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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.

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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, inter-relationship 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 1
Yearly distribution of publications.

Year	No. of publications	Growth rate	Compound annual growth rate	Relative growth rate ^a	Doubling time ^a
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

^a 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.

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

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