Type of the Paper (Review)

Traditional Indonesian food: A bibliometric review from 2013-2022

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Abstract

Traditional food is a heritage of a country and therefore brings pride to a country or region. A bibliometric analysis of traditional Indonesian food was conducted in this paper to see the trend over the last decade, analyze the contribution of countries, and analyze the most frequently used keywords. A total of 102 documents were gathered from 66 different sources, including 57 articles, 36 conference papers, 4 reviews, 4 book chapters, and 1 data paper. According to this review, Indonesia is the most productive country in terms of producing articles (92) in this field, as well as having the most citations (315), despite having the lowest average number of citations per article. Surya R was the most productive author, with four documents, and Nuraida L had the most citations, with 111. Tempeh was also the most frequently used keyword, with 13 occurrences. It was hoped that this overview would help to advance research in traditional Indonesian food.

1. Introduction

Traditional food is a part of the cultural character that is passed down from one generation to the next and therefore brings the cultural identity of a region. Understanding the food more than the culinary perspective could be a culture's approach to understanding people or a region (1). Food may be the best way to preserve cultural identity in this age of technological advancement (2), as it will not be eroded by either time or technology. Consequently, more efforts in the field of traditional food research are required.

As a multicultural nation, Indigenous foods in Indonesia are diverse. Indonesia has long been recognized as a country with diverse cultures that have evolved in tandem with the country's growth. This cultural diversity gave significant alteration in the establishment of various food in Indonesia (3) resulting in a myriad number of Indonesian original food (4).

As far as state-of-the-art research in the field of traditional Indonesian food is concerned, it was discovered that the majority of studies are conducted in laboratories, for example, Fithri et., al (5) studies the packaging design in Indonesian traditional food, Ambarsari et., al (6) in their study adopted traditional Indonesian food processing, and Lista et., al (7) who studied "Instant Bose" one of Traditional Indonesian Food. Aside from that, four reviews on traditional Indonesian cuisine have been identified (8–11), but none of them is a bibliometric review.

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In the modern era, traditional food research is expanding beyond the type of food or cultural acceptance to include health, sensory, and even functional food. To stay connected to the past while not avoiding the modern era with its more advanced technology, this overview will look at the trend of research in traditional Indonesian food from 2013 to 2022, analyze the contribution of different countries and authors, and highlight the most relevant author keywords in this field to predict what research will be done about traditional food in the future. Finally, it is hoped that this overview will aid in the advancement of research into traditional Indonesian cuisine.

2. Methods

2.1. Data Collection

Data collection was done using an advanced setting search in Scopus indexed journal using the keywords "Traditional Indonesian" or "Indonesian traditional" and Food. It was feasible to narrow the search in the article abstract, title, and keywords. The research included in this review was performed between 2013-2022. In addition, we perform a limitation to include only the final paper (in publication stage). The data was gathered on October 31, 2022; any changes made after that date are not considered in this review. Figure 1 shows a high-level overview of the data collected, which includes 102 documents from 66 sources.

Timespan	Sources	Documents	Annual Growth Rate
2013:2022	66	102	20.44 %
Authors	**Authors of single-authored docs**	**International Co-Authorship**	**Co-Authors per Doc**
390	6	18.63 %	4.18
Author's Keywords (DE)	**References**	**Document Average Age**	**Average citations per doc**
297	3282	3.15	6.461

Figure 1. Main information of the collected documents obtained on Bibliometrix software.

2.2. Bibliometric Analysis

The data set was obtained and transferred to an open refine (version 3.6.1) application for data refinement. The bibliometric analysis was then completed using Vos viewer (version 1.16.18), tableau, and Rstudio (bibliometrix). The findings were then presented as figures and tables. The flow chart process of this review is depicted in Figure 2.
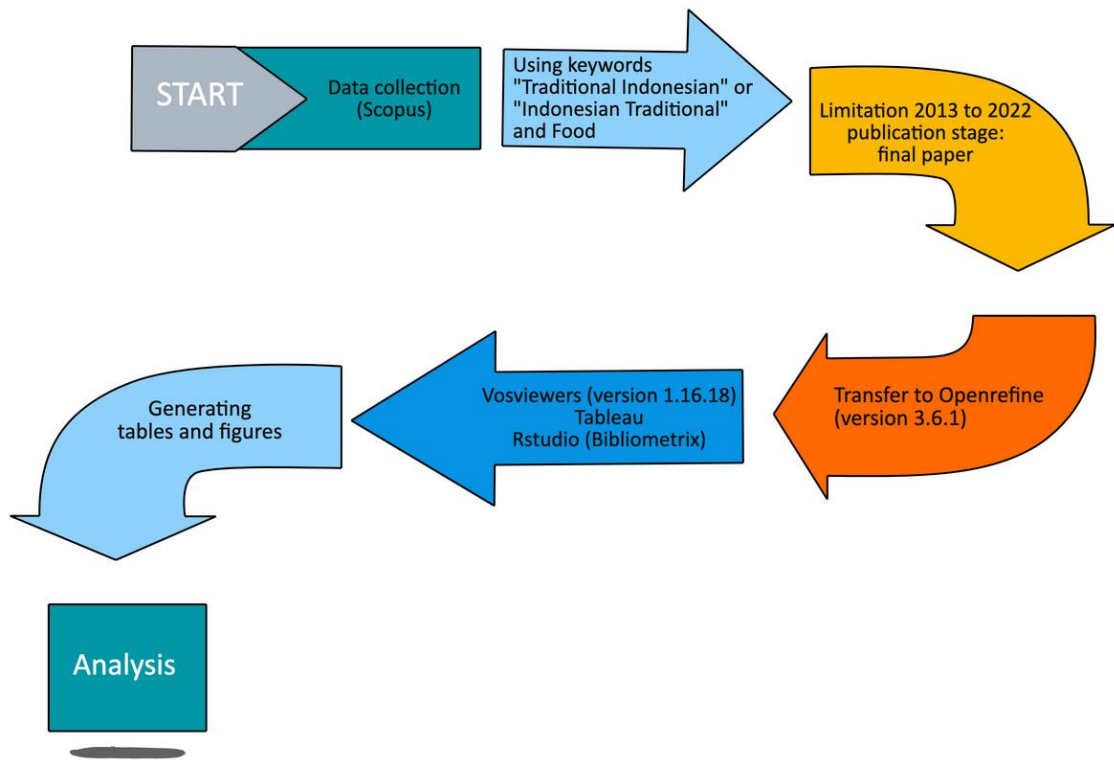
Figure 2. Flowchart of Bibliometric analysis.

3. Results and Discussion

3.1. General Performances of Selected Publications in The Research Field
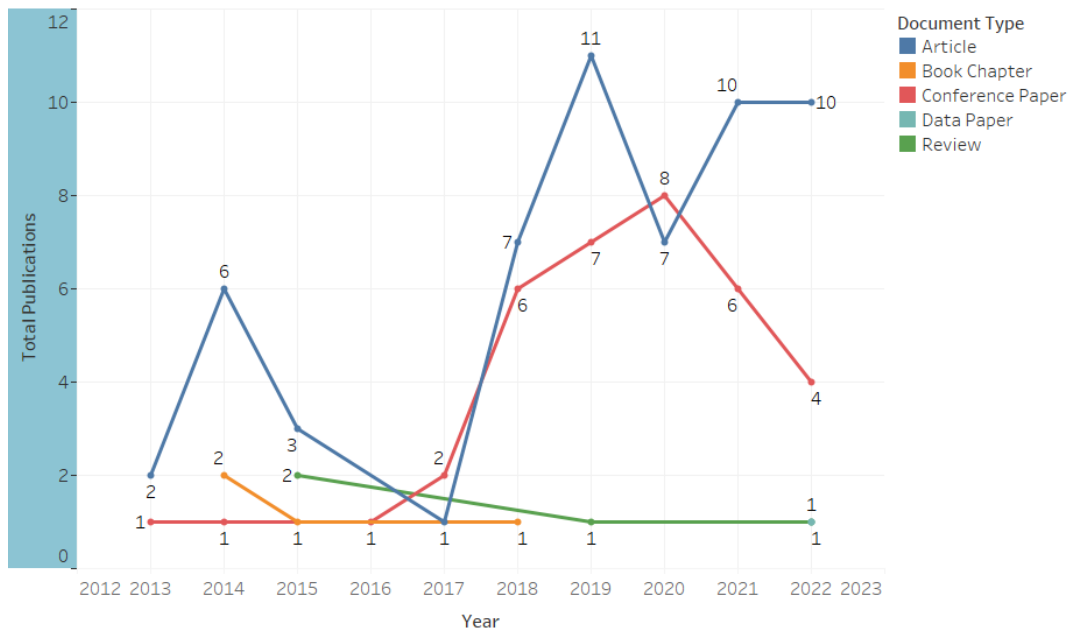

Figure 3. The trend publications of traditional Indonesian food research from 2013-2022.

The quantity and pattern of publications, in general, indicate the extent to which a field is studied. Figure 3 shows that over the last decade, the total number of publications on

traditional Indonesian food has increased. In addition, traditional Indonesian food publications have five document types: article, book chapter, conference paper, data paper, and review. The significance of the book chapter, data paper, and review was overlooked because publications are extremely limited, with no more than two per year. Unlike the document types of articles and conference paper, which both have a high number of publications over the year, they also have a notable trend.

This trend has two noteworthy points. The first year in 2018 (14 documents) saw a significant increase over the previous year (2017; 3 documents). Five years later, the average number of publications in traditional Indonesian food was significantly higher, indicating that research in traditional Indonesian food is currently gaining strength. The second point is the year 2020, when it appeared that the turnover on which conference papers continues to shrink while the article type continues to rise, leading to the prediction that the article type for traditional Indonesian food publication will continue to rise.

Figure 4 demonstrated that from 2013 to 2022, the leading source of papers in this field was still conference proceedings, with 19 papers including (12–14), followed by AIP conference proceedings and IOP Conference Series: Materials Science and Engineering with four papers each. Then there were two journals, Food Research and Hayati Journal of Bioscience, each with four articles. The last five sources were journal articles, with no more than two articles per source. It is clear that the most important articles during this time period came from proceedings.
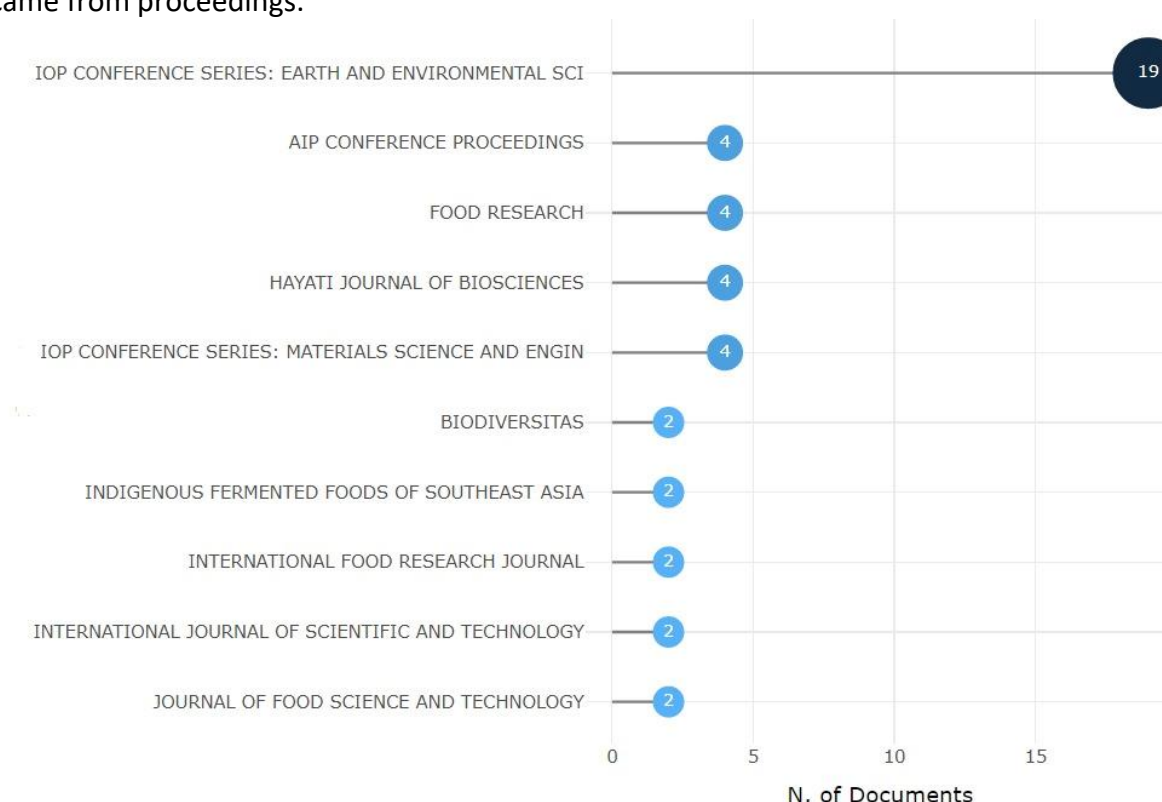

Figure 4. The top 10 sources for publication in the field of traditional Indonesian food research.

3.2. Analysis of Country/Region and Author Contributions

From 2013 to 2022, Traditional Indonesian Food research publications covered a total of 20 countries. After examining the countries that published papers on traditional Indonesian foods (Table 1), Indonesia emerged as the most productive nation, with 92 publications, far

outnumbering any other country with three or fewer. Because the study focuses on Indonesian food culture, it is more accessible to Indonesian researchers. The stark differences in the publications of Indonesia and other countries, on the other hand, have led to the conclusion that most of the other countries involved in this field of study collaborated with Indonesia on this publication, as evidenced by Figure 5, which places Indonesia in the center and connects all other countries to Indonesia. Table 2 shows that, despite being the most productive nation in this field and having the most citations—315—at least four times higher than any other nation, Indonesia ranked last in terms of average citations per document, with 5.08, indicating that many of those documents have yet to be cited. This outcome demonstrates the value of international cooperation.

Table 1. The top 10 most productive countries in the field of traditional Indonesian food research.

Countries	Total documents
Indonesia	92
Australia	3
Japan	3
Netherlands	3
United States	3
Malaysia	2
South Korea	2
Taiwan	2
Thailand	2
United Kingdom	2

Table 2. The top 10 most cited countries in the field of traditional Indonesian food research.

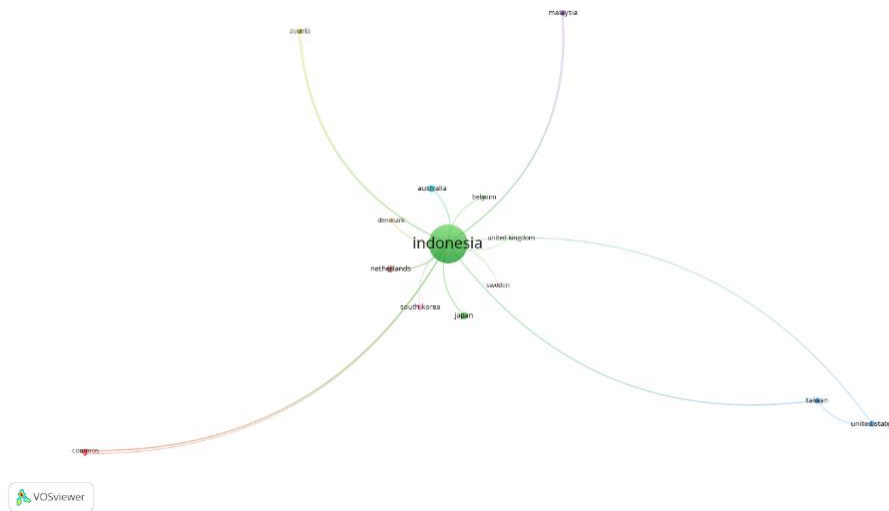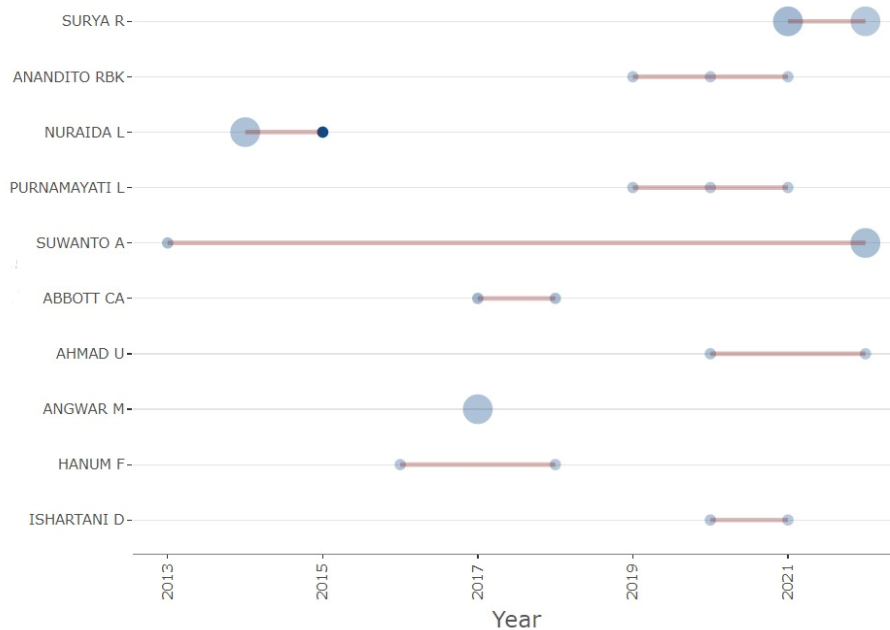| Country	Total citations	Average article citations
Indonesia	315	5.08
Australia	79	26.33
Poland	45	45.00
Brazil	36	36.00
Germany	31	31.00
Denmark	29	29.00
Japan	28	28.00
China	18	18.00
Netherlands	17	8.50
Korea	11	11.00

Figure 5. Co-occurrence network of countries.

Figure 6. Documents production in the field of traditional Indonesian food research from 2013-2022.

An examination of publications from 2013 to 2022 was conducted to identify the most productive researchers in this study field. Figure 6 depicts the output of the top ten authors over the last decade. This figure shows that the most articles written by each author in the last ten years is no more than four. The small circle represents one publication, while the large circle represents two publications. The higher the citation, the darker the color. Surya R was the most productive author in the field of traditional Indonesian food, with four documents published recently (2 articles in 2021 and two in 2022), but the lighter color indicates that the average citation per year remains low, at 1.5 and 0 in 2021 and 2022, respectively. Anandito RBK, Nuraida L, Purnamayati L, and Suwanto A are among the authors, with three documents published in the last ten years and the rest having two. Nuraida was the author with the

darkest color for a single publication in 2015, with an average of 13.12 citations per year (9). After analyzing the most impactful authors in terms of total citations, Nuraida L resurfaced at the top of the list with 111 total citations (Figure 7). Although Surya is the most productive author, the low total number of citations can be explained by the fact that Surya's articles in this field were published recently in the last two years (11,14–16) whereas Nuraida L's publications were published in 2014 and 2015, which were much longer and increased the possibility of gaining more citations (9,17,18).

Figure 7. List author with the highest number of citations in the field of traditional Indonesian food research.

3.3. High Appearance Keywords Used in The Research Field

There are 22 keywords that the authors use the most frequently, with at least two co-occurrences. We looked at keywords that appeared at least twice in the last decade and found 22 met the requirement, which can be divided into six clusters. As shown in Figure 8, each circle represents a keyword, the size of the circle indicates the frequency of the keyword, the line between the circles indicates that they appear together in a publication, and different colors indicate different clusters.

Table 3. Cluster of keywords analysis obtained on Bibliometrix software.

Cluster	Number of items	Keywords on VOSviewer network
1	6	Antioxidant, colorectal cancer, dadih, dietary fibre, fermentation, short chain fatty acids
2	4	Indonesia, rice, sensory, traditional food
3	3	Gaba, lactic acid bacteria, traditional indonesian food
4	3	Antioxidant activity, isoflavones, tempeh
5	3	Flour, physicochemical properties, soybean
6	3	Fermented food, *Lactobacillus plantarum*, probiotic

Table 3 shows that among the most frequently used keywords, fermentation and health promoting agent appear to be the most appealing in clusters 1, 3, 4, and 6. Keywords related

to fermentation include fermentation, lactic acid bacteria, tempeh, fermented food, *lactobacillus plantarum*, and probiotic, as well as colorectal cancer (19), antioxidant, dietary fiber (19), gaba (20), lactic acid bacteria, antioxidant activity, isoflavones, and probiotic. As in clusters 2 and 5, more general keywords such as Indonesia, rice as the main staple food of Indonesia, sensory, traditional food, flour, physicochemical properties, and soybean are used. It is possible to conclude that research and traditional Indonesian foods are strong in the area of fermentation and health promoting agents.

Figure 8a shows that tempeh was the author's most frequently used keyword, with higher appearance keywords in this field that were at least twice as appealing as all other keywords used by the author (Figure 8 and 9). Figure 8b shows that in the last five years, the most frequently used keywords were related to fermentation, such as tempeh, probiotic, lactic acid bacteria, fermentation, and the newest keywords with yellow color were sensory, soybean, isoflavones, antioxidant activity, traditional food, and traditional Indonesian food, many of which were very much related to tempeh product, and this is consistent with the highest co-occurrence of keywords, as shown in Figure 9. Then we examined the data and discovered that in 2022, three of the sixteen publications used tempe/tempeh (16,21,22) in the title, implying that only in the last year there has been approximately 18.75% research on tempeh. In 2021, the number of publications with tempe/tempeh in the title is four (15,23–25) out of sixteen, indicating that tempeh/tempe is responsible for one-quarter of all publications that year. It is reasonable to conclude that tempeh has been one of the most intriguing subjects in this field and appears to be gaining traction.
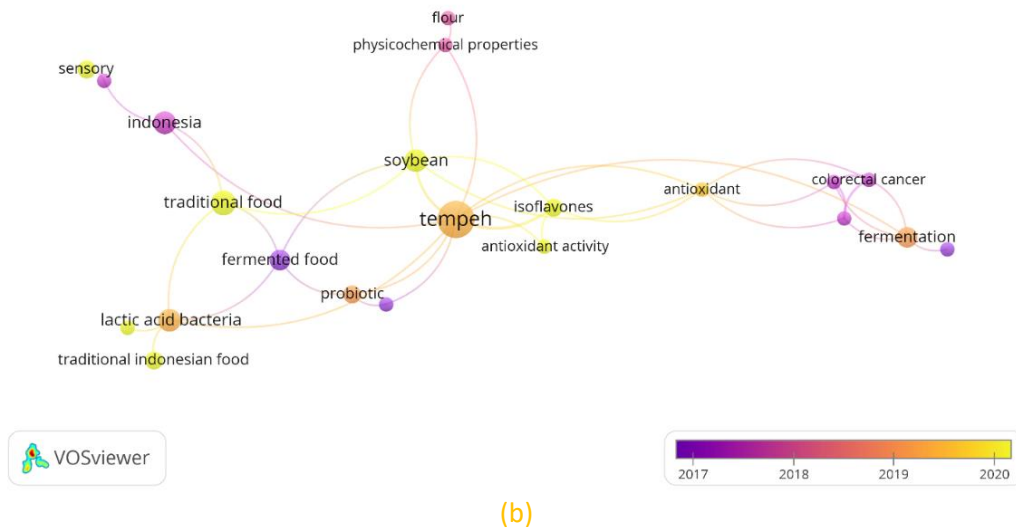

(a)

(b)
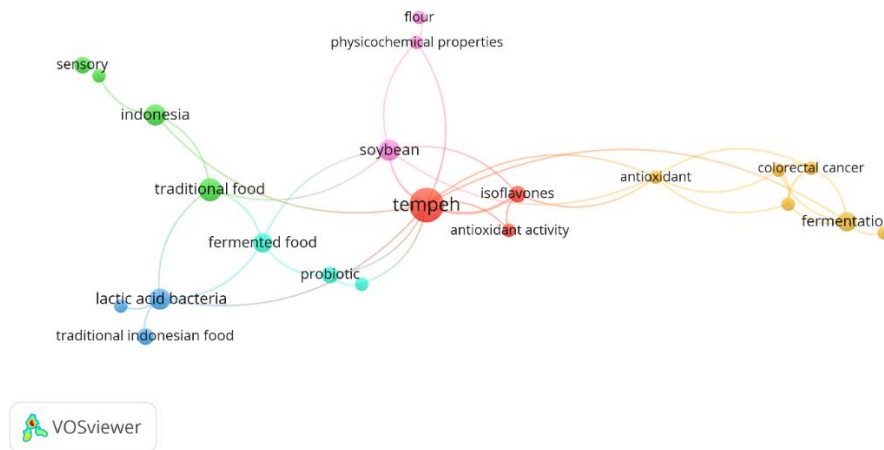
Figure 8. Co-occurrence network of authors' keywords cluster analysis (a) Term average year map. (b) Term map based on the different clusters. The number of connecting lines indicated strong co-occurrence between keywords.
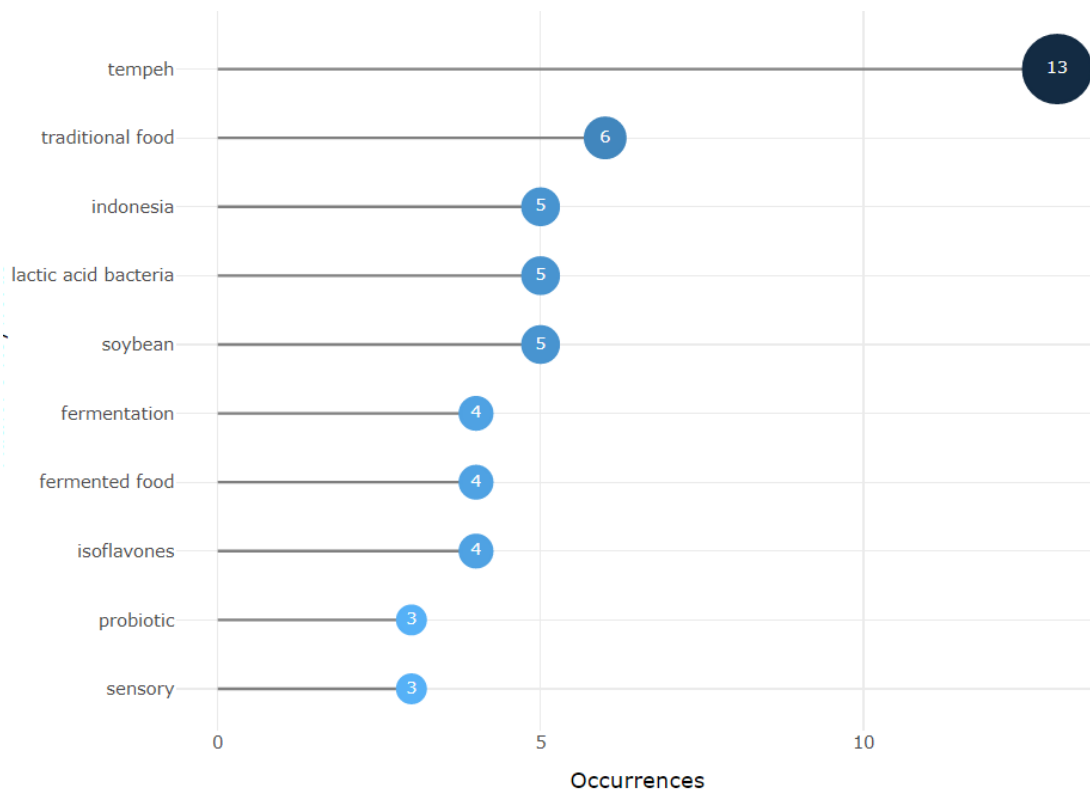

Figure 9. The 10 most frequently keywords used by authors in the last decade in the field of traditional Indonesian food research.

4. Conclusions

This review concludes that research on traditional Indonesian foods has grown stronger over the last ten years, with a significant increase from 2017 to 2018, and particularly in the last

five years. Despite having the least impact based on average citations per article, Indonesia is the most productive country in this field, which can be overcome by increasing international cooperation. Surya R, Anandito RBK, Nuraida L, Purnamayati L, and Suwanto A were the five most productive authors over the last decade, with Surya R producing the most total documents (4 documents) and Nuraida L producing the most total citations (111 citations). Tempeh was the most frequently used keyword, appearing 13 times.

Author Contributions

M.D. conceived and wrote and revised the paper, other authors contribute equally in writing and revising the article.

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Institutional Review Board Statement

Available data are presented in the manuscript.

Data Availability Statement

Not applicable.

Conflicts of Interest

Authors may declare no conflict of interest.

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