

# Garlic as a *Allium Sativum* Source: Bibliometric Review

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DOI: <https://doi.org/10.51244/IJRSI.2024.1108008>

Received: 24 June 2024; Revised: 19 July 2024; Accepted: 23 July 2024; Published: 28 August 2024

## ABSTRACT

This study aimed to use bibliometric methods to analyze research trends on Garlic as a medicinal plant. A total of 420 publications were obtained from the PubMed database for the period 2014-2024. The results showed that the number of publications on garlic research increased from 2014 to 2023, with a slight decrease in 2024. The most common keyword co-occurrences were "high-fat diets," "blood pressure," "cholesterol," and "human." This suggests that Garlic has been widely studied for its potential health benefits in these areas. The study also found that there are still some areas of garlic research that are relatively new, such as "chemometrics" and "molecular docking." Overall, the results of this study suggest that Garlic is a promising medicinal plant with a wide range of potential health benefits.

**Keywords:** *Allium sativum*, Garlic, bibliometric, VOS viewer

## INTRODUCTION

Garlic (*Allium sativum* L.) belongs to the Alliaceae family, believed to originate from Central Asia (India, Afghanistan, West China, and Russia) and spread to other parts of the world through trade and colonization. The value of garlic as a plant has been known since ancient times; it is estimated that it has been cultivated for more than 5000 years. As a cash crop, it is used to earn foreign currency by exporting to European, Middle Eastern, and African countries. Among the ten largest garlic producers, China is the largest producer, accounting for more than 78% of total world production (22.27 million tons). Other main producing countries are India, Bangladesh, the Republic of Korea, Egypt, Spain, the United States, Uzbekistan, Russia, and Myanmar (FAOSTAT, 2018). Ethiopia has placed number 15 in the world ranking.

Garlic has an important role in the horticulture sector. Garlic has been widely used traditionally as a spice component in cooking and has become an important ingredient in the food processing industry. Garlic has also long been used in the health sector as a herbal medicine or health supplement. Garlic contains essential oils which can act as anti-bacterial and antiseptic (Solehah & Fariyanti, 2024).

This plant is known to have the highest medicinal properties, with the presence of more than 33 bioactive component compounds containing sulfur, which are effective in inhibiting the growth of bacteria, viruses, and fungi. The main content in garlic bulbs is the compound allicin (allylcin) which contains sulfur (thio-2-propenen-1-sulfinic acid S-allyl ester). Apart from that, this plant also has various medicinal effects related to nerve protection, liver protection, anti-fatigue effects, and prevention and treatment of cancer and cardiovascular disease (Fajar & Bimo, 2022).

Bibliographic analysis provides valuable insights into research trends, gaps, and future research directions. This analysis helps in recognizing the impact of scientific results, determining research directions, and understanding technological developments in various fields. Bibliographic analysis helps identify the most studied topics, current issues, and trends in academic research by measuring and visualizing qualitative data. Overall, bibliographic analysis is important in guiding researchers toward new research perspectives, avoiding duplication, and using resources effectively while highlighting limitations that researchers need to be aware of (Abdullah et al., 2023; Senyapar, 2023).

## MATERIALS AND METHOD

### Data sources

The data carried out in this research regarding garlic were obtained from Publisher Medline (Pubmed: [PubMed \(nih.gov\)](https://pubmed.ncbi.nlm.nih.gov)), which is managed by the National Center for Biotechnology Information (NCBI), United States. The source of information regarding garlic was obtained from the Pubmed database because it provides more accurate and extensive data. The keywords used in searches on the Pubmed database are "Garlic" OR "allium sativum." The scientific literature searched contains one of the keywords, terms, or phrases in the title, abstract, article, or keywords. Overall, 420 publications were obtained. Scientific literature is published in English, and the scientific literature used is from the last ten years (2014-2024).

### Data Extraction and Analysis

Data extraction and analysis were carried out by collecting existing scientific literature information, including titles, abstracts, keywords, and relevant articles. Once the data is extracted, analysis is performed to understand and analyze the collected data. The collected literature is stored in "RIS" format. The data was then exported to Vos viewer version 1.6.19 for further bibliometric analysis. Parameters used for analysis results include publication trends, contributing publisher analysis, keyword co-occurrence network, and overlay. Data extraction and analysis are described in Fig. 1.

### Term map

Researchers with various scopes of study have used bibliometric analysis. Bibliometrics is a statistical method for analyzing publications, which is a complete research method that encompasses science, mathematics, and statistics in analyzing knowledge quantitatively. The application used as a mapping tool is VOS viewer. VOS viewer is software that can be used to build and visualize bibliometric networks such as journals, titles, authors, and publications. Vos viewer software is capable of mapping various types of bibliometric analysis which produces the ultimate bibliographic database Advanced visualization with visual labeling. With this application, researchers can find research variables that are still little researched and variables that have already been researched. Based on the keywords used, the results of the analysis using Vos Viewer in the scope of the study, which is still little used, can be used as a reference (Iriyani et al., 2023).

## RESULTS AND DISCUSSION

### Publication trends

The latest research literature was taken from Pubmed and collected and saved on May 21, 2024. A total of 420 literature sources were found in publications identified in the last ten years, from 2014 to 2024, in Figure 1. It can be seen that there was an increase in publications related to the keywords "*allium sativum*" in 2020-2022. However, in 2024, it experienced a decline, and in 2023, there was an increase in publications in 2018, there was a decrease.

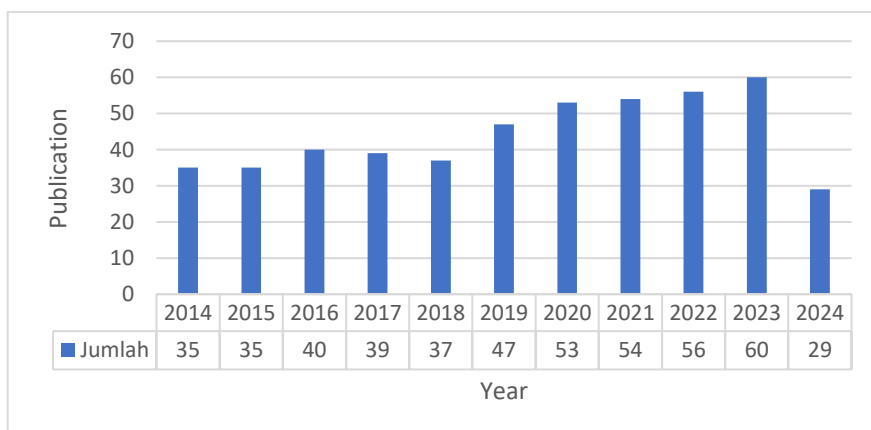


Fig. 1. Trend publikasi pada "*allium sativum*"



Based on the visualization of research results in Fig. 3, the research trend regarding garlic as a medicinal plant from 2014-2024 was mostly carried out in 2014-2020, as shown by the greenish-purple color on the bubble map. Meanwhile, purple bubbles indicate that research on this topic has been carried out for a long time. However, there are also research areas related to garlic that are still being explored, such as garlic research on chemometrics and molecular docking. This is reflected in the yellow color on the bubble map, which shows that the research was carried out in 2024 and is relatively new.

## CONCLUSION

Bibliometric studies of garlic as a medicinal plant include assessing and measuring various characteristics of scientific literature, such as scientific publications, citations, author partnerships, research networks, and other trends. From various sources obtained from the Pubmed database between 2014-2024. Based on the VOS viewer visualization results, the research trend on *Allium sativum* as a medicinal plant appears to be increasing starting in 2014 but decreasing in 2024, with the maximum number of publications in 2023.

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