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Mapping the Terrain: Bibliographic Insights into Phytoconstituents and Cancer

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ABSTRACT

There is a need for an alternate therapeutic approach due to the growing global cancer burden. Herbal therapy offers a highly practical substitute for conventional cancer treatment. This article examines the bibliographic examination of studies conducted in the fight against cancer that used phytoconstituents and the VOS reader to search the Scopus database. The thorough literature evaluation that served as the foundation for this study was carried out by searching the database Scopus for pertinent keywords. This study employs bibliographic analysis techniques to investigate the interplay between phytoconstituents and cancer research. Leveraging search keywords such as "phytoconstituents" and "cancer," the analysis delves into citations, countries of publication, affiliated organizations, authors, and bibliographic coupling. By scrutinizing citation patterns, this study unveils the interconnectedness of 137 research articles, identifying seminal works and key contributors in the field. Furthermore, the geographical distribution of publications sheds light on 34 countries that met the threshold on the global dissemination of knowledge in phytoconstituents and cancer research, while organizational affiliations provide insights into collaborative networks and research trends. Additionally, 753 authorships were found in the analysis, elucidating the prolific researchers driving advancements in this interdisciplinary field. Finally, bibliographic coupling analysis offers a deeper understanding of the intellectual connections between research articles, elucidating thematic clusters and emergent research directions among 32 items. This bibliographic analysis serves to enrich scholarly understanding, guide future research endeavors, and inform evidence-based decision-making in the realm of phytoconstituents and cancer research.

Key words: Citations, bibliography, cancer, evidence-based, authorships.

INTRODUCTION

In 2018, there were 9.6 million cancer-related deaths and 18.1 million new instances of the disease. Bray, et al (2018) says that research on cancer treatment has emerged as a completely new field. Both extremely contemporary and old methods are used to treat cancer. Cancer is treated using a range of methods, such as radiation treatment, chemotherapy, and surgery. They all have certain drawbacks, albeit. Conventional chemical usage has toxicities and negative effects (Prasad, Gupta et al 2014). However, because the issue still exists, novel strategies are required for disease control, particularly in light of the shortcomings of traditional chemotherapeutic methods. Thus, in order to reduce the number of people dying from cancer, new approaches to its prevention and treatment are required.

Herbal therapy has developed into a relatively accessible, non-toxic, and safe source of substances that cure cancer. Because of a variety of qualities, herbs are thought to counteract the effects of illnesses in the body (Newman and Cragg 2016). The usage of herbs was long neglected due to the development of industrial medicine and the business sector (Bodeker, Ong et al., 2005). The introduction of new methods has lowered obstacles related to natural substances, and interest in their application in the pharmaceutical sector has grown (Patwardhan and Warude 2005). The World Health Organisation estimates that 80% of people worldwide still receive treatment using conventional means (Mandal and Kumar 2002).

A thorough search of the electronic database Scopus produced the most pertinent material. "Medicinal plants," "Anticancer activity," "Anticancer herbs," "Anticancer plants," "Mechanism of action," "Animal models," "in vitro activity," and "in vivo activity" were the search terms and phrases utilised. Bibliometric studies have a major role in both research and education. These studies provide a deeper understanding of the qualities and significance of academic work by quantitatively analysing papers, references, and other bibliographic data (WHO 2002). It helps determine the impact and influence of research output by providing

quantitative criteria for analysing the productivity and quality of investigators, establishments, or even whole fields of study. It helps scholars identify recent advancements, trending topics, and future growth opportunities in a certain discipline (Heni, Prasojo et al., 2023).

Data may be used by funding agency, commercial, and academic decision-makers to make wise resource allocations. It is still helpful for charting trends in scholarly, institutional, and national collaboration. Understanding collaborative networks is essential to promoting worldwide information exchange, transdisciplinary research, and partnerships. Citation analysis is a widely used bibliometric method for evaluating the impact of scholarly articles (Yu and Zhang et al., 2020). Citations indicate the influence a publication has on the academic community by displaying the frequency with which other researchers have mentioned it. Policymakers can also benefit from bibliometric studies when creating plans for innovation and research. In order to promote and advance research excellence, well-informed decision-making is facilitated by a thorough awareness of the scientific output and impact landscape (Jia an Mustafa et al., 2023). The analysis of publishing trends and citation patterns using bibliometrics is a useful tool for academic quality assurance procedures. It makes understanding how scientific knowledge is shared and communicated across the research community easier (Fawad and Lei et al., 2022). This information may be used to improve communication strategies and increase the impact of study findings.

When it comes to bibliometrics, the VOS viewer is a helpful tool that aids researchers in efficiently analysing and presenting bibliographical data (Zeshui, Xindi et al 2021). Scholars may do bibliometric analysis and obtain a quantitative and visual understanding of the relationships, dynamics, and structure of academic literature with the aid of the versatile VOS viewer. It may be applied to a variety of tasks at academic institutions and research organisations, such as strategic planning, collaborative analysis, and research evaluation. It facilitates the analysis of journal co-citation networks and the identification of research clusters within a

broader dataset that are associated with authors, search phrases, investigators, and thematic groups. An prolonged period of time can be used by academics to examine bibliometric data by clustering phrases, authors, or publications based on common interests. Consequently, the present effort aims to map anticancer research using bibliometric analysis.

MATERIALS AND METHODS

The methodology utilised in this study is bibliometrica research using metadata research with keywords such as "anticancer AND plant nutrients" from the Scopus Databases (2012–2023). Information kept in BibTex and CSV formats. The input metrics were listed in the initial and second tables. VOS Viewer uses the full counting method to display Scopus

information in CSV format. It explains the relationships between many pieces that are written from different angles. You can get more accurate article correlations by browsing, mapping, and using the content analysis tool (Table 1). Data visualisation is done using Microsoft Excel, and the maps were created using data clusters extracted from the downloaded CSV file created by VOS Viewer.

RESULTS AND DISCUSSION

Table 1. Information for VOS Viewer Analysis

Description	Results
Information about Data	
Timespan	2021:2023
Sources(Journals, Books etc.,)	137
Subject Area	
Pharmacology, Toxicology and Pharmaceutics	90
Biochemistry, Genetics and Molecular biology	49
Medicine	41
Agricultural and Biological Sciences	11
Chemistry	17
Chemical Engineering	02
Engineering	05
Material Science	01
Immunology and Microbiology	05
Environmental Science	02
Physics & Astronomy	02
Multidisciplinary	04
Computer Science	01
Health Professions	01
Material Science	01
Documents Contents	
Limited to Keyword	Plant Extract

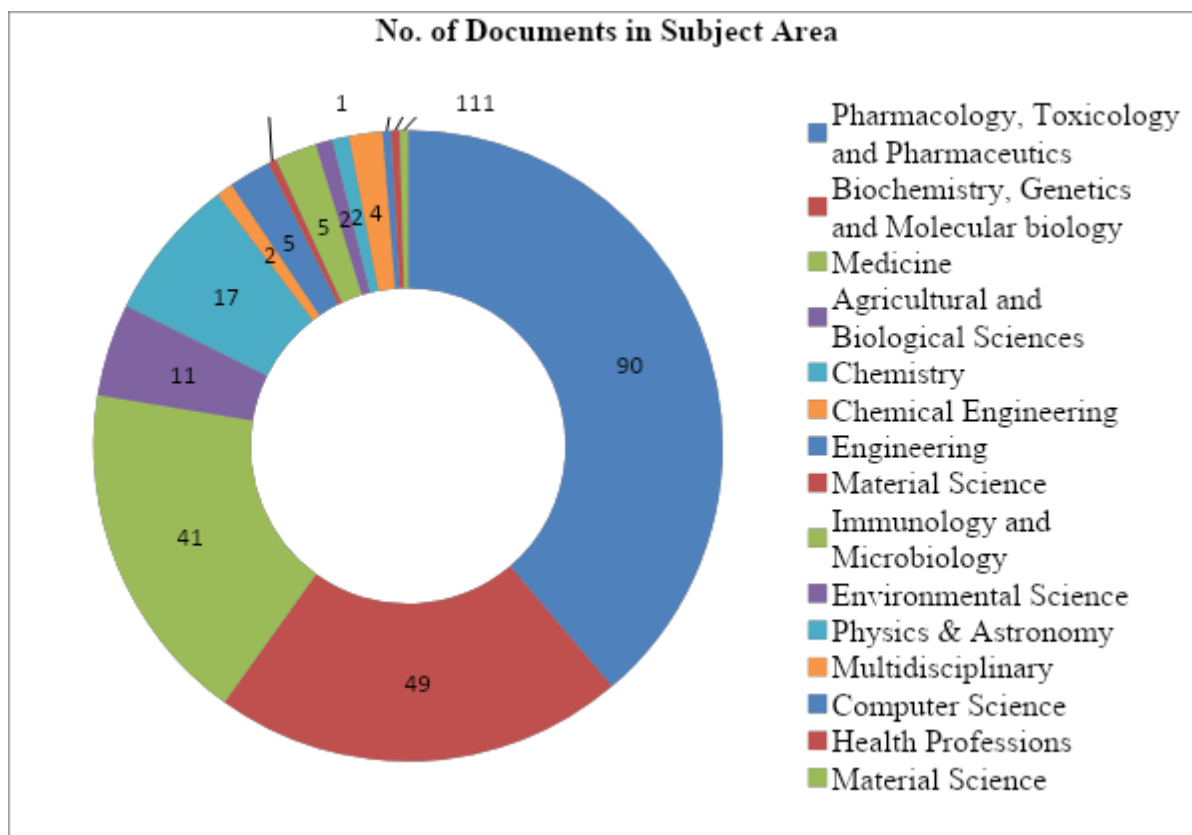


Figure 1. No. of Documents per Subject Area

The varying pattern in the number of published scientific works connected to the research on natural products against cancer from 2012 to 2023 (Fig. 1). There was a notable high in subject area Pharmacology, Toxicology and Pharmaceutics with 90 numbered where research also extends in subject area Biochemistry, Genetics and Molecular Biology bearing 41 documents and third place stands in the area of Medicine with 41 no. of documents where as the subject area Chemistry stands with 17 documents, Chemical Engineering 2, Engineering 5, Immunology & Microbiology 5, Multidisciplinary 4 and Environmental Science, Physics and Astronomy 2 and the last stands up by the subject areas Material Science, Computer Science, Health Professions and Material Science bears 1 document each. A scopus index search of

publications published between 2012 and 2023 produced 137 documents items pertaining to studies on phytoconstituents acting against cancer.

Practically speaking, abstract readability is just as significant. The article's length, the number of keywords it contains, and its title are all meaningless or have minimal practical significance. Still, there is a clear relationship between more citations and lengthier abstracts. Citations were also connected to the collaboration, document, and journal features (Fig. 4 to 6). The results provided new and convincing statistical evidence that research papers should be written with several authors, published in high-impact journals, cite all pertinent sources, and have lengthy abstracts.

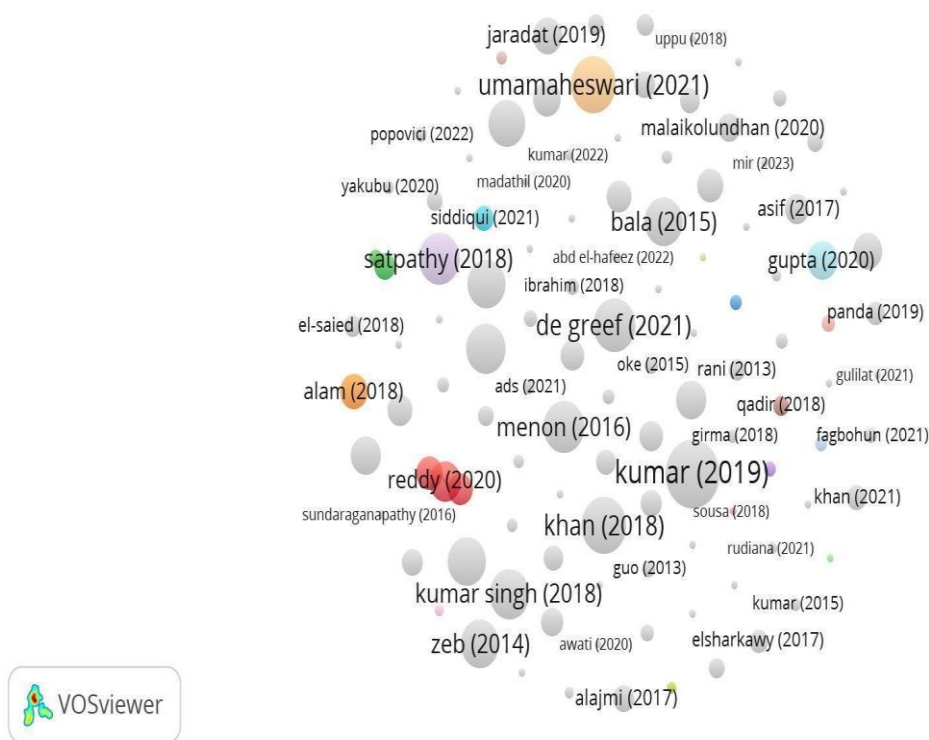


Figure 2. Unit of Analysis mentioning Citations and Documents

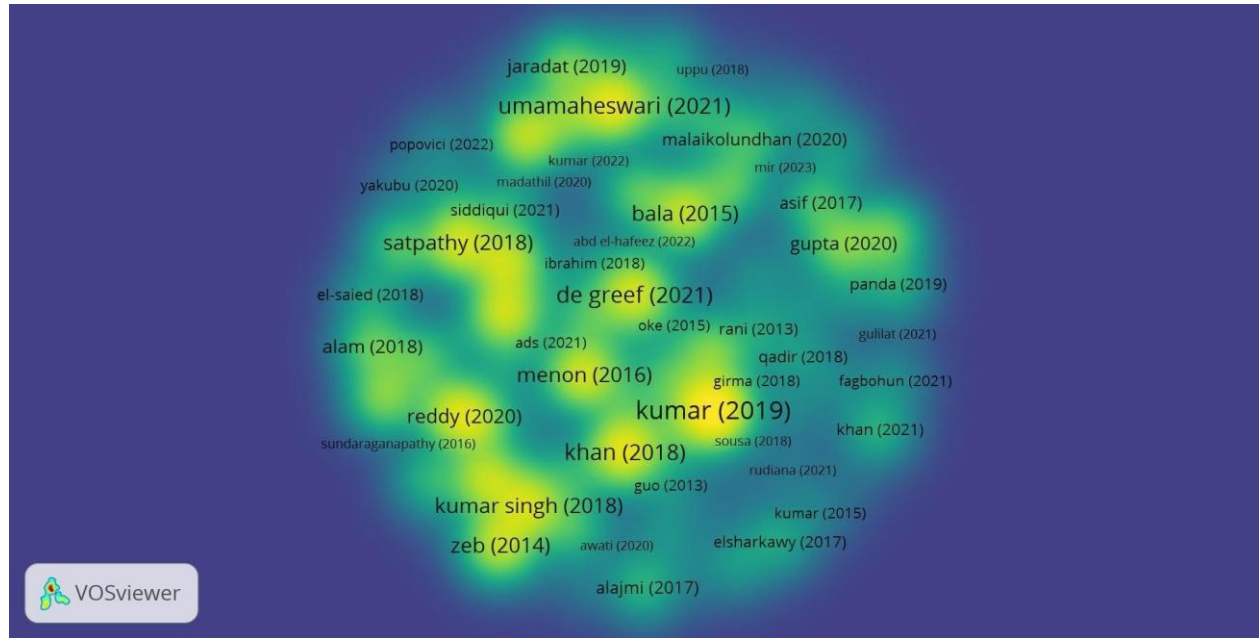


Figure 3. Density view - Unit of Analysis mentioning Citations and Documents

Examining the data using a graphical representation from the CSV file that was produced with the aid of VOS Viewer, it was discovered that out 137 documents in setup of minimum no. of citations is set as 1 resulted in 112 documents meet the threshold where as 3 items were connected more namely the authors Kumar R.; Singh A.K.; Gupta A.; Bishayee A.; Pandey A.K. have 104 citations, Authors De Greef D.; Barton E.M.; Sandberg E.N.; Croley C.R.; Pumarol J.; Wong T.L.; Das N.; Bishayee A. have 62 citations and Menon A.; Vishnu Priya V.; Gayathri R. bears 59 citations which had represented in cluster form (Fig 2 & 3). The search relating to Citations versus organizations when the input of minimum no. of documents of an organization is set as 1, out of 436 organizations, 359 meet the threshold. Among 359 organizations, 13 items had the largest set of connections.

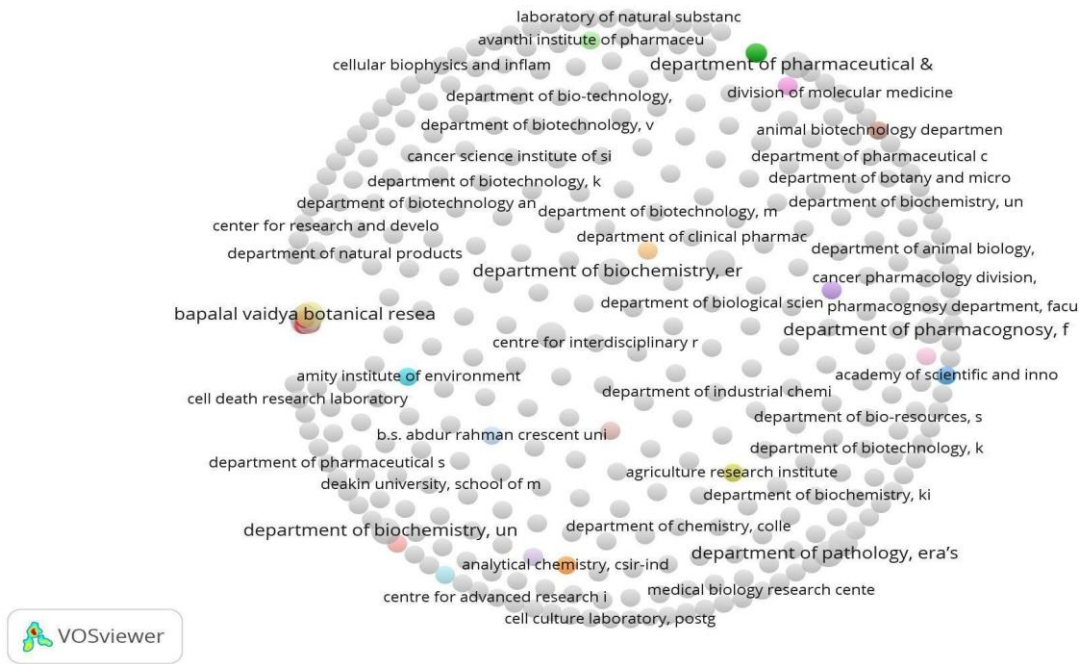


Figure 4. Unit of Analysis mentioning Citations and Organizations

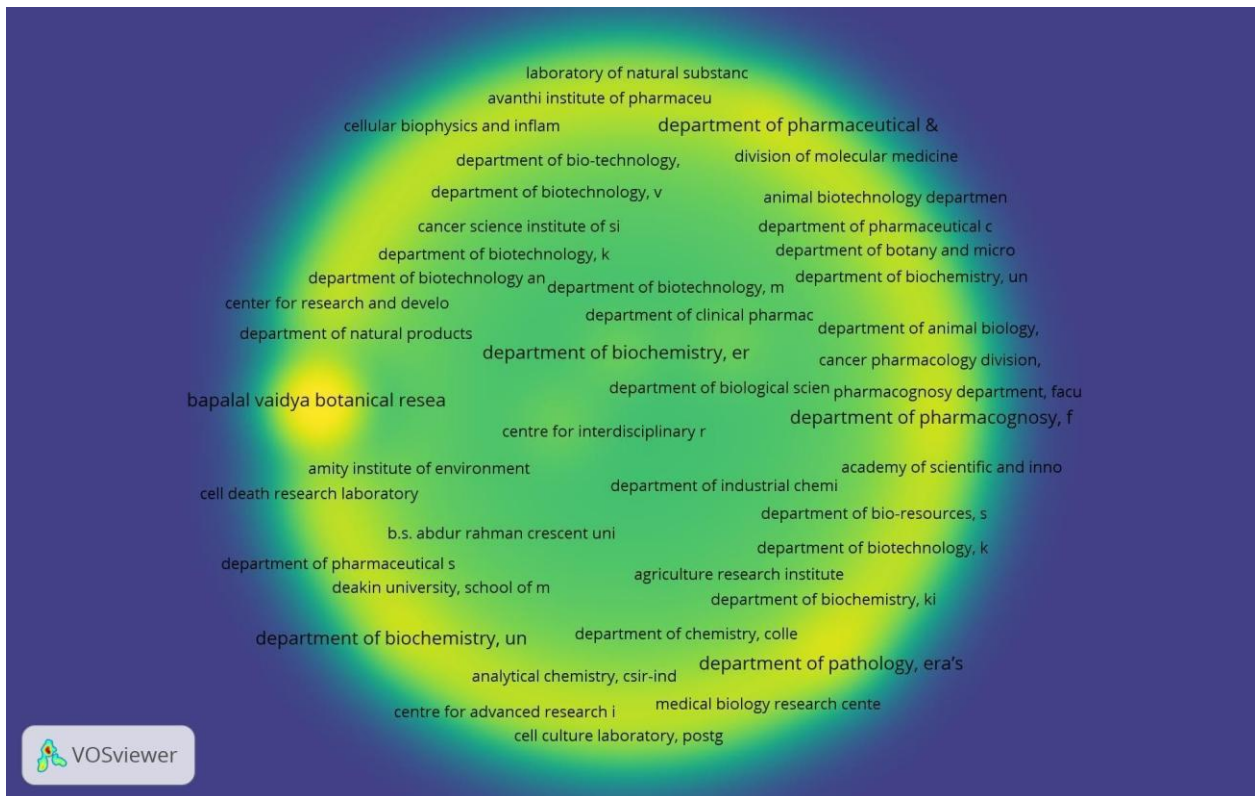


Figure 5. Network Visualization mentioning Citations and Organizations

Bibliographic analysis, encompassing citations and countries of publication, serves as a robust methodology for understanding the dynamics of scientific research within specific domains, such as phytoconstituents and cancer studies (Christine and Andrew et al., 2021).

Citations play a crucial role in bibliographic analysis as they provide insights into the influence and impact of research articles within a given field. By analyzing citation patterns, researchers can identify seminal works, key contributors, and thematic trends. Citations also facilitate the exploration of intellectual connections between research articles, uncovering clusters of related studies and emergent research directions (Glanzel and Thijs 2017). This allows for a deeper understanding of the knowledge landscape and aids in the identification of gaps or areas for further exploration (Leydesdorff 2007).

Moreover, bibliographic coupling, a technique derived from citation analysis, provides additional layers of insight by examining the relationships between documents based on their shared citations. This method enables the identification of closely related research clusters and facilitates the exploration of interdisciplinary connections within and across fields (Vargas, de Moya et al., 2007). Through bibliographic coupling, researchers can uncover hidden relationships between seemingly disparate topics, fostering interdisciplinary collaboration and innovation (Cronin and Meho et al., 2008). When the unit of analysis is Bibliographic coupling among the countries while the minimum no. of documents of a country is set as 1, out of 38 countries, 34 meet the threshold. Among 34, 32 items were shown the largest set of connected items (Fig. 4 & 5). The search related to citations and sources, out 436 organizations, 359 meet the threshold. Among 359, 13 items were connected as the largest set of connected items. The citations over the author depicted that out of 753 authors, 630 meet the threshold. Out of 630 items, 18 items meet largely connected (Fig. 6).

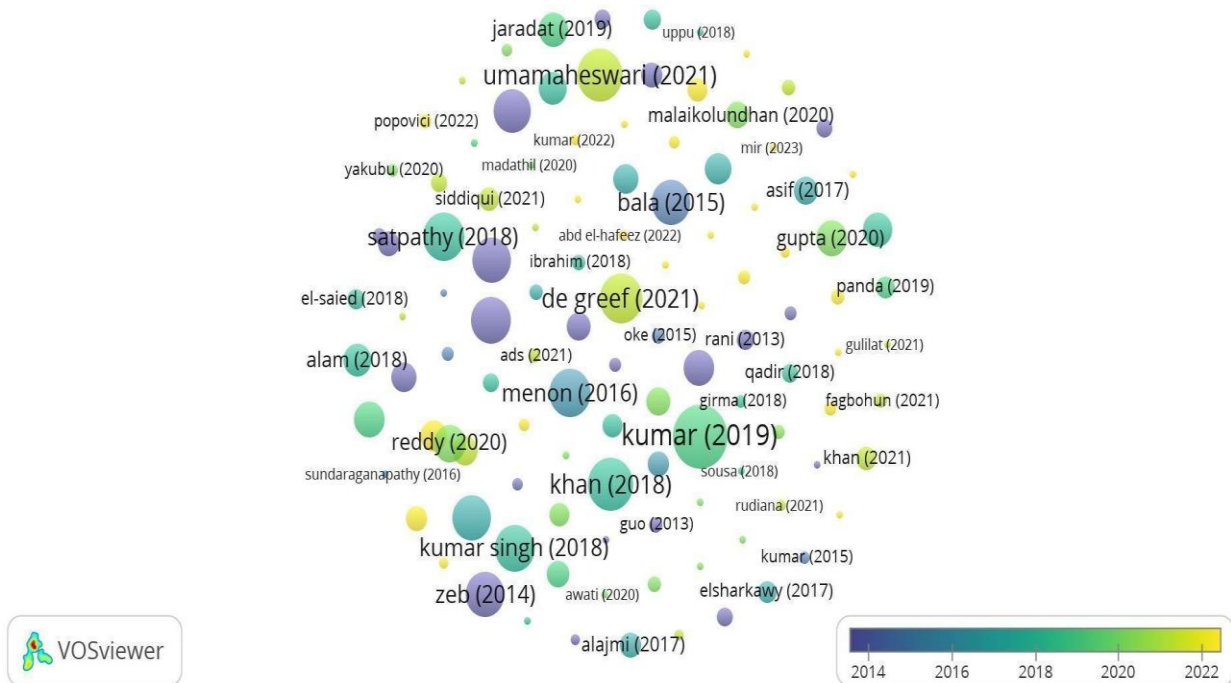


Figure 6. Over lay Visualization mentioning Citations and Documents

Citations serve as a fundamental component of bibliographic analysis, offering a quantitative measure of the influence and impact of research articles (Glanzel et al 2004, Hemalata et al., 2024,). By analyzing citation patterns, researchers can identify seminal works, key contributors, and emerging trends within the field (Katz et al 1997, Mohan Gandhi et al., 2023). Citations also facilitate the exploration of intellectual connections between research articles, revealing thematic clusters and interdisciplinary relationships (Raveesha et al 2023, Raveesha et al 2022, Raveesha et 2017). Understanding citation patterns enables researchers to identify gaps in knowledge, track the dissemination of ideas, and assess the overall trajectory of research within the field (Krishnaveni et al., 2023, Raveesha et al., 2016).

Written and published studies are worth more when they have more citations (104). These results imply that the quantity of research and the number of citations have a direct correlation. Using

the VOS viewer application, a network of sources, authors, nations, and organisations for each participant's citations was created. Regarding data selection and thresholds, an author is required to have at least one document and one reference. Thirteen clusters, representing the biggest group among the 436 organisations, were noted (Fig. 4).

The clusters that link each node illustrate the relationships among the writers. The dimension of the cluster indicates the number of citations. A bibliographic coupling across nations reveals that 34 countries satisfied the criterion. Additionally, out of the 630 writers, 753 achieved advancement in publications and citations; of these, 18 items are represented by larger nodes.

CONCLUSION

The bibliographic analysis focusing on phytoconstituents and their potential role in cancer offers valuable insights into the burgeoning field of natural compounds and their therapeutic applications. There has been a large tendency in the number of publications pertaining to investigations of phytoconstituents in treatment of cancer; the majority of these articles happened between 2017 and 2023. The Subject Area Pharmacology, Toxicology and Pharmaceutics, the publications were many in related to search components. Moreover, Kumar R, Menon A and De Greef D had more no. of citations. The bibliographic analysis underscores the significance of exploring phytoconstituents as potential therapeutic agents in cancer management. Continued research efforts in this area hold the promise of uncovering novel treatment options that are effective, safe, and accessible to a broader population, contributing to the advancement of oncology and improving patient outcomes.

CONFLICTS OF INTEREST

The authors report no financial or any other conflicts of interest in this work.

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