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Research output on Lavender, 2008–2012

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ABSTRACT

Introduction: This study evaluates the global scientific output and observes the patterns in the scholarly literature published on Lavender over a period of five years (2008 through 2012).
Methods: The study is based on the bibliometric analysis of the data collected from two leading indexing and abstracting databases—Thomson Reuter's *Web of Science* and Elsevier's *SciVerse Scopus*.
Results: Based on the number of publications during the study period no consistent growth is observed in the research activities pertaining to Lavender. An apparent difference in the research output has been observed between the developed and developing countries. Most of the articles are published in journals from United States, United Kingdom, Netherlands and Germany. Authors have mostly worked in a team of three and have preferred to work with authors from their respective institutions. Authors from over 60 different nations are found to be working on the subject; however, most of them are from Iran, Spain and Portugal. '*Lavandula angustifolia*', '*Lavandula stoechas*', and '*Lavandula* × *intermedia*' are most extensively studied species. English as a language of publication has remained a prime medium of communication for authors.
Conclusion: While growth of literature in this field has not been consistent, continued research interest in Lavender has been revealed by this study. Research activity is apparent in a wide range of countries but there is potential for greater international collaboration. The outcomes of research are also widely scattered across numerous journals reflecting the diversity in research being conducted. While the focus has been on a limited number of species of lavender, the large number of available species that have received limited research interest could provide a focus for future research.

1. Introduction

Lavender, a fragrant herb is a genus of 39 species [1] of flowering plant in the Mint family (scientifically known as Lamiaceae). The name lavender comes from the Latin root *lavare*, which means *to wash*. The Latin name Lavandula comes from the ancient use of this plant to perfume the water for bathing [1–4]. Lavender may have earned this name because it was frequently used in baths to help purify the body and spirit. However, this herb has also been used as a remedy for a range of ailments from insomnia and anxiety to depression and fatigue, digestive complaints including meteorism (abdominal swelling from gas in the intestinal or peritoneal cavity), loss of appetite, vomiting, nausea, intestinal gas (flatulence), and upset stomach, migraine headaches, toothaches, sprains, nerve pain, sores, and joint pain. Lavender retains both commercial and medicinal value. Its oil is used for different purposes i.e. as fragrance, aromatherapy, used to treat different types of cancers and acne, and to promote menstruation [1,5].

Research has been carried on Lavender by scientists from different corners of the world resulting in a varied research output in the field of Lavender. To evaluate research output on Lavender, bibliometrics—a quantitative analysis [6], help in the quantification and measurement of the published knowledge can be used to reveal publication trends on the topic Lavender. Bibliometrics throws light on the pattern of growth of literature, interrelationship among different branches of knowledge, productivity, authorship pattern, degree of collaboration, pattern of collection building and their use [7]. Even Pritchard, who coined the term bibliometrics comments on it as all studies which seek to quantify processes of written communication [8].

Bibliometric methods are most often used in the field of Information Science, but they also have wide applications in other

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areas. They utilize quantitative analysis and statistics to describe patterns of publication within a given field or body of literature. There has been a wide range of interpretations of bibliometrics that have been put forward by many experts over the years [9–16].

2. Purpose and importance of the study

Lavandula a flowering plant has remained the topic of interest from the times people begun to use it for ornamental and medicinal purposes. Researchers' around the globe have studied it from various perspectives and have communicated their findings through various sources of information. This study is undertaken to provide an insight into the contemporary engagement of scholars with various facets of Lavandula by means of different research output assessment efforts. The paper maps Lavender research published across the globe as reflected through *Web of Science* and *SciVerse Scopus*.

Research evaluation is certainly not a new activity. Assessments of research performance by review committees, funding councils, individual peers and references have a long tradition even if the terminology applied is different [17]. For various stake holders, bibliometrics can help in monitoring the development and recognizing trends and changing pattern in the field. For scholars, it provides information on authors who are actively engaged with the subject and the journals where researchers report their findings. It also highlights the species of Lavandula that have been extensively studied and those which are yet to be explored.

3. Objectives

The objectives of the study were:

- To determine annual publication trends
- To identify different types of sources used and the types of publications
- To identify the core publications and the country of publications
- To reveal the authorship pattern, collaboration type and author productivity
- To specify the language priority

4. Methodology

Thomson Reuter's *Web of Science (WoS)* and Elsevier's *SciVerse Scopus* databases were consulted as the data source for the study. They were chosen primarily because of their exhaustive coverage of most reliable and authentic sources, in addition to, representing two leading general indexing and abstracting sources [18–23]. Lavandula the scientific name for Lavender, was used as a term to run the searches at both databases. At *SciVerse Scopus,* the search was confined to three indexing fields: *title, abstract, and keyword* and at *WoS*; it was restricted to two fields: *topic and title*. The search was further confined to a period of five year, i.e, 2008 through 2012. With this exercise; *SciVerse Scopus* retrieved 573 records and *WoS* listed 322 records. Since the indexed content of *WoS* and *SciVerse Scopus* are not mutually exclusive; an overlapping of the records was evident. After elimination of duplicate records; a total of 628 records remained. Of these 266 records were indexed by both database; 306 records were found in *SciVerse Scopus* only while 56 were unique to *WoS*.

After identification, necessary bibliographical details for each record were downloaded and recorded in MS-Excel. To enrich the data further, *SCImago* database was consulted to determine the place of publication of sources in which authors publish their findings. Further, to categorize authors' country of affiliation under different economic zones, the *World Bank Classification Scheme* was employed.

5. Findings

5.1. Yearly distribution

A total of 628 articles were retrieved for the period 2008–2012 but there may be other articles that are not listed either on *SciVerse Scopus* or *Web of Science* or that were not retrieved. As evident from Table 1, there is no uniformity in the growth of literature, though compound annual growth rate of 6.89 percent is observed during the study period. It is only in 2010 and 2011, one can witness some positive growth while a dip is observed in 2009 and 2012. Inconsistency in relative growth rate (RGR) and the increase in doubling time (Dt) is a clear indication that the growth is neither exponential.

5.2. Publication type

Authors have mostly reported their findings in the form of *research articles* as they constitute 85.67 percent of total records. 4.62 percent records are *review articles* while 3.18 percent are *meeting abstracts* and *conference proceedings*. Two *short surveys,* two *editorials* and a single *news item* are also published on the studied subject (Table 2). The findings also confirm an earlier study in the homeopathic literature which revealed that the paper article is the most frequently used document type, followed by letters, editorial materials, reviews, news items, notes, meeting abstracts, book reviews, biographical items and corrections [28].

Table 2
Publication type.

Type	No. of publications	Percentage
Research Articles	544	86.62
Review Articles	29	4.62
Meeting Abstracts	20	3.18
Conference Papers	20	3.18
Notes	10	1.59
Short Surveys	2	0.32
Editorial	2	0.32
News Item	1	0.16

Table 1
Yearly distribution of publications.

Year	No. of publications	Growth rate	Compound annual growth rate	Relative growth rate*	*Doubling time**
2008	108	–	6.89%	–	–
2009	96	−11.11%		0.64	1.09
2010	135	40.63%		0.51	1.36
2011	148	9.63%		0.36	1.91
2012	141	−4.96%		0.25	2.73

* RGR is a measure to study the increase in number of articles of time and the Dt is directly related to RGR. Dt is the period of time required for a quantity to double in size or value.

5.3. Sources used

Publications on Lavandula are found to be highly scattered in the literature. Authors have made use of 379 different sources to publish their work and amongst these nearly 75 percent of sources (285) publish only one article each while 11.61 percent of sources report two articles each. As evident from Table 3, there are only 13 source titles that had published more than 5 publications each. With cumulative sum of 120 publications, they together published 19.11 percent of total publications. One could find a maximum of 15 papers that were published in *Planta Medica*, and 14 papers each in *Acta Horticulturae* and *Natural Product Communication*.

5.4. Country of publication

Though there are more than 190 countries registered at United Nations, publishers from only 49 countries were found to manage sources that publish content on Lavandula. Amongst these, most of the publishers operate from United States, followed respectively by United Kingdom and Netherlands. On the other extreme, publishers from 17 countries manage only one source each that publish content on Lavandula. As evident from Table 4, nearly 66 percent of source titles are managed by the publishers from top 5 countries that publish nearly 66 percent of works on Lavandula.

5.5. Authorship pattern

Team efforts are found to be the driving force to work on the subject as 93.47 percent of publications are produced in collaboration, while individual efforts account to only 6.53 percent of the total. Predominance of multiple authorship has also been observed in the fields of AIDS [24], Fiber Optics [25], Psychology [32], Agriculture [44] and Service innovation [45] while in the fields of Homeopathy [26] and Embelia ribes [29] authors have preferred to work at individual levels. From Table 5, it is clear that authors have worked in the largest group of 14. However, maximum output is observed in the team strength of three (128, 20.38%), followed by group of two (104, 16.56%) and four (102, 16.24%) respectively.

Over the years, an increase has been observed in authors' tendency to work in collaboration, i.e, authorship strength of papers was found to increase with the passage of time. This has been confirmed from *Mann–Whitney Test* where authorship pattern was analyzed in the works published in 2008 and 2012 (two extreme data points in the study). As evident from Table 6, statistically significant difference ($p < 0.05$, $Z = -2.219$) is observed in the mean rank of authorship strength with works published in 2012 having higher mean rank (133.77) than works published in 2008 (mean rank = 113.55)

5.6. Research Collaboration

Collaboration was studied under three headings: *International* (authors belonging to different countries); *National* (authors belonging to the same country but from different institutions); and *Institutional* (all authors are from same institution). From Fig. 1, it is clear that authors mostly tend to collaborate with their colleagues working within their institutions, as 91.48 percent team works (537 publications) show institutional collaboration. National collaborative work amounted to 49.91 percent (293) while international collaboration was seen in 17.55% of work (103).

There may be instances where collaborating authors represent a spectrum of institutions with different departmental affiliations. As such, one may find different types of collaborations in the same paper. From Fig. 1 it is evident that 7 different types of collaborations exist. A maximum of 240 publications (38.22%) are result of *institutional collaboration* only, followed by 213 publications (33.92%) in which both *national* and *institutional collaborations* are found. There are only 41 publications (6.53%) in which all forms of collaborations are found, i.e., *international, national and institutional*. Dominance of national collaboration has been demonstrated in the field of Psychology [32] while international collaboration has been found dominant in Biochemistry and Molecular Biology research in China [27], Obstructive Sleep apnea [30], microRNA research [33], Physical [34] and Dental Science research in India [36], Nanoscience and Nanotechnology research in Pakistan [35], and in a no. of other studies [37,48–51].

5.7. Author productivity

A total of 2248 authors had contributed to the literature on lavender. However, the majority (86.88 percent) had published only one work, 9.7 percent authors had published two papers each while 2.09 percent published three papers each. Only 30 authors had published more than three publications each. The ranked list of

Table 3
Sources used.

S.No.	Source publication	No of papers	Percentage
1	Planta Medica	15	2.39
2	Acta Horticulturae	14	2.23
3	Natural Product Communications	14	2.23
4	Molecules	10	1.59
5	Food Chemistry	9	1.43
6	Journal of Essential Oil-Bearing Plants	8	1.27
7	Journal of Ethnopharmacology	8	1.27
8	Journal of Medicinal Plants	8	1.27
9	Journal of Medicinal Plants Research	8	1.27
10	Flavour and Fragrance Journal	7	1.11
11	Journal of Chromatography A	7	1.11
12	Journal of Essential Oil Research	6	0.96
13	Natural Product Research	6	0.96
	7 sources published five publication each	35	5.57
	10 sources published four publication each	40	6.37
	20 sources published three publication each	60	9.55
	44 sources published two publication each	88	14.01
	285 sources published single publication each	285	45.38

Table 4
Top 10 Countries of publication.

Rank	Country	No. of sources $N = 379$	Total papers $N = 628$	Rank	Country	No. of sources $N = 379$	Total papers $N = 628$
1	United States	80 (21.11%)	134 (21.34%)	12	Ireland	2 (0.53%)	10 (1.59%)
2	United Kingdom	68 (17.94%)	116 (18.47%)	12	Mexico	2 (0.53%)	2 (0.32%)
3	Netherlands	53 (13.98%)	68 (10.83%)	12	New Zealand	2 (0.53%)	2 (0.32%)
4	Germany	32 (8.44%)	66 (10.51%)	12	Russian Federation	2 (0.53%)	2 (0.32%)
5	India	16 (4.22%)	27 (4.3%)	12	Serbia	2 (0.53%)	4 (0.64%)
6	Japan	10 (2.64%)	10 (1.59%)	12	Singapore	2 (0.53%)	2 (0.32%)
7	Poland	8 (2.11%)	12 (1.91%)	12	South Korea	2 (0.53%)	4 (0.64%)
7	Romania	8 (2.11%)	13 (2.07%)	13	Australia	1 (0.26%)	1 (0.16%)
8	France	7 (1.85%)	9 (1.43%)	13	Belgium	1 (0.26%)	14 (2.23%)
8	Turkey	7 (1.85%)	10 (1.59%)	13	Chile	1 (0.26%)	1 (0.16%)
9	Brazil	6 (1.58%)	11 (1.75%)	13	Czech republic	1 (0.26%)	1 (0.16%)
9	Pakistan	6 (1.58%)	13 (2.07%)	13	Egypt	1 (0.26%)	1 (0.16%)
10	China	4 (1.06%)	4 (0.64%)	13	Finland	1 (0.26%)	2 (0.32%)
10	Croatia	4 (1.06%)	4 (0.64%)	13	Greece	1 (0.26%)	1 (0.16%)
10	Italy	4 (1.06%)	6 (0.96%)	13	Israel	1 (0.26%)	1 (0.16%)
10	Nigeria	4 (1.06%)	11 (1.75%)	13	Kenya	1 (0.26%)	5 (0.8%)
10	Spain	4 (1.06%)	5 (0.8%)	13	Latvia	1 (0.26%)	2 (0.32%)
11	Austria	3 (0.79%)	3 (0.48%)	13	Morocco	1 (0.26%)	1 (0.16%)
11	Hungary	3 (0.79%)	3 (0.48%)	13	Philippines	1 (0.26%)	1 (0.16%)
11	Iran	3 (0.79%)	10 (1.59%)	13	South Africa	1 (0.26%)	1 (0.16%)
11	Jordan	3 (0.79%)	4 (0.64%)	13	Sweden	1 (0.26%)	1 (0.16%)
12	Bulgaria	2 (0.53%)	3 (0.48%)	13	Switzerland	1 (0.26%)	10 (1.59%)
12	Canada	2 (0.53%)	2 (0.32%)	13	Thailand	1 (0.26%)	1 (0.16%)
12	Denmark	2 (0.53%)	2 (0.32%)	13	Venezuela	1 (0.26%)	1 (0.16%)
12	Ireland	2 (0.53%)	10 (1.59%)		Unknown*	9 (2.37%)	11 (1.75%)

*Country of publication of 9 sources could not be ascertained and as such tagged under unknown category.

Table 5
Authorship pattern.

Authorship	Papers	Percentage	Authorship	Papers	Percentage
1	41	6.53	8	24	3.82
2	104	16.56	9	15	2.39
3	128	20.38	10	4	0.64
4	102	16.24	11	4	0.64
5	89	14.17	12	2	0.32
6	72	11.46	13	1	0.16
7	41	6.53	14	1	0.16
Total				628	100

prolific authors (contribution ≥4 papers) along with their country of affiliation is depicted in Table 7.

5.8. Author's Country of affiliation

Authors from 64 countries were involved with the research activities on Lavandula. As evident from Table 8, Iran has highest number of authors (178), followed respectively by 165 Spanish authors and 142 Portuguese authors. Around 54 percent of authors are from top 10 countries and the remaining 46 percent of authors are scattered among 54 countries.

5.9. Author: economic zone

When the authors were viewed according to the economic status of their affiliating countries, as delineated by World Bank; the majority of authors (57.83%) belong to *High Income* countries, followed by 35.36% from *Upper Middle Income* countries. Only one country (Nepal) is found to be active amongst *Low Income* countries.

Regarding the participation of different countries from their respective zone, maximum countries are found to be from *Upper Middle Income zone* (61.11%), followed by countries from *High Income zone* (Table 9).

5.10. Species

The most researched species is '*Lavandula angustifolia*' which has been researched in 441 publications, followed by '*Lavandula stoechas*' (75 publication), '*Lavandula* × *intermedia*' (29 publications), '*Lavandula Latifola*' (24 publications) and '*Lavandula dantata*' (24 publications) respectively.

5.11. Language of publication

Authors have preferred unilingual sources to communicate their work as there were only twenty papers published in sources

Table 6
Mann–Whitney test for authorship strength of works published in 2008 and 2010.

Ranks				Test statistics[a]	
Year of publication	No. of publications	Mean rank	Sum of ranks		Authorship strength
2008	108	113.55	12263.50	Mann–Whitney *U*	6377.500
2012	141	133.77	18861.50	Wilcoxon W	12263.500
Total	249			Z	-2.219
				Asymp. Sig. (2-tailed)	.026

[a] Grouping variable: year of publication.

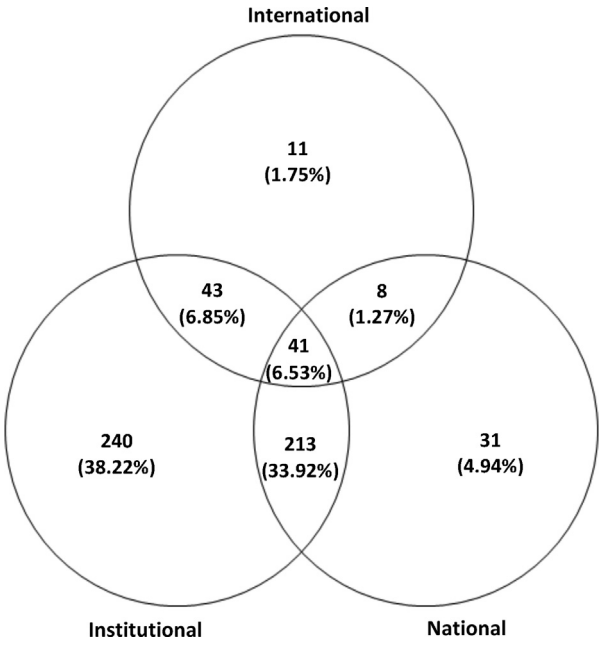

Fig. 1. Anatomy of collaboration.

that offered content in two languages while the remaining 608 papers were reported in sources that publish content in one language only. In all, publications included in this study were written in 18 languages. As evident from Table 10, authors have predominately preferred English over other languages to communicate their findings as 93.2 percent of publications are available in English. English as a dominant language in the research world has also been acknowledged through number of studies [38,39–43].

6. Discussion

The bibliometric analysis of Lavender has shown an inconsistent growth of literature during the study period. Considering medicinal and ornamental values of Lavender, there is need to encourage researchers to enter in this field, provided they are equipped with better facilities.

Authors have mainly preferred journals over books and conferences proceedings to publish their work. However, due to the literature on Lavender being very scattered, one could not delineate core sources where people can find exhaustive literature on the studied subject. It is worth noting that India being the developing nation ranks 5th in the country of source publication list and 11th in the author-affiliation country list which is evidence for the fact that even developing nations are progressing in the research field of Lavender. Most sources list the Mediterranean area-Greece, France and the North African Coast as the native habitat of Lavender, but several botanists think that India also may have been part of the native range [2]. This could be the possible reason for the research interest in India.

Among the G7 countries, 6 countries (U.S, U.K, Germany, Japan, France and Italy) are among the top 10 in terms of source publications for authors. The G7 countries are considered the wealthiest developed nations in the world [52] which could explain why many publishers are based in these countries. Orientation of scientists towards collaborative rather than

Table 8
Ranked distribution of authors as per their country of affiliation.

Rank	Author	No. of authors	Rank	Author	No. of authors
1	Iran	178 (7.92%)	27	Switzerland	12 (0.53%)
2	Spain	165 (7.34%)	27	Saudi Arabia	12 (0.53%)
3	Portugal	142 (6.32%)	27	Mexico	12 (0.53%)
4	Japan	139 (6.18%)	27	Czech republic	12 (0.53%)
5	USA	136 (6.05%)	28	Russia	9 (0.40%)
6	Turkey	115 (5.12%)	28	Chile	9 (0.40%)
7	Italy	102 (4.54%)	28	Austria	9 (0.40%)
8	France	91 (4.05%)	29	South Africa	8 (0.36%)
9	South Korea	77 (3.43%)	29	Egypt	8 (0.36%)
10	United Kingdom	71 (3.16%)	30	Yemen	5 (0.22%)
11	India	68 (3.02%)	30	Sweden	5 (0.22%)
11	Brazil	68 (3.02%)	30	Netherlands	5 (0.22%)
12	Romania	67 (2.98%)	30	Finland	5 (0.22%)
13	China	66 (2.94%)	31	Uruguay	4 (0.18%)
14	Germany	62 (2.76%)	31	New Zealand	4 (0.18%)
15	Poland	56 (2.49%)	31	Belgium	4 (0.18%)
16	Greece	52 (2.31%)	32	Slovenia	3 (0.13%)
17	Morocco	46 (2.05%)	32	Lithuania	3 (0.13%)
18	Canada	44 (1.96%)	33	Peru	2 (0.09%)
19	Australia	43 (1.91%)	33	Norway	2 (0.09%)
20	Serbia	35 (1.56%)	33	Ireland	2 (0.09%)
20	Hungary	35 (1.56%)	34	Venezuela	1 (0.04%)
21	Tunisia	32 (1.42%)	34	Vietnam	1 (0.04%)
21	Taiwan	32 (1.42%)	34	Senegal	1 (0.04%)
21	Croatia	32 (1.42%)	34	Puerto Rico	1 (0.04%)
22	Bulgaria	26 (1.16%)	34	Philippines	1 (0.04%)
23	Jordan	25 (1.11%)	34	Nepal	1 (0.04%)
23	Algeria	25 (1.11%)	34	Denmark	1 (0.04%)
24	Pakistan	20 (0.89%)	34	Cyprus	1 (0.04%)
24	Israel	20 (0.89%)	34	Colombia	1 (0.04%)
25	Thailand	18 (0.80%)	34	Cameroon	1 (0.04%)
26	Argentina	14 (0.62%)	34	Armenia	1 (0.04%)

Table 7
Prolific authors'contribution.

Rank	Author	Country of affiliation	No. of papers	Rank	Author	Country of affiliation	No. of papers
1	Mahmoud, S.S	Canada	8	3	Cocero, M.J	Spain	5
1	Cavaleiro, C	Portugal	8	4	Blazekovic, B	Croatia	4
2	Zuzarte, M	Portugal	6	4	Gonçalves, S	Portugal	4
2	Biasi, L.A	Brazil	6	4	Pavela, R	Czech republic	4
2	Deschamps, C	Brazil	6	4	Herrera, C.M	Spain	4
2	Vladimir-Kneevic, S	Croatia	6	4	Conti, B	Italy	4
2	Salgueiro, L	Portugal	6	4	Chograni, H	Tunisia	4
3	Easton, C.D	Australia	5	4	Baydar, H	Turkey	4
3	Robu, S	Romania	5	4	Vokou, D	Greece	4
3	Jacob, M.V	Australia	5	4	Rezazadeh, Sh	Iran	4
3	Kalemba, D	Poland	5	4	Canale, A	Italy	4
3	Barroso, J.G	Portugal	5	4	Martín, A	Spain	4
3	Canhoto, J	Portugal	5	4	Varona, S	Spain	4
3	Gonçalves, M.J	Portugal	5	4	Boussaid, M	Tunisia	4
3	Romano, A	Portugal	5	4	Soylu, S	Turkey	4

Table 9
Distribution of authors as per economic status of their affiliating countries.

Economic zone	Total countries in zone	No. of contributing countries	No. of authors
High Income	70	31 (44.28%)	1300 (57.83%)
Upper Middle Income	36	22 (61.11%)	795 (35.36%)
Lower Middle Income	54	10 (18.52%)	152 (6.76%)
Low Income	54	1 (1.85%)	1 (0.04%)

Table 10
Language of publications.

Language	No. of publications	Language	No. of publications
English	585 (93.2%)	Chinese	3 (0.48%)
Portuguese	10 (1.6%)	Persian	3 (0.48%)
French	8 (1.3%)	Croatian	2 (0.32%)
German	7 (1.1%)	Japanese	2 (0.32%)
Spanish	6 (1%)	Romanian	2 (0.32%)
Turkish	6 (1%)	Serbian	2 (0.32%)
Korean	4 (0.6%)	Czech	1 (0.16%)
Polish	4 (0.6%)	Hungarian	1 (0.16%)
Arabic	3 (0.5%)	Thai	1 (0.16%)

individualistic research has been highlighted in a number of studies [27,30,31,37,46,47,50,53,54].

Institutional collaboration is preferred over national and international collaboration. This may be attributed, in part to, ease of communication amongst researchers as they remain in constant touch with each other during working hours. Research on Lavender is more in need of an international collaboration since the researcher-divides can be bridged and a better research output may be attained by a joint collaboration at an international level [55–57]. There need to be a substantial shift in the preferences of collaboration from institutional to international which will help in increasing the visibility of scientific publications in the field of Lavender. This study also reveals that most of the contributing authors are from high economy zone. Research activities cannot be done in isolation nor is it possible to pursue research at an individual level due to economic and infrastructural constraints. It requires proper backing of parent institution in terms of basic infrastructure and adequate financial support which is more supportive for institutions and researchers from developed nations. Thus, the economic stability of the parent institution or the host country has a direct impact on its research activities.

It has been seen that *Lavandula angustifolia* is the most prominent species on which majority of the work has been carried out. *Lavandula angustifolia,* commonly referred to as lavender, is the most widely cultivated species which makes it a choice for research on a wider canvas. Only three species, all of which are found in Europe have been used routinely as remedies: *Lavadula angustifolia* (English lavender), the closely related *Lavandula latifolia* (spike lavender), and *Lavandula stoechas* (French lavender). A fourth species employed for preparing the lavender oil is *Lavandula* × *intermedia*. The hybrid is cultivated because its flowers produce greater quantities of the essential oil than English lavender. The fragrance of the English lavender is considered the most pleasing of the group [1]. This may be a sound reason for *Lavandula angustifolia* being the most researched species in the genus Lavandula. On the other hand, authors have given less consideration to other species resulting in low number of publications with regards to those species. There is potential for research on other species that have received less attention to date.

English has remained as a main communication medium for the dissemination of work in the field of Lavender. Various studies have also ascertained the dominance of English language as communicative medium in other fields [38–43]. The universal acceptance of English as the research communication language has fairly minimized the problem of language barrier for the free flow of information.

6.1. Limitations

The study though is based on the data gathered through two leading databases, *Web of Science* and *SciVerse Scopus*. It is possible that further articles have been published that are not indexed in either of these databases. The study focuses on a 5 year period and patterns of publication may have been different had other periods of time been chosen. Numbers of publications are used as a measure of research activity and this may also not truly reflect the extent of research activity but provides an indication of this.

7. Conclusions

While growth of the literature in this field has not been consistent, continued research interest in Lavender has been revealed in by this study. Research activity is apparent in a wide range of countries but there is potential for greater international collaboration. The outcomes of research are also widely scattered across numerous journals reflecting the diversity in research being conducted. While the focus has been on a limited number of species of lavender, the large number of available species that have received limited research interest could provide a focus for research.

Conflict of interest

The authors have no conflict of interest to declare

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