

# Traditional Practitioner's Knowledge of Malay Post-Partum Herbal Remedies in Malaysia

Tengku Azlan Shah Tengku Mohamad<sup>1,2</sup>, Farida Islahudin<sup>1\*</sup>, Malina Jasamai<sup>1</sup>, Jamia Azdina Jamal<sup>1</sup>

<sup>1</sup>Faculty of Pharmacy, University Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia. <sup>2</sup>Faculty of Pharmacy and Health Sciences, University Kuala Lumpur Royal College of Medicine Perak, 30450 Ipoh, Perak, Malaysia.

## Abstract

Herbal remedies are often used in traditional postpartum care among Malay women in Malaysia, closely guided by traditional women practitioners. Due to the diversity of plant species in Malaysia, the use of herbal remedies is often localized and may differ from one place to another. Unfortunately, with the lack of proper documentation, there is a risk of losing information on the practice and common plants used by women traditional practitioners in post-partum management. This work aimed to identify the common plants used in post-partum care among female Malay traditional practitioners in Perak, Malaysia. A researcher-assisted questionnaire of traditional practitioners' knowledge of plants for post-partum remedies was employed. A total of 36 female traditional practitioners were included. There were 139 different plant species used for post-partum management. Leaves were the most common plant part used (n=86, 62.3%). Overall, the most common plants used by the traditional practitioners were fragrant lemongrass (*Cymbopogon nardus* L. Rendle (Poaceae) (n=18, 50%), noni (*Morinda citrifolia*, L. (Rubiaceae) (n=15, 41.7%) and screwpine (*Pandanus amaryllifolius* Roxb. (Pandanaceae) (n=14, 38.9%). External preparations in the form of baths were reported as the most common use (n=78, 44.1%), whilst powders were the most common oral forms (n=57, 32.2%). Clearly, Various plants are used in different preparations of herbal remedies for post-partum care. As such, official documentation of various medicinal plants that are used by traditional practitioners for post-partum care among Malay women is urgently required so as to preserve the traditional knowledge and practice.

**Keywords:** Herb, Traditional, Malay, Practitioner, Post-Partum, Women

## INTRODUCTION

There has been a rise in the use of traditional medicine in recent years and is widely embraced around Asia and the world [1, 2]. Traditional medicine refers to the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, used in the maintenance of health and the prevention, diagnosis, improvement, or treatment of physical and mental illness [1]. In many developing countries, including Malaysia, the community uses traditional medicine, mostly in the form of herbs as folk remedies for the management of acute and chronic illnesses [2]. Women are frequently reported to use herbs more often than men for various health issues, possibly due to their inclination to access healthcare [2]. In Malaysia, herbal remedies are popular among Malay women for post-partum care, which women traditional practitioners are often sort after. However, despite the popular use of plants for post-partum management [3, 4], very little is known regarding the knowledge among women traditional practitioners and Malay post-partum treatment.

Local practitioners' knowledge of traditional medicine and herbal use for Malay women is commonly focused on both indigenous groups [5] and non-indigenous people [6]. However, despite the popularity of herbal use among Malay women for women's health, very often, details of the herbs

used by consumers are lacking [4, 7]. Most concerning is that women's traditional practitioner knowledge has also decreased at an alarming rate [5]. The need to preserve the knowledge of herbal use for traditional medicine is vital due to the important role of plants in the discovery of bioactive agents in modern medicine [8]. In addition to this, the need to identify plants used by traditional practitioners is important to optimize safety and efficacy. Despite the perceived safety of herbal medicine, many studies have reported unwarranted adverse effects with traditional medicine [9]. This is concerning as various herbal remedies are often recommended by practitioners for post-partum care [7].

**Address for correspondence:** Farida Islahudin, Faculty of Pharmacy, University Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia.  
faridaislahudin@yahoo.com

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non commercially, as long as the author is credited and the new creations are licensed under the identical terms.

**How to cite this article:** Mohamad TAST, Islahudin F, Jasamai M, Jamal JA. Traditional Practitioner's Knowledge of Malay Post-Partum Herbal Remedies in Malaysia. Arch Pharm Pract. 2022;13(2):11-6. <https://doi.org/10.51847/ani1usVKCV>

Despite their knowledge of herbal remedies, many practitioners may not be aware of the potential adverse effects on women and their children when recommending the herbs [9]. Thus, close monitoring of herbal remedies recommended by traditional practitioners, especially among women is required to reduce the incidence of adverse side effects, and drug-herb interactions and to optimize efficacy.

Among Malay women, herbal remedies are used frequently after childbirth due to their perceived natural and safer origins [3, 7]. Herbal remedies are also thought to be easily accessible and cheaper than conventional medicines [2]. Given the vast rainforests in Malaysia, a diverse number of plants exist, many unexplored and potentially useful as medicinal sources. In view of this diversity, the use of post-partum herbal remedies among Malay women is reported to differ from one state to another [7]. The distinct variances could be largely due to differences in the availability of plants [4]. Most often, the use of multiple herbs is recommended for one indication, either as a herbal drink, to be taken orally, or used as a bath mixture [2, 7]. It is interesting to note that at times, one herb is used by various practitioners for the same indication, as observed for post-partum care, prompting the possibility of its effectiveness and efficacy in solving the target issue [7].

There is a need to document the uses of these herbs to ensure the preservation of traditional medicine practice, especially among women. Documenting the different plants used could also provide valuable clues in the search for improved safe use of herbal remedies. With rapid modernization and development of rural areas occurring globally, there is a serious threat to medicinal plant diversity. Changes to traditional lifestyles can further threaten the continuity of familiarity with traditional medicine knowledge. This is especially a challenge as practitioners rarely document the use of different plant types and their parts and amount in herbal preparations. Therefore, this work aimed to identify common post-partum herbal remedies used among Malay women traditional practitioners in Perak, Malaysia, in an attempt to preserve their knowledge.

## MATERIALS AND METHODS

A cross-sectional study was performed among female traditional practitioners in Perak. At least one practitioner from each district was selected. The inclusion criteria of traditional practitioners were recognized as a traditional healer in the village or known to utilize medicinal plants for self-treatment or the family, must possess knowledge of the uses of medicinal plants, and must be mentioned at least by three villagers. Those that did not complete the interview were excluded from the study. Both purposive and snowball sampling approaches were utilized in the selection of practitioners. Oral informed consent was obtained before inclusion in the study.

Perak is a state that is situated in the north-central region of Peninsular Malaysia. It is divided into eleven districts: Hulu

Perak, Kerian, Larut Matang and Selama, Bagan Datuk, Perak Tengah, Hilir Perak, Kuala Kangsar, Muallim, Kampar, Batang Padang and Manjung [10, 11]. It has a land area of 2.1 million hectares, with approximately half or equivalent to 998,306.02 hectares of which being forest area [10-12].

Data was collected using a researcher-assisted questionnaire. The data collection was performed using a questionnaire adapted from previous work [13], which was divided into three parts, A, B and C. Part A consisted of demographic data of the practitioner such as age, income, location, and level of education, category of practice, duration of practice and occupation. Part B includes data on sources of knowledge, efforts to preserve or disseminate knowledge, and methods of preservation of traditional practice. Respondents were also asked whether they were well versed in taxonomy or pharmacognosy, processing techniques or quality control methods with regards to the plants used, methods of gathering plants, and availability [13, 14]. In Part C, details of the most common plants used for managing women post-partum were collected. This was followed by details of the plants used for herbal remedies such as; the vernacular name of the plant, part of the plants used, its medicinal uses, and methods of preparation [13, 14].

Analysis of data was performed using SPSS Statistics for Windows, version 24 (IBM Corp., Armonk, N.Y., USA). All data were divided into categories and presented as frequency and percentages. Continuous data such as age and income were presented as mean and standard deviations (SD).

## RESULTS AND DISCUSSION

A total of 36 female practitioners were included in the study. Approximately half of the practitioners (n=19, 52.7%) had other jobs, of which 1 (2.8%) was a rubber tapper and homesteader, respectively, 8 (22.2%) practitioners were also petty traders and 9 (25%) were traditional massage therapists. Of the 36 practitioners, 10 (27.8%) were plant collectors/sellers and the remaining 26 (72.2%) were healers. Details of the traditional practitioners are shown in (Table 1).

A total of 10 (27.8%) practitioners revealed that they obtained knowledge of medicines via inspirations and dreams. The remaining 26 (72.2%) received the knowledge of plant use for post-partum herbal remedies via friends and relatives. Details of traditional practitioners' sources of knowledge are shown in (Table 2).

A total of 138 plants based on Malay plant names were used for post-partum care. However, on closer inspection, 138 different Malay plants represented 126 scientific names. The families of medicinal plants species used for post-partum care were mostly Zingiberaceae (n=20), Lamiaceae (n=11), and Acanthaceae (n=8) (Figure 1).

The most common plant part used were leaves (n=86, 62.3%),

followed by roots (n=29, 21.0%), rhizomes (n=15, 10.9%), seeds (n=12, 8.7%), fruits (n=11, 8.0%), whole plants (n=8, 5.8%), flowers (n=5, 3.6%), barks (n=5, 3.6%), bulbs (n=2, 1.4%) and tubers (n=1, 0.7%).

The 20 most common plants are reported in (Table 3). Of the total 36 practitioners, the most common plant used among them were fragrant lemongrass 'serai wangi' (*Cymbopogon nardus*) (n=18, 50%), noni 'mengkudu' (*Morinda citrifolia* L.) (n=15, 41.7%) and screwpine 'pandan' (*Pandanus amaryllifolius*, Roxb.) (n=14, 38.9%). From the 20 most common plants used, most were in the form of leaves (n=14, 70%), followed by fruits (n=3, 15%), seeds (n=2, 10%) and rhizomes (n=1, 5%). The plants were used in either external or oral form.

External preparations reported were in the form of baths, steam baths, massage oils, and powders. Baths are prepared by boiling herbs in water for a few minutes, and cold water was added before being used for bathing. Steamed baths are herbs added into boiling water, and the steam used for a steam bath. Massage oils are coconut oils infused with herbs that are used for body massages. Powders are herbs that are dried and crushed into fine powder to be used on the body, giving a warm sensation. It was reported that the most common use of the plants in external form was baths (n=78, 44.1%).

Internal preparations included maajun, boiled drinks, powder, juice, and raw herbs. Maajun is a preparation of rolling dry herbs into a small ball-like form and it is then taken orally, either swallowed whole or chewed. Boiled drinks are herbs that are boiled and simmered for a few minutes and ingested while warm. Powders are dried herbs that are crushed fine, mixed into boiling water, and taken with or without sugar. Herbal juices are preparations that are added with fruit juice and water. Raw herbs are herbs in their natural form and are usually taken with meals, very much like ingesting salads. The most common type of internal form used for post-partum use were powders in oral form (n=57, 32.2%).

**Table 1.** Characteristics of the traditional practitioners (n=36)

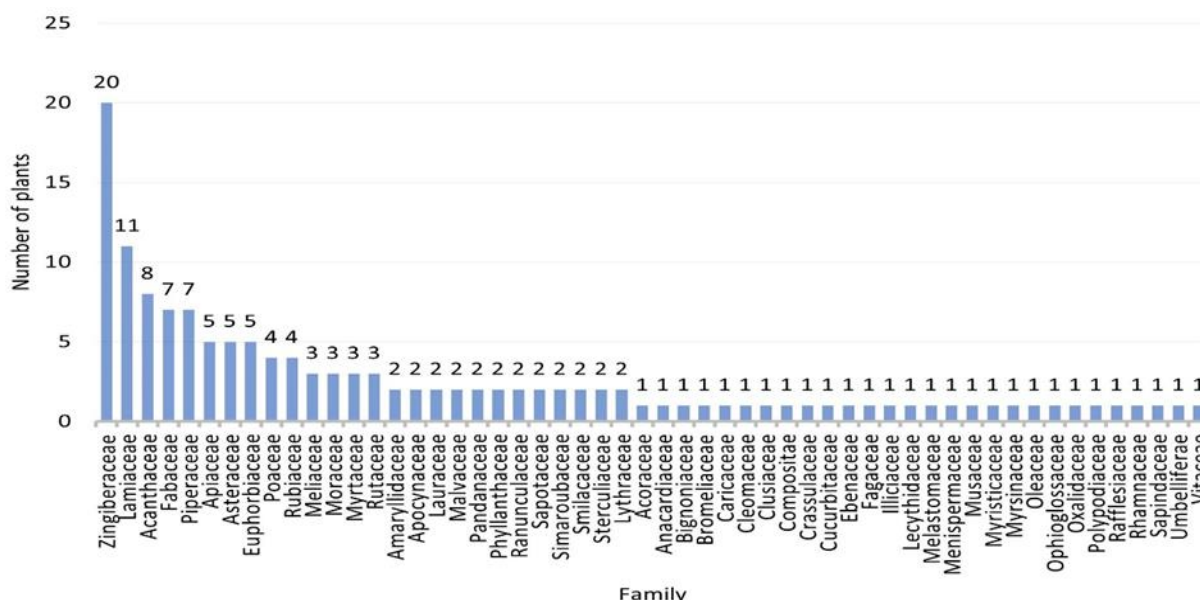
Characteristics	n/ mean±SD	%/range
Age	64.3±12.9	33-83
Income/month	12000±15716	1000-30000
Refused to disclose	32	88.9
<b>Number of practitioners interviewed in each district</b>		
Bagan Datuk	3	8.3
Batang Padang	2	5.6
Hilir Perak	2	5.6
Hulu Perak	2	5.6
Kampar	5	13.9
Kerian	6	16.7
Kinta	1	2.8
Kuala Kangsar	1	2.8
Larut, Matang dan Selama	4	11.1
Manjung	1	2.8

Muallim Perak Tengah	7	19.4
<b>Level of education</b>		
None	6	16.7
Primary	22	61.1
Secondary	8	22.2
Tertiary	0	0
<b>Duration of practice (years)</b>	32.5±16.6	4-64

**Table 2.** Details of knowledge of the traditional practitioners (n=36)

Details of knowledge	n	%
<b>The effort to preserve or disseminate the knowledge</b>		
No	31	86.1
Yes	5	13.9
<b>Method of preservation of the knowledge</b>		
Recorded by the children that learn the knowledge	1	2.7
Written as a log of medicinal recipes	1	2.7
Only a few selected were recorded in a book	1	2.7
Written in a book	1	2.7
Used to write in a book, but lost the book	1	2.7
<b>Knowledge of taxonomic botany or pharmacognosy</b>		
No	36	100.0
Yes	0	0
<b>Knowledge of processing techniques of medicines</b>		
No	34	94.4
Yes	2	5.6
<b>Knowledge of quality control methods of herbal products</b>		
No	35	97.2
Yes	1	2.8

Post-partum care is essential among Malay women, with many opting for herbal remedies during this time to optimize their health [15, 16]. During this post-partum period, many Asian mothers go through a period termed 'confinement' [3, 15], which may last between a few weeks to a little more than a month, often guided by a women's traditional practitioner. During this period, the mother is required to go through a strict diet, extended rest, and many opt for herbal remedies. The lack of modern medicines available for post-partum care makes this a lucrative area for traditional practitioners in Malaysia, as new mothers look for alternative remedies to facilitate recuperation during the confinement period. Herbal remedies for post-partum care are thought to accelerate the recovery process [15]. Various herbs are used by mothers for post-partum care [16]. However, they are often uncertain of what is taken as practitioners very rarely divulge the contents of their remedies. This is not surprising, as evidently, many traditional practitioners admit that they do not document or disseminate their knowledge. This lack of documentation [17, 18] has become increasingly worrying as preservation of traditional medicinal practice becomes more limited. Safeguarding knowledge of Malay traditional practice in post-partum care is indeed warranted.



**Figure 1.** Families of the medicinal plant species used for post-partum care (n=138)

**Table 3.** Plant species, parts, and forms used for post-partum care among traditional practitioners (n=36)

Plant species	Parts	External preparation				Internal preparation				
		bath	steam bath	massage oil	external powder	maajun	boiled drinks	oral powder	juice	raw herbs
<i>Cymbopogon nardus</i>	Leaves	14	3	2	-	1	1	2	-	-
<i>Morinda citrifolia</i>	Leaves	10	1	1	-	1	1	3	-	1
<i>Pandanus amaryllifolius</i>	Leaves	13	2	-	-	-	-	-	-	-
<i>Kaemferia galangal</i>	Leaves	1	1	-	2	2	6	5	-	-
<i>Alpinia galangal</i>	Leaves	9	-	-	-	-	2	-	-	-
<i>Flemingia strobilifera</i>	Leaves	10	2	-	-	1	-	1	-	-
<i>Quercus infectoria</i>	Fruit	1	-	-	-	2	4	5	1	1
<i>Lawsonia inermis</i>	Leaves	6	2	-	-	-	1	1	-	-
<i>Acorus calamus</i>	Leaves	3	-	-	1	2	1	4	-	-
<i>Piper retrofractum</i>	Fruit	-	-	-	2	3	1	6	-	-
<i>Piper nigrum</i>	Leaves	-	-	-	1	2	1	6	-	-
<i>Cuminum cyminum</i>	Seed	-	-	-	1	2	2	5	-	-
<i>Pimpinella anisum</i>	Seed	-	-	-	1	2	2	4	-	-
<i>Curcuma xanthorrhiza</i>	Leaves	1	1	-	1	1	2	3	-	-
<i>Helicteres isora</i>	Fruit	-	-	-	-	1	-	4	-	-
<i>Blumea balsamifera</i>	Leaves	4	-	-	-	-	1	-	-	-
<i>Zingiber officinale</i>	Rhizomes	-	1	-	-	-	3	2	-	-
<i>Labisia pumila</i> var. <i>alata</i>	Leaves	1	-	-	-	-	3	1	-	-
<i>Curcuma longa</i>	Leaves	2	1	-	1	1	2	4	1	-
<i>Clerodendrum serratum</i>	Leaves	3	1	1	-	1	-	1	-	-

Malaysia has been advocating for the documentation of herbal remedies with the publication of the Malaysian Herbal

Monograph [19]. Since 1999, three volumes of the Malaysian Herbal Monograph have been published (i.e. Malaysia Herbal

Monograph 1999; Malaysia Herbal Monograph 2009; Malaysia Herbal Monograph 2013) [20-22] the latest Malaysia Herbal Monograph in 2015 has over 69 medicinal plants investigated [19]. Other publications on Malay medicinal plants are also widely available such as Ridley (1907) [23], Gimlette (1913, 1971) [24, 25], Gimlette and Burkill (1930) [26], Gimlette and Thomson (1939) [27], and Burkill (1935, 1966) [28, 29], all of which predates the Malaysian Herbal Monographs. Interestingly, not all reported plants used in the current work are found in the Malaysia Herbal Monograph. The need to update the information on Malay traditional practices is thus evident, especially due to the lack of official reporting from the traditional practitioners themselves. At present, the most recent work on such practice has been performed in Pahang, Negeri Sembilan, and Johor [3, 4], albeit to the best of our knowledge this is the first from Perak.

Baths and steam baths are often recommended to women under confinement as it is traditionally used to keep them clean, invigorated, and remove bad odors [15]. The need to retain strict hygiene among women during confinement periods has often been reported [15]. In this instance, traditional practitioners soak the leaves in boiling water which is then added to baths or used as a steam bath. *C. nardus*, *M. citrifolia*, *F. strobilifera*, and *P. amaryllifolius* Roxb., are fragrant plants, with essential oils often used in bath and body products such as shower gels and soap. Studies have also shown that the essential oils of *M. citrifolia*, *F. strobilifera*, and *C. nardus* have antibacterial and antifungal properties [30-32], further supporting the benefits of the clean and invigorating herbal remedies used in post-partum traditional practice. On the other hand, despite the popularity of the fragrant *P. amaryllifolius* Roxb. use in Malaysia, as either a flavoring in local cuisine or a natural air freshener, little is known with regards to its benefits and medicinal properties in post-partum care, prompting the need for further research.

Among oral preparations, the current work reports both *K. galangal* L. and *Q. infectoria* G. Oliver to be most frequently used for post-partum care as a drink, either by boiling the raw herbs or mixing pre-prepared powders into hot water. *K. galangal* L., aromatic ginger, is touted for its medicinal properties, among them, reducing bloating, stomach ache, and swelling. Interestingly anti-inflammatory and analgesic pharmacological properties are well-documented for *K. galangal* L., reducing inflammation *in vitro* [31-34], which is comparable to its traditional purpose. Its analgesic effects are also demonstrated to be comparable to aspirin [31]. *In vitro* pharmacological activity of *K. galangal*, L is mainly through its active constituent ethyl p-methoxycinnamate [33, 34]. On the other hand, *Q. infectoria* G. Oliver is recommended by traditional practitioners to reduce swelling of the uterine after childbirth as well as to prevent vaginal discharge and rashes [33]. The *in vitro* anti-inflammatory [33] and antimicrobial properties of *Q. infectoria* G. Oliver [35-37], has also been

documented and may support its use to reduce swelling and prevent rashes.

To that end, despite the common use of *F. strobilifera* and *P. amaryllifolius* Roxb., as herbal remedies in post-partum care [38], to this date, no quality specifications of the common contents of these herbs are found in the Malaysian Herbal Monograph (2015). The need to start documenting information about these plants is vital as there is a large gap in the current knowledge of herbal remedies used in the herbal industry. The current work thus provides additional information on the common herbs used among Malay traditional practitioners for post-partum care and further strengthens the need to rapidly document the various plant species available for use in the herbal industry

## CONCLUSION

Malaysia is home to a vast array of plant species, many of which are used in traditional medicine. The need to document the uses of the plants in herbal remedies is currently supported by the government in an attempt to safeguard the traditional practice of medicine, as well as ensure the safe use of herbs. This is essential as many plants are used without appropriate knowledge of their benefits, undermining efforts to promote the safe use of traditional medicine. Although various plants were identified in post-partum use, a few plants were more frequently recommended than others, further strengthening the need to continue identifying the different herbs used in the herbal industry for the management of women's health.

**ACKNOWLEDGMENTS:** None

**CONFLICT OF INTEREST:** None

**FINANCIAL SUPPORT:** None

**ETHICS STATEMENT:** The study was approved by the Universiti Kebangsaan Malaysia Research Ethics Committee (JEP-2018-522).

## REFERENCES

1. World Health Organization (WHO). General guidelines for methodologies on research and evaluation of traditional medicine. World Health Organization, Geneva, 2000.
2. Peltzer K, Pengpid S. Prevalence and determinants of traditional, complementary and alternative medicine provider use among adults from 32 countries. *Chin J Integr Med.* 2018;24(8):584-90.
3. Jamal JA, Ghafar ZA, Husain K. Medicinal Plants used for Postnatal Care in Malay Traditional Medicine in the Peninsular Malaysia. *Pharmacogn J.* 2011;3(24):15-24.
4. Nordin MS, Zakaria NH. Plants used for medicines by the indigenous Malay of Pahang, Malaysia. *Med Plants.* 2016;8(2):142-50.
5. Berkes F, Colding J, Folke C. Rediscovery of traditional ecological knowledge as adaptive management. *Ecol Appl.* 2000;10(5):1251-62.
6. Gómez-Baggethun E, Mingorría S, Reyes-García V, Calvet L, Montes C. Traditional ecological knowledge trends in the transition to a market economy: Empirical study in the Doñana natural areas. *Conserv Biol.* 2010;24(3):721-9.
7. Mohamad TAST, Islahudin F, Jasamai M, Jamal JA. Preference, perception and predictors of herbal medicine use among Malay women in Malaysia. *Patient Prefer Adherence.* 2019;13:1829-37.
8. Fabricant DS, Farnsworth NR. The value of plants used in traditional medicine for drug discovery. *Environ Health Perspect.* 2001;109(Suppl.1):69-75.

9. Valli G, Giardina EGV. Benefits, adverse effects and drug interactions of herbal therapies with cardiovascular effects. *J Am Coll Cardiol.* 2002;39(7):1083-95.
10. Perak State Government, *Buku Data Asas Negeri Perak 2016*. Available from: [https://www.perak.gov.my/images/menu\\_utama/ms/kerajaan\\_negeri/d\\_ata\\_asas\\_2016.pdf](https://www.perak.gov.my/images/menu_utama/ms/kerajaan_negeri/d_ata_asas_2016.pdf). Accessed: 27-Jul-2019.
11. Perak State Secretary Office, *Perak State Secretary Report 2017*. 2017. Available from: [https://www.perak.gov.my/images/menu\\_utama/ms/rakyat/penerbitan/laporan\\_tahunan/lap2017.pdf](https://www.perak.gov.my/images/menu_utama/ms/rakyat/penerbitan/laporan_tahunan/lap2017.pdf). Accessed: 25-Jul-2019.
12. SIRIM, Public summary of first surveillance audit (3rd cycle) on Perak forest management unit for forest management certification. 2017. Available from: <http://www.sirim-qas.com.my/sirim/core-files/uploads/2017/09/Public-Summary-FMC-of-Perak-Forest-Management-Unit-1st-Surveillance-Audit-3rd-Cycle-2016.pdf>. Accessed: 26-Feb-2019.
13. Elisabetsky E, Trajber R, Ming LC. Appendix: Manual for plant collections in Balick MJ, Elisabetsky E, Laird SA, eds. *Medicinal Resources of the Tropical Forest: Biodiversity and its Importance to Human Health*. New York: Columbia University Press, 1996.
14. Kankara SS, Ibrahim MH, Mustafa M, Go R. Ethnobotanical survey of medicinal plants used for traditional maternal healthcare in Katsina state, Nigeria. *South African J Bot.* 2015;97:165-75.
15. Fok D, Aris IM, Ho J, Lim SB, Chua MC, Pang WW, et al. A comparison of practices during the confinement period among Chinese, Malay, and Indian mothers in Singapore. *Birth.* 2016;43(3):247-54.
16. Fadzil F, Shamsuddin K, Wan Puteh SE. Traditional postpartum practices among Malaysian mothers: a review. *J Altern Complement Med.* 2016;22(7):503-8.
17. Jamal JA. Malay traditional medicine: an overview of scientific and technological progress. *Tech Monit.* 2006;1:37-49.
18. Ramli MR, Milow P, Chooi OH. Traditional knowledge of a practitioner in medicinal plants of Masjid Ijok village, Perak, Malaysia. *Stud Ethno-Med.* 2015;9(1):59-66.
19. Malaysia Herbal Monograph Committee, *Malaysian Herbal Monograph 2015*. Kuala Lumpur: Institute for Medical Research, 2015.
20. Malaysian Herbal Monograph Committee, *Malaysian Herbal Monograph, Volume 1*. Forest Research Institute Malaysia, 1999.
21. Malaysian Herbal Monograph Committee, *Malaysian Herbal Monograph, Volume 2*. Forest Research Institute Malaysia, 2009.
22. Malaysian Herbal Monograph Committee, *Malaysia Herbal Monograph, Volume 3*. Forest Research Institute Malaysia, 2013.
23. Ridley HN. *Materials for a Flora of the Malayan Peninsula*. Singapore: Singapore: Methodist Publishing House, 1907.
24. Gimlette JD. *Some Superstitious Beliefs Occurring in the Theory and Practice of Malay Medicine*. Singapore: American Mission Press, 1913.
25. Gimlette JD. *Malay Poisons and Charm Cures*. New York: Oxford University Press, 1971.
26. Burkill IH, Gimlette JD. *The Medical Book of Malayan Medicine*. Singapore: Botanic Gardens, 1930.
27. Gimlette JD, Thomson HW. *A Dictionary of Malay Medicine*. London: Oxford University Press, 1939.
28. Burkill IH. *A Dictionary of the Economic Products of the Malay Peninsula*. London: Crown Agents, 1935.
29. Burkill IH. *A Dictionary of the Economic Products of the Malay Peninsula*. Kuala Lumpur: Ministry of Agriculture and Co-operatives, 1966.
30. Jayaraman SK, Manoharan MS, Illanchezian S. Antibacterial, antifungal and tumor cell suppression potential of *Morinda citrifolia* fruit extracts. *Int J Integr Biol.* 2008;3(1):44-9.
31. Das G, Patra JK, Gonçalves S, Romano A, Gutiérrez-Grijalva EP, Heredia JB, et al. Galangal, the multipotent super spices: A comprehensive review. *Trends Food Sci Technol.* 2020;101:50-62.
32. Rachkeeree A, Kantadoung K, Suksathan R, Puangpradab R, Page PA, Sommano SR. Nutritional compositions and phytochemical properties of the edible flowers from selected Zingiberaceae found in Thailand. *Front Nutr.* 2018;5:3.
33. Aroonrerk N, Kamkaen N. Anti-inflammatory activity of *Quercus infectoria*, *Glycyrrhiza uralensis*, *Kaempferia galanga* and *Coptis chinensis*, the main components of Thai herbal remedies for aphthous ulcer. *J Health Res.* 2009;23(1):17-22.
34. Umar MI, Asmawi MZ, Sadikun A, Altaf R, Iqbal MA. Phytochemistry and medicinal properties of *Kaempferia galanga* L. (Zingiberaceae) extracts. *Afr J Pharm Pharmacol.* 2011;5(14):1638-47.
35. Basri DF, Tan LS, Shafiei Z, Zin NM. In vitro antibacterial activity of galls of *Quercus infectoria* Olivier against oral pathogens. *Evid based Complementary Altern Med.* 2012;2012:632796. doi:10.1155/2012/632796
36. Hamad HO, Alma MH, Gulcin İ, Yılmaz MA, Karaoğul E. Evaluation of phenolic contents and bioactivity of root and nutgall extracts from Iraqi *Quercus infectoria* Olivier. *Rec Nat Prod.* 2017;11(2):205-10.
37. Ahmed AA, Salih FA. *Quercus infectoria* gall extracts reduce quorum sensing-controlled virulence factors production and biofilm formation in *Pseudomonas aeruginosa* recovered from burn wounds. *BMC Complement Altern Med.* 2019;19(1):1-1.
38. Sibeko L, Johns T, Cordeiro LS. Traditional plant use during lactation and postpartum recovery: Infant development and maternal health roles. *J Ethnopharmacol.* 2021;279:114377.