searched and the selected citations had been added, the Procite database consisted of 530 unique records. It may be pointed that this figure includes seven patents and several publications of descriptive nature. These 530 citations were used to generate needed statistical reports that were used to analyze the literature.

RESULTS AND DISCUSSION

This section presents the results of the analysis of these citations.

Periodic Growth of Literature

The data on periodic growth of literature on Nigella *sativa* are presented in Table 1 in 5-year intervals except the beginning and the last period.

Table 1: Periodic Growth of Literature

Period	Total Citations	Mean Citations Per Year
1964-1965	3	1.5
1966-1970*	4	1.0
1971-1975	34	6.4
1976-1980	41	8.2
1981-1985	53	10.6
1986-1990	42	8.4
1991-1995	104	20.8
1996-2000	233	46.6
2001*	16	16.0
37	530	14.3

*No publication appeared in 1966 while 2001 was not fully covered.

A very limited research interest is displayed during the period up to 1970. Six of the seven items published up to 1970 originate from Indian and Egyptian writers. The volume of literature starts increasing from 1971 onward and continues growing on a steady rate up to 1990. There is a phenomenal jump in the publication output from 1991 onward. This growth is partly due to the WHO policy of encouraging the incorporation of traditional medicine into the health care system (Akerele, 1991). The output grew by 2.48 times during 1991-1995 compared with 1986-1990. It again jumped during 1996-2000 by 2.23 times compared with 1991-1995 and 5.55 times compared with 1986-1990. The years from 1996 to 2000 are the most productive period. The rate of growth of this literature is higher than the one reported for cowpea, i.e., doubling every 20 years (Adenaike, 1982). Will this tremendous growth trend continue during the coming 5-year intervals? It should be satisfying even if it goes steady at a rate closer to 46+ papers per year. However, it is evident that Nigella *sativa* has attracted the attention of many researchers.

Subject Dispersion of Literature

Nigella *sativa*, as a nutritional and medicinal plant, is of interest to researchers from many disciplines including Biological Sciences, Medical Sciences, Chemistry, Agriculture, and Veterinary Sciences. Therefore, topical coverage of this body of literature is so diverse and sometimes so specific in nature that makes it very hard to organize it under subjects of equivalent status. Some databases assign many very specific descriptors to each publication making it difficult to select one of them. Each of these citations was assigned only one subject that was broad in many cases while specific in others depending on the nature of each publication. Topical

distribution of 530 citations shown in Table 2 testifies to the difficulty mentioned above.

Table 2: Subject Dispersion of the Literature

Topics		Citations	%	Topics		Citations	%
1	Anti-microbial activity / agents	44	8.3	17	Metabolism	14	2.6
2	Medicinal properties	40	7.5	18	Oil composition	13	2.5
3	Chemical composition	36	6.8	19	Thymoquinone	12	2.3
4	Animal feed	33	6.2	20	Food chemistry	11	2.1
5	Tissue culture	30	5.7	21	Hypoglycemic effects	11	2.1
6	Plant diseases and their treatment	25	4.7	22	Insecticidal properties	11	2.1
7	Plant growth	25	4.7	23	Digestive system diseases	10	1.9
8	Anti-cancer activity	22	4.2	24	Anti-inflammatory properties	9	1.7
9	Chromosomes	20	3.8	25	Anti-hypertensive properties	7	1.3
10	Cropping systems and crop yields	19	3.6	26	Seed proteins	7	1.3
11	Fatty acids	19	3.6	27	Anti-asthematic peroperties	6	1.1
12	Mutants	19	3.6	28	Allergic reactions	5	0.9
13	Seed technology	18	3.4	29	Anti-viral activity	5	0.9
14	Toxicity	18	3.4	30	Cell structure (physical & chemical properties)	5	0.9
15	Anti-oxidantal activity	15	2.8	31	Immunologic drug (Human)	4	0.8
16	Fertility / Anti-fertility effect	14	2.6	32	Taxanomy	3	0.6

The distribution of citations in Table 2 indicates an overlap between topics related to Medical Sciences, Chemistry, and Veterinary Sciences as well as between those related to Biological Sciences and Agriculture. To name a few examples: Anti-microbial agents, Medicinal properties, Fertility/Anti-fertility effect, Digestive system diseases treatment are shared by Medical Sciences and Veterinary Sciences; Plant growth and Tissue culture are shared by Biological Sciences and Agriculture; Metabolism is shared by Medical Sciences and Biological Sciences. This overlap bears out the inter-disciplinary nature of the literature of Nigella *sativa*. If these citations are merged into broader disciplines, in spite of overlap, Medical Sciences claim the largest share with 206 (38.9%) citations, with Chemistry receiving 116 (21.9%), followed by Agriculture with 98 (18.5%), Biological Sciences with 77 (14.5%), and Veterinary Sciences with 33 (6.2%).

Authorship Patterns

(a) Author Productivity

A total of 1,017 single or co-authors produced 529 publications (No author was named in one item), with a per citation mean of 1.92 authors. This figure shows that scholars who are active in this area tend to work in teams. Table 3 presents data on the number of publications produced by authors in this group.

Table 3: Number of Publications by Number of Authors

No. of Citations	No. of Authors	Percentage*
1	795	78.2
2	147	14.5
3	36	3.5
4	18	1.8
5	8	0.8
6	3	0.3
7	4	0.4
8	1	0.1
9	1	0.1
12	1	0.1
17	1	0.1
19	1	0.1
20	1	0.1

*The total reaches 100.1 due to rounding of figures.

A large majority of the authors (n=795, 78.2%) contributed only one item either singly or jointly. The remaining 222 (21.8%) authors contributed two or more items each. There are six authors who produced any where between eight and 20 items each.

(b) Core Authors

Twenty-one (2.1%) of the 1,017 authors contributed to 171 (32.3%) citations as compared to 795 (78.2%) individuals who authored only one citation each. These 21 scholars who contributed to between 5 and 20 citations each can be considered as the core writers on Nigella *sativa*. Their names and contributions are presented in Table 4. Out of the top 10 writers listed in Table 4, five come from India, two each from Egypt and Turkey, and one from Pakistan.

(c) Collaborative Authorship

Out of the 529 personal authored publications, 423 (80%) are the result of collaborative effort. The number of collaborating individuals varies from two to

eight. Table 5 provides the data on collaborative authorship. These data also show that the volume of collaborative publications has been increasing.

Table 4: Authors Who Contributed Five or More Citations

	Authors	No.of Citations
1	Biswas, A. K.	20
2	Datta, A. K.	19
3	Roy, S. C.	17
4	Chand, S	12
5	El-Dakhakhny, M. M.	9
6	Badary, Osama A.	8
7	Aksoy, H. A.	7
8	Atta-ur-Rahman	7
9	Dandik, S. M. L.	7
10	Gupta, S. C.	7
11	Aqel, M. B.	6
12	Pillai, A.	6
13	Sharma, A. K.	6
14	Alkofahi, A.	5
15	Al-Shabanah, O. A.	5
16	Bhowmick, G.	5
17	Crooks, P. A.	5
18	Ghosheh, O. A.	5
19	Medenica, R.	5
20	Nagi, M. N.	5
21	Peterson, C. M.	5

Table 5: Number of Collaborating Authors and Publications (n = 423)

No.of Authors	No. of Citations	Percentage
2	160	37.8
3	143	33.8
4	64	15.1
5	24	5.7
6	18*	4.3
7	12	2.8
8	2	0.5

*Includes one citation that names five authors with ‘et al.’

Table 6 presents data on periodic growth in collaborative activity in terms of both number of publications and number of collaborating authors. The figures show that collaborative activity, a norm in scientific research, started increasing from 1971 and became much more pronounced during the 1991-2000 period. Subbaiah (1984) reported a similar trend in the Indian grape research literature.

Table 6: Periodic Growth of Collaborative Activity

Period	No. of Authors by No. of Publications							
	2	3	4	5	6*	7	8	Total
1964-1965	1	1	0	0	0	0	0	2
1966-1970	3	0	0	0	0	0	0	3
1971-1975	8	11	1	0	0	0	0	20
1976-1980	21	12	2	0	0	0	0	35
1981-1985	25	11	7	2	0	1	0	46
1986-1990	17	11	6	2	0	0	0	36
1991-1995	23	28	16	5	5	5	2	84
1996-2000	58	65	29	13	11	5	0	181
2001	4	4	3	2	2	1	0	16
Total	160	143	64	24	18	12	2	423

* Includes one citation that names five authors with 'et al.'

(d) Author Affiliation

Institutional / organizational affiliation of researchers is indicative of the emphasis placed on research activity in certain locations. It was decided to use the affiliation of the first author for analysis because addresses of other authors are generally not available. Authors of 28 publications lacked institutional affiliation. These included book authors, authors with personal address, and first authors with no address. The remaining 502 citations, including dissertations, originated from 191 institutions located in 41 countries. The data for countries with four or more institutions are given in Table 7. India, Egypt, and U.S.A. have the largest number of institutions where research on Nigella *sativa* was conducted. However, if the volume of research activity was taken in terms of mean citations per institution, Saudi Arabia topped the list with 6.75, followed by Egypt with 5.90, and Pakistan with 3.29. Mean papers for Bangladesh with 2.80 are higher than those of India with 2.63. A total of 19 (34.1%) of the 41 countries fall in the developing nations category. They are home to 127 (66.5%) of the 191 institutions that produce 409 (81.5%) of the 502

publications. In other words, institutions in developing countries are more active in research on Nigella *sativa* as compared to those in advanced nations.

Table 7: Countries with Four or More Institutions

Name of Country		No. of Institutions	No. of Papers	Mean Papers per Institution	Rank by Mean Papers
1	India	59	155	2.63	5
2	Egypt	20	118	5.90	2
3	U. S. A.	18	32	1.78	8
4	Turkey	9	22	2.44	6
5	Germany	8	9	1.1	9
6	U. K.	8	9	1.1	9
7	Pakistan	7	23	3.29	3
8	Japan	6	11	1.83	7
9	Bangladesh	5	14	2.80	4
10	Saudi Arabia	4	27	6.75	1

Which institutions among the 191 where research on Nigella *sativa* was done were more active than others? The active institutions that produced six or more papers are listed in Table 8. Among the 18 institutions listed in Table 8, six are based in Egypt, five in India, two each in Jordan, Pakistan, and Saudi Arabia, and one in Turkey. Interestingly, all of these top 18 institutions are located in developing countries.

Table 8: Institutions That Produced Six or More Citations

Name of Institution		No. of Papers	Name of Country
1	University of Calcutta	25	India
2	University of Kalyani	24	India
3	Alexandria University	23	Egypt
4	National Research Center	18	Egypt
5	King Saud University	16	Saudi Arabia
6	Cairo University	15	Egypt
7	Bose Institute	14	India
8	Assiut University	10	Egypt
9	University of Agriculture (Faisalabad)	10	Pakistan
10	Zagazig University	9	Egypt
11	University of Science & Technology	9	Jordan
12	Istanbul Technical University	9	Turkey
13	University of Rajasthan	7	India
14	University of Karachi	7	Pakistan
15	Kakatiya University	6	India
16	University of Jordan	6	Jordan
17	King Faisal Specialist Hospital	6	Saudi Arabia

18	Ain Shams University	6	Egypt

Source Journals

(a) Subject Dispersion of Journals

Out of the 530 publications, 471 are articles that come from 261 journals originating from a variety of disciplines. The subject dispersion of these journals is given in Table 9. Subject dispersion of journals presented in Table 9 shows the scatter and inter-disciplinary nature of the literature on Nigella *sativa*. The largest number of journals comes from Medical Sciences, closely followed by Biological Sciences. Presence of two journals from Paleontology indicates an interest in the use of Nigella *sativa* by the ancient civilizations.

Table 9: Subject Dispersion of Journals

Subject Area		No. of Journals	Percentage*
1	Medical Sciences	78	29.9
2	Biological Sciences	68	26.1
3	Agriculture and Forestry	37	14.2
4	Chemistry	21	8.0
5	Veterinary Sciences	18	6.9
6	General Science / non-science	14	5.4
7	Food Industry	11	4.2
8	Engineering and Technology	6	2.3
9	Environmental Studies	5	1.9
10	Paleontology	2	0.8
11	Physics	1	0.4
	Total	261	100.1

*Total reaches 100.1 due to rounding of figures.

(b) Number of Papers Published by These Journals

It was reported in the previous section that 471 papers were published by 261 journals. The data on the number of papers produced by each of these journals are presented in Table 10. The figures show that a little less than two-thirds (n=164, 62.8%) of the 261 journals, by publishing only one paper each, produced a little more than one-third (34.8%) of the 471 papers. The remaining 97 (37.2%) journals together published 65.2% of all papers. Thirty-six (13.8%) journals together produced 185 (39.3%) of the papers. These 36 journals can be regarded as the core

journals for the literature on Nigella *sativa*. The journal titles that published five or more papers each are presented in Table 11.

Table 10: Number of Papers by Number of Journals

No.of Papers	No.of Journals	Total Papers
1	164	164
2	61	122
3	10	30
4	10	40
5	7	35
6	1	6
7	3	21
8	1	8
9	1	9
10	1	10
12	1	12
14	1	14

Table 11: Journals Publishing Five or More Papers

Title of the Journal	Country of Origin	Number of Papers	Rank
Journal of Ethno-Pharmacology	Ireland	14	1
Fitoterapia	Hungary	12	2
Indian Journal of Experimental Biology	India	10	3
Cytologia	Japan	9	4
Hamdard Medicus	Pakistan	8	5
Cell and Chromosome Research	India	7	6
Egyptian Journal of Nutrition and feeds	Egypt	7	6
Phytotherapy Research	U. K.	7	6
Assiut Veterinary Medical Journal	Egypt	6	7
American Journal of Botany	U. S. A.	5	8
Annals of Agricultural Science (Moshtohor)	Egypt	5	8
Experientia (Basel)	Switzerland	5	8
Indian Sugar	India	5	8
Journal of the American Oil Chemists' Society	U. S. A.	5	8
Planta Medica	Germany	5	8
Saudi Pharmaceutical Journal	Saudi Arabia	5	8

These 16 journals together published 115 papers that come to 24.4% of all papers. Egypt and India each publish three of these journals.

(c) Geographic Origin of the Journals

These 261 journals originate from 39 countries varying in number from 55 titles to one. The geographic distribution of journals and the number of papers published by these is given in Table 12. Among the top five producers of both journals and papers, Egypt has higher mean papers per journal than the other four. In general, the number of mean papers per journal is higher for the countries that publish less number of journals, e.g., Hungary and Ireland.

Table 12: Geographic Origin of Journals

No.	Name of Country	No. of Journals	No. of Papers	Mean Papers Per Journal
1	India	55	99	1.8
2	Egypt	37	75	2.0
3	U. S. A.	28	43	1.5
4	U. K.	25	42	1.7
5	Germany	23	38	1.7
6	Netherlands	12	19	1.6
7	Japan	10	20	2.0
8	Pakistan	8	18	2.3
9	France	7	12	1.7
10	Poland	6	7	1.2
11	Bangladesh	4	7	1.8
12	Ireland	3	17	5.7
13	Denmark	3	6	2.0
14	Romania	3	4	1.3
15	Russia	3	3	1.0
16	Turkey	3	4	1.3
17	Australia	2	2	1.0
18	Austria	2	3	1.5
19	Belgium	2	2	1.0
20	Greece	2	2	1.0
21	Hungary	2	13	6.5
22	Italy	2	3	1.5
23	Saudi Arabia	2	6	3.0
24	Switzerland	2	6	3.6
25	Canada	1	1	1.0
26	China	1	1	1.0
27	Croatia	1	1	1.0
28	Ethiopia	1	1	1.0
29	Finland	1	1	1.0

30	Iran	1	1	1.0
31	Iraq	1	2	2.0
32	Jordan	1	2	2.0
33	Lithuania	1	2	2.0
34	Malaysia	1	2	2.0
35	Philippines	1	1	1.0
36	Slovakia	1	1	1.0
37	Sri Lanka	1	1	1.0
38	Sudan	1	1	1.0
39	Taiwan	1	2	2.0
	All	261	471	1.8

The distribution of journals and papers by region is given in Table 13. Europe and Asia, combined together, lead all other regions in publishing a greater number (73.2%) of the journals and a larger number (73.8%) of the papers. The proportion of journals and papers in all regions is very close to each other.

Table 13: Regional Distribution of Journals and Papers

Region	No. of Countries	No. of Journals (%)	No. of Citations (%)*
Europe	19	101 (38.7)	182 (38.6)
Asia	14	90 (34.5)	166 (35.2)
Africa	3	39 (14.9)	77 (16.3)
North America	2	29 (11.1)	44 (9.3)
Australia	1	2 (0.8)	2 (0.4)
Total	39	261 (100)	471 (99.8)

*Total reaches 99.8 due to rounding of figures.

Format of Publications

Data on the format of 530 publications on Nigella *sativa* are presented in Table 14. Papers published in journals completely dominate the literature of Nigella *sativa*. Adenaike (1982) and Subbaiah (1984) reported similar findings for literature on cowpea and grapes. It is interesting to note that with all of this research, the number of patents listed is only seven. This trend needs to be examined. It may be interesting to look at the distribution of 18 dissertations by country of origin. Egypt leads all nations in dissertation-based research on Nigella *sativa*. A researcher from India wrote one of the two dissertations originating from the USA. It seems that the scholars from Africa and Asia who have conducted all dissertation-based research, prefer to study in their own country. Table 15 lists the country where these dissertations were completed.

Table 14: Format of Publications

Format	Frequency	Percentage
Journal Articles	471	88.9
Conference Papers	29	5.5
Dissertations	18	3.4
Patents	7	1.3
Books & Book Parts	5	0.9
Total	530	100

Table 15: Dissertations by Country

Country	Number of Dissertations	Percentage
Egypt	10	55.6
Pakistan	3	16.7
USA.	2	11.1
Lebanon	1	5.6
Sudan	1	5.6
Turkey	1	5.6

Language Dispersion

Out of the 530 publications, 517 (97.5%) are in English whereas only 13 (2.5%) are in five other European languages. Six publications are in German, three in French, two in Russian, and one each in Polish and Romanian. It may be noted that 87% of the literature on cowpea was produced in English (Adenaike, 1982). An interesting finding is that none of these publications is in any of the Asian or African languages. Therefore, English is the language of scholarship on Nigella *sativa*.

Geographic Origin of All Publications

What is the geographical origin of all 530 publications? Three of the citations are for international patents. The remaining 527 publications originate from 40 countries varying in number from 102 items for India to only one for several countries. Their distribution by country is given in Table 16. Five (12.5%) countries, topped by India and Egypt, provide 65.1% of the total literature. Eleven (27.5%) countries

produce 84.6% of the literature. On the lower side, 18 (45.0%) countries provide only 26 (4.9%) of the 527 publications.

Table 16: Geographic Origin of All Publications (n = 527)

Name of Country		No.of Publications	Name of Country		No.of Publications
1	India	102	21	Austria	3
2	Egypt	94	22	Italy	3
3	U. S. A.	60	23	Belgium	2
4	U. K.	47	24	Greece	2
5	Germany	40	25	Iraq	2
6	Netherlands	19	26	Jordan	2
7	Japan	20	27	Lithuania	2
8	Pakistan	21	28	Malaysia	2
9	Ireland	17	29	Sudan	2
10	France	13	30	Taiwan	2
11	Hungary	13	31	Canada	1
12	Bangladesh	7	32	China	1
13	Poland	7	33	Croatia	1
14	Denmark	6	34	Ethiopia	1
15	Saudi Arabia	6	35	Finland	1
16	Switzerland	6	36	Iran	1
17	Turkey	6	37	Lebanon	1
18	Romania	4	38	Philippines	1
19	Russia	4	39	Slovakia	1
20	Australia	3	40	Sri Lanka	1

CONCLUSION

The growth of the literature analyzed in this study indicates that research on Nigella *sativa* will continue to grow in the future. The findings confirm that the literature on this plant is of interdisciplinary nature. There is a focus in research on identifying active components in the seeds of Nigella *sativa* for various purposes, especially in Medical Sciences and Chemistry. This literature is mostly the result of team effort that has been increasing over time. Twenty-one writers emerge as the core authors. More institution-based research in conducted in developing countries and the top 18 research producing institutions are located in Asia and Africa. Sixteen of the 261 journals that publish from five to 14 papers each are the core group for this literature. Europe and Asia produce about two-thirds of all journals. Journal articles

and English language are the dominant characteristics of this literature. A small number of countries produce a larger part of this literature.

ACKNOWLEDGEMENT

The Kuwait University Research Administration is gratefully thanked for supporting this study financially. The author appreciates Nibal Ahmed Yousef for her assistance in literature searching and preparing the Procite database.

NOTE

An e-mail message was sent to the Director of the Ferdinand Postma Library, Potchefstroom University (South Africa) inquiring about the availability of this publication. No reply was received.

REFERENCES

Adenaike, Babs O. 1982. Bibliometric studies on a protein-rich crop: The cowpea. *Journal of Information Science*, Vol. 4 no. 2-3: 117-121.

Akerele, Olayiwola 1991.Medicinal plants: policies and priorities, In: *The Conservation of Medicinal Plants: Proceedings of an International Consultation*, 21-27 March 1988 held at Ching Mai, Thailand. Cambridge: Cambridge University Press: 3-11.

Anwar, Mumtaz A. 2001. Muslims and Europe: A demographic study of citations from the Index Islamicus database. *Malaysian Journal of Library & Information Science*, Vol. 6 no. 1: 93-104.

Bierbaum, E.G., Brooks, T.A.; Brooks, R.M. 1992. Subject control of the literature of Acquired Immunodeficiency Syndrome (AIDS). *Information Processing & Management*, Vol. 28 no. 1: 89-98.

Chadwick, A.F., Craker, L.E. 1988. The scientific literature on herbs. *Science and Technology Libraries*, Vol. 9 no. 1: 71-103.

Dhiman, A.K. & Sinha, S.C. 2001. Impact of research collaboration on growth of literature in ethnobotany: A bibliometric study. *SRELS – Journal of Information Management*, Vol. 38 no. 1: 53-62.

Fan, W. 2001. The Traditional Chinese Medical Literature analysis and Retrieval system (TCMLARS) and its application. *Inspel*, Vol. 35 no. 3: 147-156.

Gerritsma, L.M. 1989. *Literature Review: Nigella sativa*. Cape Town: Department of Pharmaceutical Chemistry, Potchefstroom University.

Haiqi, Z. 1994. A bibliometric study on medicine Chinese traditional [sic] in Medline database. *Scientometrics*, Vol. 31 no. 3: 241-250.

Meera. 1998. Plant ecology literature: A bibliometric study. *International Information Communication and Education*, Vol. 17 no. 1: 41-59.

Paisley, W. 1990. The future of bibliometrics, In: Borgman, C. L. ed. *Scholarly Communication and Bibliometrics*. Newbury Park: Sage Publications: 281-299.

Ramakrishna, N.V. & Pangannaya, N. B. 1999. Growth of biotechnology literature: A bibliometric study. *Information Studies*, Vol. 5 no. 1: 25-38.

Ruiz, T.T. 1988. Selection of bibliographic reviews of phytopharmaceutical interest v. Ranunclales. Ediciones Universidad de Salamanca: Studia Botanica, Vol. 7:263-266.

Sengupta, I.N. 1992. Bibliometrics, informetrics, scientometrics and librametrics: An overview. *Libri*, Vol. 42 no. 2: 75-98.

Sheriff, P.A. 1999. Spices bibliography – 1998 (part 1). *Journal of Spices and Aromatic Crops*, Vol. 8 no.1: 101-130.

Subbaiah, R. 1984. Eighty years of grape research in India (1901-1981): A bibliometric study. *Annals of Library Science and Documentation*, Vol. 31 no. 1-2: 18-26.

Zus'man, O.M. 2000. Nauchnye sotrudniki kak potrebiteli rezul'tatov bibliometricheskikh (naulometricheskikh) [Scientists as users of the results of bibliometric (scientometric) studies]. *Nauchno-Tekhnicheskaya Informatsiya Series 1*, No. 3: 11-17.