



A BIBLIOMETRIC ANALYSIS OF ORANG ASLI RESEARCH IN MALAYSIA: A STUDY BASED ON SCOPUS DATABASE

Asmalita Syaiful^{1*}, Mohd Dzulkhairi Mohd Rani¹, Nizam Baharom¹, Muhammad Shamsir Mohd Aris¹,
Hairulhisyam Ngatiman¹, Nain Nor Aripin¹

¹Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia, 71800 Nilai, Malaysia

*Corresponding Author Email: asmalita@raudah.usim.edu.my

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Abstract

This study aims to identify the research progress and trends in orang asli scientific publications indexed in the Scopus database with the help of the Biblioshiny (Rstudio). The bibliometric analysis of 685 articles was focused on describing the characteristics and trend of the publications performance, word co-occurrence, authors and journal. The main results show that the research publications on orang asli were limited but experienced a positive growth trend from 1968 to 2022. The existing publications in the orang asli research domain are mainly discussed in subject categories of medicine, social sciences, agricultural and biological science, and also the arts and humanities related to orang asli. This study found that the most frequently used words in the publications on orang asli center around health, encompassing a broad range of themes. "Child" and "rural areas" were widely used to conclude that the research on children was quite extensive in various aspects such as illness, genetics and school. This finding will benefit future studies on creating a solid insight on similar areas or to fill the knowledge gaps in the current literature on orang asli research over time.

Keywords: *Bibliometric Analysis; Orang Asli; Scopus; Malaysia*

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INTRODUCTION

Research on indigenous people around the world is widely studied in various aspects and fields. They are found in only 6% of the total worldwide population, estimated at 476 million in over 90 countries, including Malaysia (World Bank, 2023). In Malaysia, orang asli refers to the indigenous peoples of Peninsular Malaysia. They are the minority of the Malaysian population, approximately 215,215 of indigenous people from 33.4 million of the national population (DOSM, 2023). They are considered the original occupants of the land who have unique cultural and historical heritage in Peninsular Malaysia.

There are 178,197 orang asli in Peninsular Malaysia, with the three largest groups consisting of 18 subgroups of tribes. Senoi is the largest group, accounting for 118,138 (54.9%), followed by Proto Malay 90,531 (42.1%), and the smallest group among orang asli is Negrato at 6,546 (3.0%) (DOSM, 2023). They can be found in Pahang (37.9%), followed by Perak (29.9%), and no orang asli is recorded living in Perlis, Penang, and Wilayah Persekutuan (JAKOA, 2021). These indigenous communities have their languages, customs, and traditional practices that are deeply rooted in their connection to the land and nature. The orang asli maintain a close relationship with their ancestral lands, which are essential for their physical and cultural survival as a distinct group (Mat Dong et al., 2022; Shah et al., 2018; Masron et al., 2012).

The global concern for the indigenous population was focusing on their socio-economic disadvantages, health and nutrition problems as a marginalised population. This scenario also has no exception in the orang asli population of Peninsular Malaysia. From the early 1970s until now, there has been much research and study that has been done to understand this minority population in Malaysia (Wallace et al., 2022; Shah et al., 2018). Access to healthcare, education, and basic infrastructure in some orang asli communities has been limited, contributing to socio-economic challenges (Zulkipli et al., 2021; Shah et al., 2018). Efforts have been made by the government and various organisations to address these issues and to improve the well-being of orang asli communities. The establishment of JAKOA (Department of Orang Asli Development) in 1953/4 under a new law, “Aboriginal People” Ordinance No. 3 1954, is the biggest and most significant effort by the government to protect orang asli and their lifestyle from the rapid development of civilisation and exploitation, aside from providing the facilities for academic and suitable development for them (JAKOA, 2023).

Generally, JAKOA is involved in implementing policies, programs and initiatives that aim to address the socio economics by eradicating poverty, cultural preservation, and overall well-being of the orang asli communities and bringing them to be seen by the other segments of communities in Malaysia. Although much research, programmes and governmental initiatives had been carried out for more than 50 years, the progress was happening at a slow pace, and they are still left behind by modernisation compared to the other population in Malaysia (Mat Dong et al., 2022; Shah et al., 2018; Masron et al., 2013). The majority of them (80%) are considered hardcore poor (Chew et al., 2022). Therefore, their financial disadvantage scenarios and any relating factors or crucial areas should be addressed precisely in order to understand the whole challenges that persist in this community to ensure that they are not left marginalised. This study aimed to give a summary of the orang asli in Peninsular Malaysia by identifying the topics that have been studied using a bibliometric analysis of data from the Scopus database from 1968 to 2022. The study analyses are based on the total number of publications, trends in keywords, subject areas, authors, and journals related to orang asli research. Mapping the scientific research in orang asli allows one to illustrate a global picture of knowledge in orang asli research over time so that it can aid in the betterment of future research in this similar knowledge or field.

METHODOLOGY

Bibliometric analysis is an important quantitative method that allows the evaluation of scientific literature in any field of science. Due to the rapid production of publications in this era, it is also important to evaluate scientists' productivity and journal quality to measure the impact and influence of research articles (Mahapatra & Sahoo, 2022; Cooper, 2015). This can be done by counting the number of times the article is cited after it is published. Being cited by other scientists in a future article giving an overview and allowing mapping on certain trends and topics in that particular field.

This study is primarily an exploratory study to review the orang asli research output by analysing the journals, authors, topics and keywords most related to orang asli. To achieve the objectives of the study, the data has been obtained from the Scopus database (www.scopus.com). The Scopus database is considered the largest database for peer-reviewed articles (Baas et al., 2020), and Scopus includes 100% of Medline content, along with a broader range of additional journals and disciplines, which may make it a more comprehensive resource for certain research purposes and one of the extensively used sources for bibliometric analysis in various fields of study (Elsevier, n.d).

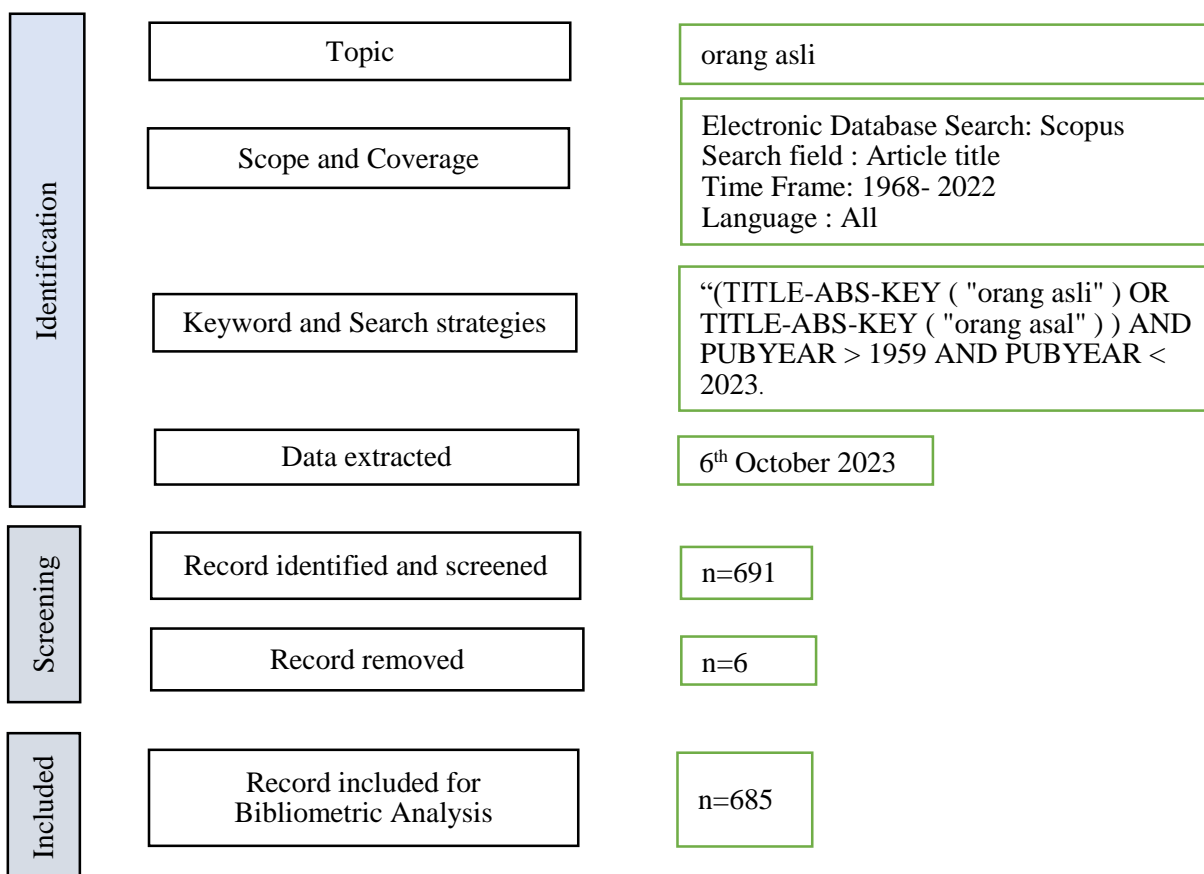


Figure 1: Flowchart of data collection
Source: Scopus database 2023

To extract the data, the search strategy was used on 6th October 2023: “(TITLE-ABS-KEY ("orang asli") OR TITLE-ABS-KEY ("orang asal") AND PUBYEAR > 1959 AND PUBYEAR < 2023. The search did not include the publication from 2023, as the year was still in progress at the time. This search query was used to retrieve as many potential documents as possible but with minimum irrelevant results. All types of documents related to orang asli research publications were gathered, including the research articles, reviews, books, conference proceedings, etc. The top 100 cited documents were reviewed to ensure that the documents aligned with the objective of the study. This search strategy returned 691 publications. Data yielded from the Scopus database were then converted into R-based Biblioshiny (<https://bib-liometrix.org/>) where only 685 documents have been retrieved to be analysed. The descriptive data are presented as numbers, percentages and rankings to show the findings.

RESULT AND DISCUSSION

All extracted documents were evaluated based on research productivity, citation analysis, trends in keywords, subject areas, authors and journals to provide an explorative insight into the research landscape on orang asli in Peninsular Malaysia.

Annual Scientific Production

Figure 2 and Table 1 show annual scientific production, or the number of research articles on orang asli published during 1968-2022 by the Scopus database. The highest number of publications was produced in 2021, with 69 publications. The year 2022 ranks second with 55 publications, 54 publications in 2019, 47 publications in 2020, and 44 publications each year in 2016 and 2018. The cumulative outputs in the last decade (2010-2022) witnessed a sharp growth interest in doing research on orang asli with more than 70% of the selected total articles being published. The oldest article in the database, by Jones A. (1968), “*The Orang Asli: An Outline of Their Progress in Modern Malaya*”, briefly discusses the political and economic development in orang asli influenced by British since the end of the Second World War. Since then, the publication has been slowly growing and recorded to increase in 2007 and continue to rise in the next decade.

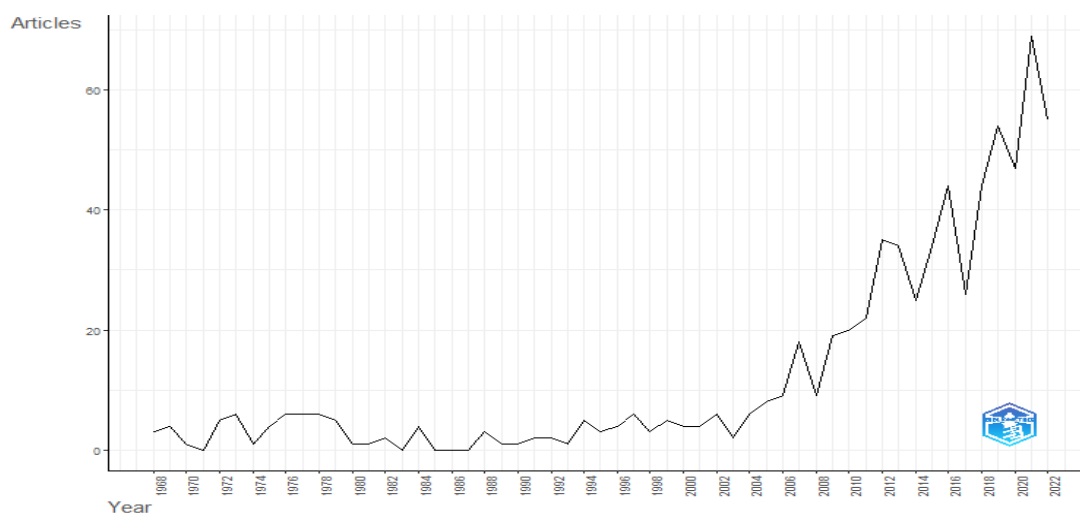


Figure 2: Annual scientific production in Scopus on Orang asli research (1968-2022)
Source: Data extracted from Biblioshiny (2023)

Table 1: Publications by Year

Year	No. of Publications	Percentage (%)
1968	3	0.44
1969	4	0.58
1970	1	0.15
1971	0	0.00
1972	5	0.73
1973	6	0.88
1974	1	0.15
1975	4	0.58
1976	6	0.88
1977	6	0.88
1978	6	0.88
1979	5	0.73
1980	1	0.15
1981	1	0.15
1982	2	0.29
1983	0	0.00
1984	4	0.58
1985	0	0.00
1986	0	0.00
1987	0	0.00
1988	3	0.44
1989	1	0.15
1990	1	0.15
1991	2	0.29
1992	2	0.29
1993	1	0.15
1994	5	0.73
1995	3	0.44
1996	4	0.58
1997	6	0.88
1998	3	0.44
1999	5	0.73
2000	4	0.58
2001	4	0.58
2002	6	0.88
2003	2	0.29
2004	6	0.88
2005	8	1.17
2006	9	1.31
2007	18	2.63
2008	9	1.31
2009	19	2.77
2010	20	2.92
2011	22	3.21
2012	35	5.11
2013	34	4.96
2014	25	3.65
2015	34	4.96

2016	44	6.42
2017	26	3.80
2018	44	6.42
2019	54	7.88
2020	47	6.86
2021	69	10.07
2022	55	8.03
TOTAL	685	100.00

Average Citation per Year

Figure 3 and Table 2 summarise the annual publication and citation structure. The time span of the research carried out on orang asli was published for more than 5 decades, from 1968 to 2022. Based on the average total citation for each article, it was indicated that the publication in 2008 gained the highest number of citations at 2.36. This indicates that 2008 saw more citations for papers than any other year.



Figure 3: Average Citation Per Year
Source: Data extracted from Biblioshiny (2023)

Table 2: Total Citation

Year	Mean TC per Article	N	Mean TC per Year	Citable Years
1968	4.67	3	0.08	57
1969	0.75	4	0.01	56
1970	16	1	0.29	55
1972	21.8	5	0.41	53
1973	1.33	6	0.03	52
1974	4	1	0.08	51
1975	4.5	4	0.09	50
1976	5.5	6	0.11	49

1977	7.17	6	0.15	48
1978	9.67	6	0.21	47
1979	3.4	5	0.07	46
1980	6	1	0.13	45
1981	8	1	0.18	44
1982	25.5	2	0.59	43
1984	3.75	4	0.09	41
1988	5	3	0.14	37
1989	8	1	0.22	36
1990	0	1	0	35
1991	14.5	2	0.43	34
1992	16	2	0.48	33
1993	70	1	2.19	32
1994	19.2	5	0.62	31
1995	22	3	0.73	30
1996	5.25	4	0.18	29
1997	16.5	6	0.59	28
1998	17.67	3	0.65	27
1999	6.2	5	0.24	26
2000	11.5	4	0.46	25
2001	32.5	4	1.35	24
2002	19.5	6	0.85	23
2003	23	2	1.05	22
2004	19.17	6	0.91	21
2005	22.25	8	1.11	20
2006	30.11	9	1.58	19
2007	13.67	18	0.76	18
2008	40.11	9	2.36	17
2009	21.89	19	1.37	16
2010	15.35	20	1.02	15
2011	11.55	22	0.83	14
2012	16.37	35	1.26	13
2013	17.29	34	1.44	12
2014	18	25	1.64	11
2015	11.29	34	1.13	10
2016	9.8	44	1.09	9
2017	4.58	26	0.57	8
2018	4.52	44	0.65	7
2019	6.24	54	1.04	6
2020	5.3	47	1.06	5
2021	2.17	69	0.54	4
2022	1.42	55	0.47	3

Publications types and Sources

Regarding the type of publications, the most common publication type in the area of orang asli research was articles, representing around 81.3% (557), 6.6% book chapters (45), followed by 6.1% conference papers (42), reviews 2.9% (20), and others 3.1% (21).

Table 3: Publication Types

Document Types	Number Articles
Journal article	557
Book chapter	45
Conference Paper	42
Review paper	20
Other (letter, note, erratum etc)	21

Source: Scopus database (2023)

Subject Area

Medicines, immunology, biochemistry, genetics and nursing are all components of discipline in medical sciences and health. By looking at the subject areas in Table 4, it is revealed that the health and medical aspects are the main areas and topics of interest in orang asli research that is extracted from the Scopus database.

Table 4: Subject Areas

Subject Area	Total Publication	Percentage (%)
Medicine	314	26.0
Social Sciences	206	17.0
Agricultural and Biological Sciences	95	7.9
Arts and Humanities	90	7.4
Immunology and Microbiology	88	7.3
Environmental Science	63	5.2
Biochemistry, Genetics and Molecular	60	5.0
Engineering	44	3.6
Economics, Econometrics and Finance	34	2.8
Nursing	34	2.8
Business, Management and Accounting	33	2.7
Computer Science	31	2.6
Multidisciplinary	25	2.1
Energy	16	1.3
Physics and Astronomy	13	1.1
Earth and Planetary Sciences	12	1.0
Psychology	12	1.0
Mathematics	9	0.7
Pharmacology, Toxicology and	8	0.6
Veterinary	6	0.5
Chemical Engineering	4	0.3
Dentistry	4	0.3
Health Professions	3	0.25
Decision Sciences	2	0.2
Materials Science	2	0.2
Chemistry	1	0.1

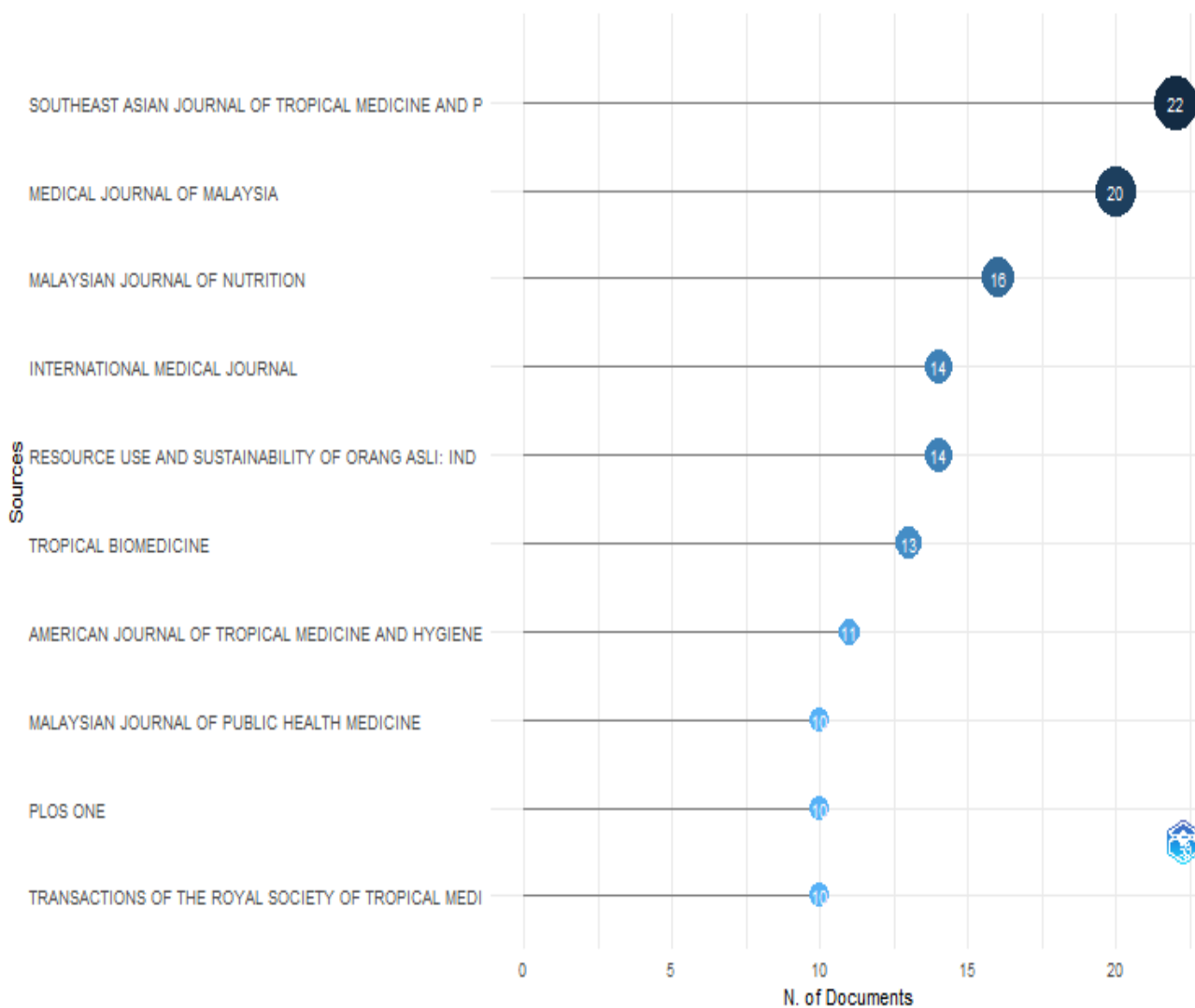
Note: The classification of the publications is based on the source title category which some of it might be put into multiple subject areas

Source: Scopus database (2023)

Most Relevant Sources

Figure 4 and Table 5 show ten journals as the most productive in orang asli research (with ten or more publications). There were 360 scientific journals identified by the Scopus database that published articles in this field. As listed below, the Southeast Asian Journal of Tropical Medicines, the Medical Journal of Malaysia and the Malaysian Journal of Nutrition become the top three influential scientific journals on the research of orang asli.

Southeast Asian Journal of Tropical Medicine and Public Health was in the top list with 22 publications followed by the Medical Journal of Malaysia (20) and the Malaysian Journal of Nutrition with a total of 16 publications. It revealed that these three journals are among the largest contributors to the orang asli literature worldwide. This data also recorded that 9 out of 10 journals were in the fields of public health and general medicine.



Note: The darker the blue colour shows the more quantity and relevance the research theme.

Figure 4: Most Relevant Sources
 Source: Data extracted from Biblioshiny (2023)

Table 5: Top Ten Most Productive Journals

No	Most Productive Journals	No. Articles	Percentage
1.	Southeast Asian Journal of Tropical Medicine and Public Health	22	15.71
2.	Medical Journal of Malaysia	20	14.29
3.	Malaysian Journal of Nutrition	16	11.43
4.	International Medical Journal	14	10.00
5.	Resource Use and Sustainability of Orang Asli: Indigenous Communities in Peninsular Malaysia	14	10.00
6.	Tropical Biomedicine	13	9.29
7.	American Journal of Tropical Medicine and Hygiene	11	7.86
8.	Malaysian Journal of Public Health Medicine	10	7.14
9.	Plos one	10	7.14
10.	Transactions of the Royal Society of Tropical Medicine and Hygiene	10	7.14
		140	100

Source: Data extracted from Biblioshiny (2023)

Most Cited Articles

Table 6 illustrates the list of the top 10 most cited articles that were recorded in the Scopus database. The article entitled “*Leaves of the Same Tree: Trade and Ethnicity in the Straits of Melaka*” by Andaya L.Y. (2008) has been highly cited with 171 citations followed by “*Phylogeography and Ethnogenesis of Aboriginal*” by Hill et al. (2006) with 136 citations, and “*Distribution of glucose-6-phosphate dehydrogenase mutations in Southeast Asia*” by Iwai, K. et al. (2001) with 104 citations. The total citations received by these three articles were the most impactful pieces of research on orang asli based on the Scopus database.

Table 6: Top Ten Highly Cited Articles

No.	Authors	Title	Year	No. of Citation
1.	Andaya L.Y.	Leaves of the Same Tree: Trade and Ethnicity in the Straits of Melaka	2008	171
2.	Hill C, Soares P, Mormina M, Macaulay V, Meehan W, Blackburn J, Clarke D, Raja JM, Ismail P, Bulbeck D, Oppenheimer S, Richards M.	Phylogeography and Ethnogenesis of Aboriginal Southeast Asians	2006	136
3.	Iwai, K., Hirono, A., Matsuoka, H. et al.	Distribution of glucose-6-phosphate dehydrogenase mutations in Southeast Asia	2001	104
4.	Timothy A. Jinam, Lih-Chun Hong, Maude E. Phipps, Mark Stoneking, Mahmood Ameen, Juli Edo, HUGO Pan-Asian SNP Consortium, Naruya Saitou, Evolutionary History of Continental Southeast Asians	“Early Train” Hypothesis Based on Genetic Analysis of Mitochondrial and Autosomal DNA Data	2012	102
5.	Al-Delaimy AK, Al-Mekhlafi HM, Nasr NA, Sady H, Atroosh WM, Nashiry M, Anuar TS, Moktar N, Lim YA, Mahmud R.	Epidemiology of intestinal polyparasitism among orang asli school children in rural Malaysia.	2014	86

6.	Al-Mekhlafi MS, Azlin M, Nor Aini U, Shaik A, Sa'iah A, Fatmah MS, Ismail MG, Ahmad Firdaus MS, Aisah MY, Rozlida AR, Norhayati M.	Giardiasis as a predictor of childhood malnutrition in orang asli children in Malaysia	2005	83
7.	Samuel AJ, Kalusalingam A, Chellappan DK, Gopinath R, Radhamani S, Husain HA, Muruganandham V, Promwicht P.	Ethnomedical survey of plants used by the orang asli in Kampung Bawong, Perak, West Malaysia. J Ethnobiol Ethnomed. 2010 Feb 7;6:5. doi: 10.1186/1746-4269-6-5. PMID: 20137098; PMCID: PMC2843656.	2010	81
8.	S. S. Lee and Y. S. Chang and Mohd Noor Rashid Noraswati	Utilization of macrofungi by some indigenous communities for food and medicine in Peninsular Malaysia	2009	80
9.	Hesham Al-Mekhlafi M, Surin J, Atiya AS, Ariffin WA, Mohammed Mahdy AK, Che Abdullah H..	Pattern and predictors of soil-transmitted helminth reinfection among aboriginal schoolchildren in rural Peninsular Malaysia.	2008	79
10.	Azmi MY Jr, Junidah R, Siti Mariam A, Safiah MY, Fatimah S, Norimah AK, Poh BK, Kandiah M, Zalilah MS, Wan Abdul Manan W, Siti Haslinda MD, Tahir A.	Body Mass Index (BMI) of Adults: Findings of the Malaysian Adult Nutrition Survey (MANS)	2009	76

Source: Data extracted from Biblioshiny (2023)

Most Productive Authors

The Biblioshiny application identified 1876 authors that had researched orang asli. Among them, ten were considered the most productive (with 12 or more articles), accumulating for approximately 26% of the total publications analysed. In general, these authors investigate areas of health and medicine related to the orang asli population. Figure 5 and Table 7 show that Lim Y.A.L. from University Malaya is a prominent author with 30 publications, followed by Al Mekhlafi HM (23) and Mokhtar N with 22 publications. Figure 5 displayed the most productive authors' publication flow and Table 8 shows the list of the highly cited authors over time. The number of publications is represented by the size of the circles, while the intensity of the blue colour indicates the impact of the research in term of the number of citations. It is clear evidence that there has been a concentration of production in the last decade.

Table 7: Top Ten Most Productive Authors

No	Authors	No. of articles
1.	Lim YAL	30
2.	Al-Mekhlafi HM	23
3.	Mokhtar N	22
4.	Anuar TS	21
5.	Norhayati M	16
6.	Abu Bakar S	15
7.	Abdullah R	12
8.	Ghani MKA	12
9.	Phipps ME	12
10.	Salleh FM	12

Source: Data extracted from Biblioshiny (2023)

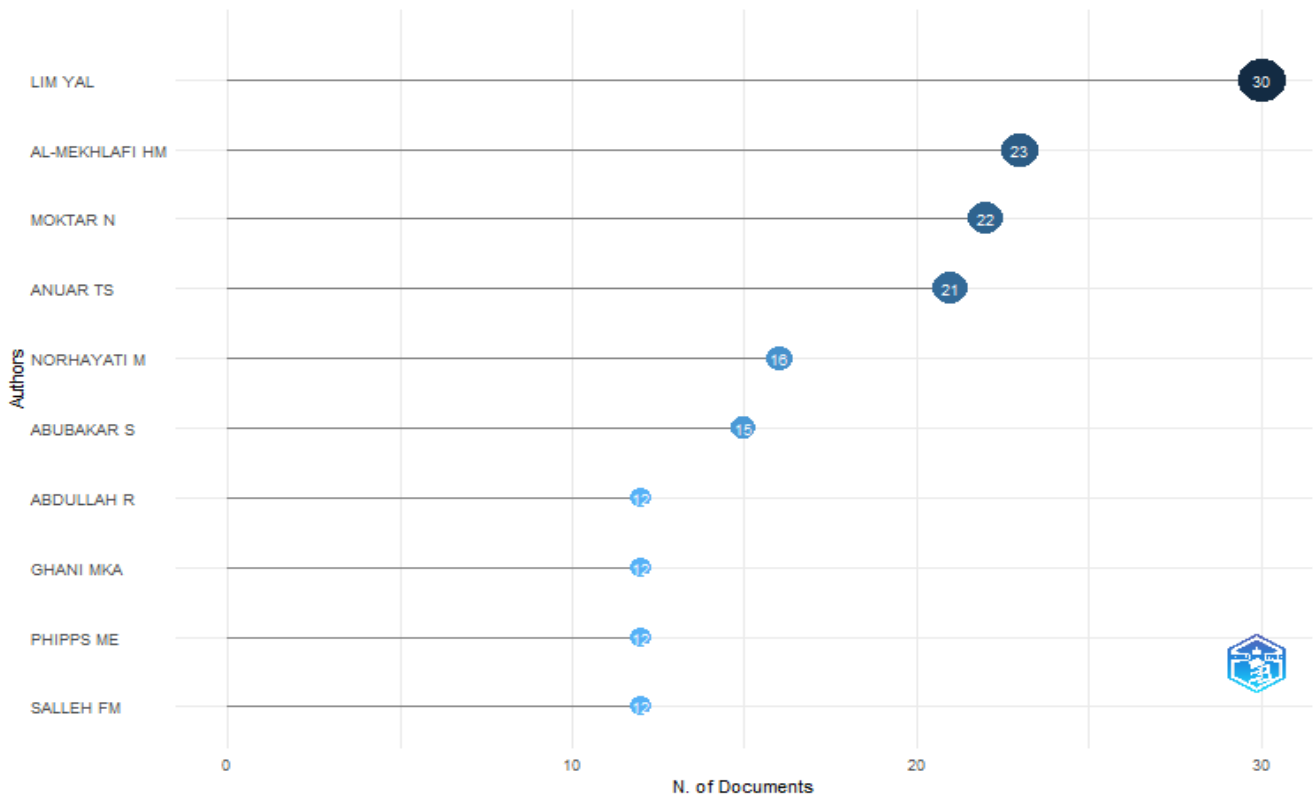


Figure 5: Most Productive Authors
 Source: Data extracted from Biblioshiny (2023)

Table 8: List of the highly cited authors over the time

No	Authors	Year	Total citation (TC)	Total Citation Per Year (TCpY)	No. of articles
1.	Phipps ME	2012	102	7.846	12
2.	Lim YAL	2014	86	7.818	30
3.	Al-Mekhlafi HM	2014	86	7.818	23
4.	Moktar N	2014	86	7.818	22
5.	Anuar TS	2014	86	7.818	21
6.	Norhayati M	2005	83	4.15	16
7.	Lim YAL	2009	68	4.25	30
8.	Al-Mekhlafi HM	2012	66	5.077	23
9.	AbuBakar S	2016	63	7.00	15
10.	Moktar N	2014	61	5.545	22

Source: Data extracted from Biblioshiny (2023)

Most Productive Institution

Figure 6 and Table 8 show the top 10 most productive institutions in terms of total publication. From the extracted data, the University of Malaya led the list by producing 187 articles on orang asli. This is followed by Universiti Kebangsaan Malaysia (148), Universiti Sains Malaysia (83), and Universiti Putra Malaysia (70). There are 474 institutes retrieved that have been involved in studying orang asli.

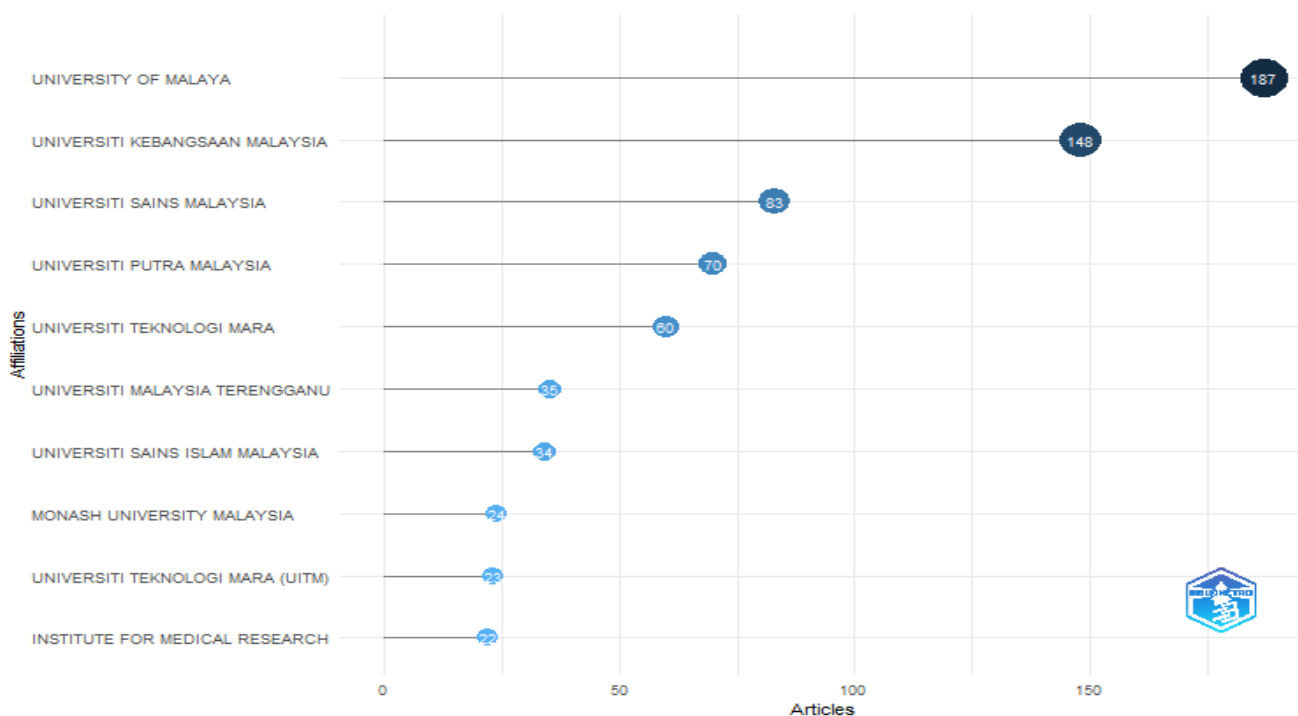


Figure 6: Most Relevant Affiliations
 Source: Data extracted from Biblioshiny (2023)

Table 8: Top Ten Institution wise research output

Affiliation	Articles
University of Malaya (UM)	187
Universiti Kebangsaan Malaysia (UKM)	148
Universiti Sains Malaysia (USM)	83
Universiti Putra Malaysia (UPM)	70
Universiti Teknologi Mara (UiTM)	60
Universiti Malaysia Terengganu (UMT)	35
Universiti Sains Islam Malaysia (USIM)	34
Monash University Malaysia	24
Universiti Teknologi Mara (uitm)	23

Most Frequent Words

The occurrences of words (keywords plus) analysis extracted using Biblioshiny is presented in Figure 7. The frequency of Malaysia (533), female (349), male (341), human (29) and others have been highlighted. Mapping the keywords allows the visualisation of frequency and relationship between keywords by the size of the node, the thickness of the colour font size and the connecting lines. Figure 8 shows the four clusters that have been formed in the orang asli study based on the frequency of keywords. The most frequent words that appear in Figure 8 and Table 9 reflect the topics or content of the articles at a quick glance.

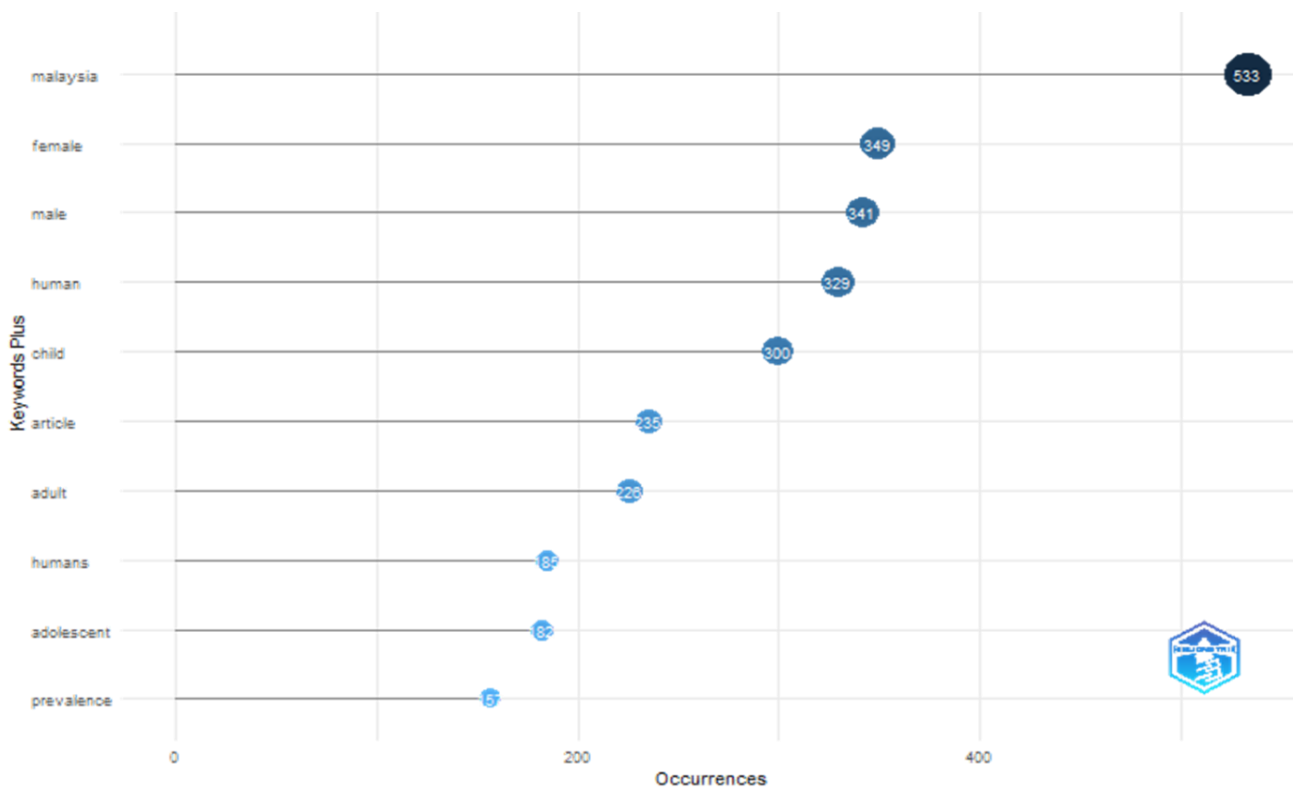


Figure 7: Most Relevant Words
Source: Data extracted from Biblioshiny (2023)

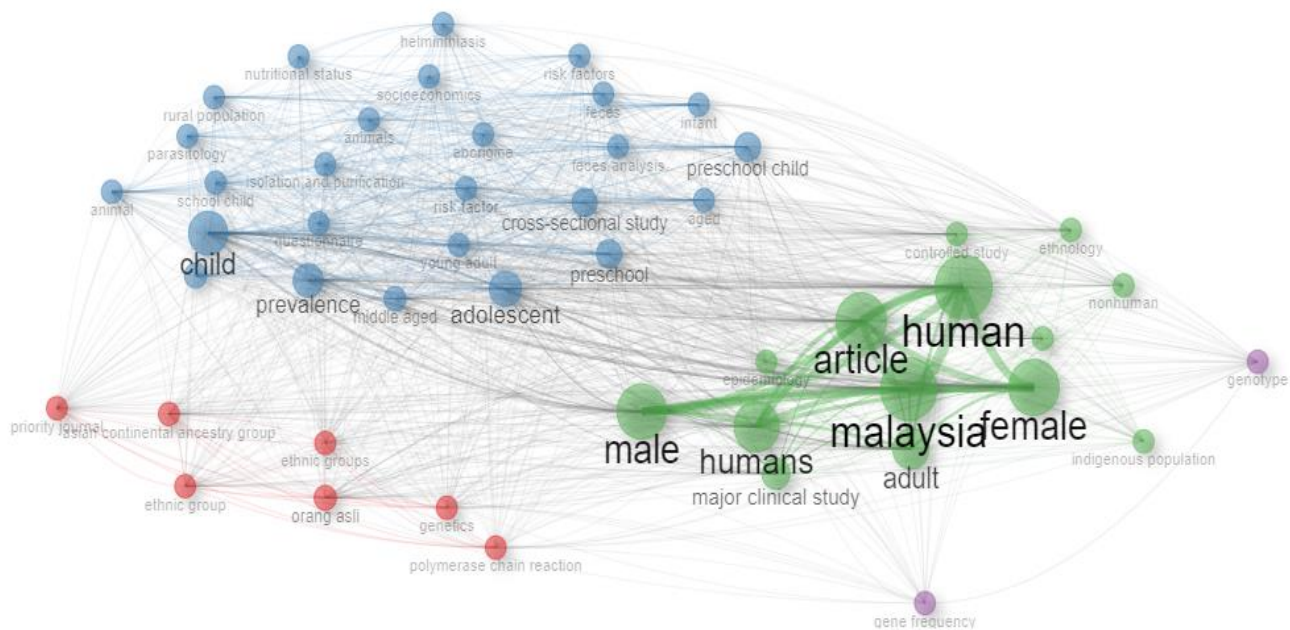


Figure 8: Co-occurrence of the keywords
Source: Data extracted from Biblioshiny (2023)

Table 9: The interpretation of co-occurrence cluster displayed in Figure 8

Cluster	Cluster Frequency	No. of item	Color	Keywords
1 Orang asli and Malaysia	2967	14	green	Malaysia, female, male, human, adult, humans, major clinical study, epidemiology, indigenous population, controlled study, ethnology, non human
2 Orang asli and child	2339	25	blue	Child, adolescent, prevalence, cross sectional study, preschool child, preschool, middle aged, young adult, questionnaire, risk factor feces analysis, annal, school child, isolation and purification, aborigine, infant, feces, animals, animal, parasitology, rural population, socio economics, risk factors, nutritional status, helminthiasis, aged
3 Orang asli and genetic	501	7	red	Priority journal, Asian continental ancestry group, ethnic group, ethnicgroup, orang asli, genetics, polymerase chain reaction
4 Orang asli and rural areas	8	2	purple	Gene frequency, genotype

(Source: Present Study, 2023)

This study aims to review and report the publications on orang asli based on the data collected from the Scopus database. Using the bibliometric approach allows one to identify the hot or interesting topic in research fields, track the history of research on a topic and predict future trends in particular in the research fields (Dervis, 2020).

Based on the result above, the earlier studies on orang asli were initiated in the area of anthropology and health. However, after 50 years, the majority of the studies on orang asli that were published in the Scopus database were grouped under medical and health related topics. It was recorded that as early as 1968, many researchers in Malaysia had a good interest in studying aspects of health and medicines that related to their lifestyle. Since then, their health status has become the topic of study as their poor social and economic development is significantly related to their poor health and lack of access to essential medicine and modern development compared to other populations in Peninsular Malaysia. Various studies have analyzed the factors contributing to the marginalization of the orang asli in Malaysia, offering insights into the social, economic, and structural challenges they face. However, studies on orang asli also occur in the areas of social science as well as art and humanity, environment, economic and agriculture, but many of them were not recorded in the Scopus database. The growth of publication, especially on their health status, has been rather increasing in the early 2000s with the peak number of publications being seen in 2021. This sharp increase in 2021 may be driven by the result of the pandemic COVID-19.

Local institutions such as UM, UKM, USM, UPM and other universities (Figure 6 & Table 8) are the major contributors to orang asli studies. They play an important role in conducting research on orang asli to address the issues and challenges they face and conducting any initiatives to protect this vulnerable population in many aspects. The most frequently used words in the publications on orang asli (Table 9) were found to focus on health with a broad range of themes. "Child" and "rural areas" were widely used to conclude that the research on children was quite extensive in various aspects such as illness, genetics and school.

CONCLUSION

Several limitations to this study warrant acknowledgment. Firstly, the bibliometric analysis covered a single repository - the Scopus database. Hence, it may not retrieve other publications that might be published in other available databases and not indexed in Scopus. This current study also does not cover any grey literature, publications from non-English speaking journals or any publications that are indexed in local journals in Malaysia. Therefore, it is suggested that more analysis should be considered from the other databases or hand search as the future study on orang asli.

Exploring the publication of orang asli research in local journals that are not indexed in the Scopus database will contribute to a more comprehensive understanding of the research landscape and also highlight the significance of localised knowledge production and dissemination. Secondly, the bibliometric approach only provides the numbers of papers and their citations where the numbers represent the quantity of the publications but the citations do not signify the quality of that publication. Despite these limitations, the overall evaluation of this study offers insightful information about the patterns, topics and areas of interest in the orang asli population for the development of future research.

Conflict of Interest

The authors declare no potential conflict of interest relevant to this article was reported.

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