

Systematic Literature Review on *Centella Asiatica*

Sorotan Literatur Sistemik terhadap *Centella Asiatica*

Tg Ainul Farha Binti Tg Abdul Rahman¹, Nurdalila A'wani Abd Aziz², Nurhanini Nahnul Muna Binti Yusof³, Balqis Batrisyia Binti Hadizam⁴ & Adel Rahman Ibrahim Suleiman Islieh⁵

^{1,2,3,4,5}Kolej GENIUS Insan, Universiti Sains Islam Malaysia (USIM)

Article progress

Accepted: 03 Mac 2020

Reviewed: 14 April 2020

Published: 31 Mei 2020

*Corresponding author:

Nurdalila A'wani Abd Aziz,

Kolej GENIUS Insan,

Universiti Sains Islam

Malaysia (USIM)

Emel:

nurdalila.awani@usim.edu.my

Abstract: The theory of the usage of *Centella Asiatica* in medicine among the Malay community has been practiced for a long time. It is a traditional medicine passed down through generations. Over 40 studies used *Centella Asiatica* among the Malay community. Research conducted to qualify for an academic certificate, articles published in journals, or seminar papers. This qualitative study aims to explore the literature review of *Centella Asiatica* among the Malay community through document analysis and the matrix of Systematic Literature Review (SLR). In doing so, a systematic analysis is conducted on the background, issues, or gap about this study as well as methodology and findings on previous research. This study has found that the study of *Centella Asiatica* among the Malay community was popular in Sabah, Perak, Selangor, and Terengganu, especially on the major works written by Malay scholars and the qualitative study using content analysis technique, was the most preferred method chosen by these researchers. The studies on *Centella Asiatica* among the Malay community should be continued and developed to explore both the obvious and the underlying reasons behind its usage among scholars of *Centella Asiatica* in the Malay community.

Keywords: *Centella Asiatica*, traditional medical, Malay community, Systematic Literature Review (SLR)

Abstrak: Teori penggunaan *Centella Asiatica* dalam perubatan dalam kalangan masyarakat Melayu telah lama diamalkan. Ini adalah ubat tradisional yang diturunkan turun-temurun. Lebih 40 kajian menggunakan *Centella asiatica* dalam kalangan masyarakat Melayu dilakukan untuk memenuhi syarat bagi memperoleh sijil akademik, artikel yang diterbitkan dalam jurnal atau makalah seminar. Kajian kualitatif ini bertujuan untuk meneroka sorotan literatur *Centella asiatica* dalam kalangan masyarakat Melayu melalui analisis dokumen dan matriks Sorotan Literatur Sistemik (SLR). Analisis sistematik dilakukan terhadap latar belakang, masalah atau jurang yang berkaitan dengan kajian ini serta metodologi dan penemuan pada penyelidikan sebelumnya. Kajian ini mendapati kajian *Centella asiatica* dalam kalangan masyarakat Melayu sangat popular di Sabah, Perak, Selangor dan Terengganu terutama pada karya utama yang ditulis oleh sarjana Melayu dan kajian kualitatif yang menggunakan teknik analisis kandungan adalah kaedah yang paling disukai oleh para penyelidik ini. Kajian mengenai *Centella asiatica* di kalangan masyarakat Melayu harus diteruskan dan dikembangkan untuk meneroka sebab-sebab yang jelas dan mendasar di sebalik penggunaannya dalam kalangan sarjana *Centella asiatica* dalam masyarakat Melayu.

Kata kunci: *Centella asiatica*, perubatan tradisional, masyarakat Melayu, Kajian Literatur Sistemik (SLR)

Introduction

Malaysia is one of the countries that have a high diversity of plants. Some plants have medicinal properties and have been used as a traditional treatment based on hereditary skills that are still used until now. Besides that, Malaysia is not only has rich biodiversity and ecosystems, but also ethnic diversity with different and unique traditional and cultural knowledge. Besides, several factors underlie people using traditional medicinal herbs:

- a) In general, the price of factory medicines is very expensive, therefore people are looking for cheaper alternative treatments.
- b) Side effects caused by traditional medicine are small compared to modern medicine.
- c) The content of chemical elements contained in traditional medicine become the basis of modern medicine.

Knowledge of traditional medicine is inherited by the community through generations from the ancestors. The current generation is less motivated to explore knowledge from the older generation and gradually began to be abandoned due to several factors. Traditional heritage and traditions will gradually die out. At present, the problem has begun to be overcome by the practice of local knowledge and people's understanding of medicinal plants is increasing. People are starting to understand the use of plants for medicine can complement modern treatment. The use of the medicinal plant is often the first choice for treatment. Medicinal plants are types of plants that are known to have good efficacy in helping maintain health and medication during illness. Medicinal plants are very closely related to traditional treatments because the utilization of the medicinal plant is not based on clinical laboratory testing, but rather on the experience of use. Therefore, an effort to document the traditional medical knowledge needs to be done to go hand in hand with the conservation of medicinal plants for knowledge, conservation, and welfare of the community.

Centella Asiatica is one of the most commonly used medicinal plants in Malaysia. *Centella Asiatica* (Linn.) belongs to the plant family *Apiaceae* (Umbelliferae), an important plant with a wide range of traditional, medicinal and therapeutic values (Zahara et. al., 2014). This herb is found almost all over the world

and is utilized as a source of food, beverage, and medicine. *Centella Asiatica* has been known for many years in treating wounds. The herb is also known as *pegaga* in Malaysia, Indian pennywort and *gotu kola* in Europe and America, *mandookaparni* in India, *pegagan* or *kaki kuda* in Indonesia, *luei gong gen* or *tung chaim* in China. Besides being used as traditional and alternative medicine, *Centella Asiatica* is commonly used in this country as a vegetable and drinks like for tea or juice. It flourishes abundantly in moist areas and is a small, herbaceous annual plant of the sub-family *Mackinlaya*, previously included in *Hydrocotyle*, occurring in swampy areas of Malaysia (James & Dubery, 2009). For many years, *Centella Asiatica*, also known as *pegagan* in Indonesia, is widely used in folk medicine to treat a wide range of illnesses. One of the popular uses of *Centella Asiatica* aside from its detoxifying action is its potential in wound healing properties (Seevaratnam et. al., 2012) and it is widely used as a blood purifier also known as improving blood circulation as well as for treating high blood pressure (Gohil et al. 2010).

Research Design On *Centella Asiatica* Among The Malay Community

Table 1 presents a Systematic Literature Review covering the year of study, background, issues, methodologies, and previous findings related to the study of *Centella Asiatica* among the Malay community. It shows the distribution and appeal of this study across the Malay community. The principle of Systematic Literature Review (SLR) has been followed by many modern researchers to see the phenomenon that occurs. In this study, the keywords of "*Centella Asiatica* among the Malay community" was used to obtain research data. The search engine that is used is Google Scholar. The scope of the search is from 1991 to the year 2018. Out of the 40 documents of the study of the *Centella Asiatica* among the Malay community obtained, only 30 documents were accepted for analysis because the remaining 10 documents discussed *Centella Asiatica* in other fields and other branches of study.

Table 1: Systematic Literature Review On *Centella Asiatica* Among The Malay Community

Research	Background	Issue	Methodology	Previous Finding
Adnan, N. & Othman, N., 2012.	The interrelationship between plants and Malay culture analysis.	Identify common plants in an urban environment.	Qualitative Content Analysis	Botany plant availability and space constraint in Kampong Bahru.
Fadzilah et.	Preliminary ethnobotanical	Properly document the	Qualitative	Ethnobotanical of traditional

al, 2002	survey.	traditional vegetable.	Content Analysis	salad food (ulam) in Kampung Taun Gusi, Kota Belud, Sabah.
Jamal, J.A., 2006	Principal practices and status of scientific research and development.	Study on how traditional preparation has been transformed through research.	Quantitative Content Analysis	Overview of scientific and technological progress.
Lee, Y.Y., et. al, 2011	Prevalence of Helicobacter pylori infection.	Compare environmental factors that differ to H.pylori.	Quantitative Content Analysis	Identification variable analysis.
Bachok, M.F., 2014	Modulating blood glucose level.	Systematically evaluate the effectiveness of <i>ulam</i> .	Qualitative Content Analysis	Blood glucose level modulated by traditional Malaysian vegetables (ulam).
Ahmad, N.I., et. al, 2012	Different ethnicities of Malaysian adults in residing Selangor.	The pattern of fruits and vegetable consumption.	Qualitative Content Analysis	Consumption of fruits and vegetables among adults.
Khatun, M.A., 2011	The traditional medicinal system in Malaysia.	The use of eight medicinal plants in the traditional medicinal system of Malaysia.	Qualitative Content Analysis	Scientific validation of eight medicinal plants.
Samuel et. al, 2010	Qualitative ethnomedical survey.	Evaluate the potential medicinal uses of local plants.	Qualitative Content Analysis	Dependent on orang asli on the primary source of medication.
Ayob, Z., 2012	Potential of tissue cultured medicinal plants in Malaysia.	Update on the various plant regeneration of metabolites in medicinal plants.	Quantitative Content Analysis	Propagation of local medicinal in Malaysia.
Yuskianti, V., 2018	Medicines in the research forest area of Mount Merapi, KHDTK, Kaliurang, Yogyakarta.	The diversity of herbs and their potential medicines.	Quantitative Content Analysis	Relationship between the diversity of herbaceous strata vegetation with abiotic environmental conditions.
Foo, J., et. al, 2016	Community's dependence on plant resources.	Utilitarian of medicinal plants by the community in the West Coast Sabah.	Qualitative Content Analysis	A disease can be treated with various herbs.
Susanti, A.D., et. al, 2018	The diversity of medicinal plants.	Known the species of plants as utilizing medicinal plants.	Qualitative Content Analysis	Species of plants that used in medicine.
Seyedreiha ni, 2015	Assesment of Ulam Raja (Cosmos caudatus) extract	Evaluate the potential use of herbs in food and beverages.	Quantitative Content Analysis	As a functional ingredient in Beed Patry and Green Tea.
Solin, S.E., 2018	The meaning of traditional foods in the community.	Describes the type, ingredients, and ways of serving.	Qualitative Content Analysis	Type of traditional food to the community of Pakpak.

Mohamad S., et. al, 2011	Study the species used in traditional medicine.	Treat respiratory disease.	Quantitative Content Analysis	Selection of candidate plant species for further phytochemical.
Milow, P., 2011	Characterization of plant resources at Kampung Parit Tok Ngah.	Identify and categorize species of plants in Kampung Parit Tok Ngah.	Qualitative Content Analysis	Specific details on species plants found.
Ong, H.C., et. al, 2011	Traditional medicinal plants used by the Temuan villagers.	Treat various kinds of ailments and other health problems.	Qualitative Content Analysis	Total of medicinal plants used by the villagers.
Kodoh, J., et. al, 2017	Ethnic communities in Kudat, Sabah.	Traditional practices of medicinal plants.	Qualitative Content Analysis	Boiling and mashing were the famous methods.
Vinolina, N.S., 2017	Secondary metabolic content.	Determine the effect of treatment of the content of centelloside.	Quantitative Content Analysis	Response of <i>Centella asiatica</i> .
Ong, H.C., et. al, 2011	Traditional knowledge of medicinal plants.	No study on the medicinal plants used in this particular village.	Qualitative Content Analysis	Method of preparation that is commonly used.
Ong, H.C., et. al, 2012	Traditional knowledge and usage of edible plants among the Temuan villagers.	Identify the usage of edible plants among the Temuan villagers.	Qualitative Content Analysis	Eaten both raw and cooked are the most method used.
Salleh, N.A., et. al, 2002	Presence of <i>Salmonella</i> spp.	Provide insight into potential health.	Quantitative Content Analysis	Raw vegetables are found in Selangor.
Milow, P., et. al, 2010	Preliminary survey on plants.	Identify trends in the diversity of plants grown.	Qualitative Content Analysis	The average of species per home garden was seventeen.
Sarono, J., et. al, 2012	The cultivation of plants Pegagan.	Study the management of the medicinal plant.	Qualitative Content Analysis	Specific details on <i>Centella Asiatica</i> .
Ahmad, F.B., & Ismail, G., 2003	Medicinal plants used by Kadazandusun communities around the crocker range.	Ethnomedical survey in Tambunan and Keningau areas of Sabah.	Qualitative Content Analysis	Field collection trips concentrated on the village.
Mohiddin, M.Y.B., 1991	Traditional medicinal plants of Brunei Darussalam.	Identification of the medicinal plant.	Qualitative Content Analysis	Preparation of herbal plant.
Ong, H.C., & Norzalina, J., 1998	Malay herbal medicine in Gemencheh.	Identify species used by the villagers to treat various ailments.	Qualitative Content Analysis	Diversity of plant species.
Jamal, J.A., 2011	The medicinal plant used Postnatal Care in Malay traditional medicine.	Compile preparations and local medicinal plants used.	Qualitative Content Analysis	Preparations used for Postnatal Care in Malay traditional medicine.
Asterini, A., 2016	Local knowledge of coastal ethnic communities on medicinal plants.	Identify the diversity of medicinal plant species.	Qualitative Content Analysis	Knowledge of coastal ethnic communities.
Kulip, J., et. al, 2000	Medicinal and other useful plants of	Preserve the medicinal and another useful plant	Qualitative Content Analysis	Existing indigenous traditional knowledge of

the Lundayeh community. biodiversity.

the Lundayeh community.

Review On *Centella Asiatica* Among The Malay Community

The systematic literature review as shown in Table 1 provides information on previous studies on the medicinal plants among the Malay community. This will assist further studies to examine what has been done and what was not in this field. As mentioned earlier, the study of medicinal plants among the Malay community is dominated by studies using a qualitative approach, which is 22 out of 30 identified studies. The remaining eight studies are using quantitative approaches. Therefore, this qualitative study can be selected by the researchers if the objective of the study is to explore, compare, or understand phenomena on an issue. According to Table 1, many researchers have performed the study of medicinal plants among the Malay community. Based on the background of previous studies, in addition to the study of medicinal plants among the Malay community, it is also carried out based on the following:

- i. To determine the diversity in particular traditional medicinal plants based on community usage.
- ii. To provide specific information about the use of plants that are used as traditional medicinal plants by the community.

Malaysia has an abundant diversity of plants. It has medicinal herbs that can be used by the surrounding community as herbal medicine that has many benefits. Medicinal plants are ingredients that are naturally derived from plants that have been used for generations for treatment based on experience. Traditional medicinal herbs are more popularly called herbal medicine, which is a basic of cure besides pharmaceutical drugs. Treatment with medicinal plants is part of the cultural system of the community that the potential benefits are very large in the development of public health. Many medical practitioners trained in pharmacology are well aware of the number of modern therapeutic agents that have been derived from the tropical species of Malaysia. Individual plant species often contain thousands of unique chemical entities. Some of the research on local Malaysian plants are Pokok Pinang (*Areca catechu*) which were known to treat stomachache and treat ulcerated nose (Nelson and Heischober, 1999). Hempedu Bumi (*Andrographis paniculate*) were known to treat tonsillitis, flu, chest pain, and diarrhea and fever (Zaidan et al., 2005). While Lemongrass is locally known as Serai (*Cymbopogon citratus*) used to reduce swelling, prevent body odor and also to purify the blood from

infection of bacterial disease (Clement et al., 1994). Bunga tanjung (*Mimusops elengi*) can be applied as a hot compress or burned and the smoke inhaled to alleviate the discomfort of an ulcerated nose (Prasad et al., 2012). Many more Malaysian local plants were used as medicinal properties.

The conclusion of this discussion makes it clear that the reason for choosing a qualitative approach rather than quantitative as a design study of the medicinal plants is based on the dominance of medicinal plants among the Malay community. Although Malay researchers have taken it to an almost high level of influential studies, this does open up the field to other researchers especially non-Malay researchers to study medicinal plants among the Malay community.

Discussion

Nowadays, the study of *Centella Asiatica*, medicinal plants among the Malay community continues to be explored for more knowledge on its uses and to delve deeper into it. According to Gohil et al. (2010), *Centella Asiatica* has been a focus on plant research all over the world and provided evidence that highlights the immense potential of medicinal plants used in various traditional systems of medicine. Studies like these have added a new value to the study of *Centella Asiatica* among the Malay community, opening more space for study in this field. Benefits of medicinal plants especially *Centella Asiatica* as not just an edible plant but its benefits for improvement of blood circulation and wound healing. All aspects of this study should be carefully researched by academics to produce a product that is useful to all groups of people. Further studies on *Centella Asiatica* are expected to produce something for the benefit of the Malay community.

Conclusion

That is the beauty of the study of *Centella Asiatica* among the Malay community. Moreover, this study recommends that the study of *Centella Asiatica* among the Malay community should be continued for further investigation on what has been done by other researchers either written or implied.

References

- Adnan, N., & Othman, N. (2012). The relationship between plants and the Malay

- culture. *Procedia-Social and Behavioral Sciences*, 42, 231-241.
- Ahmad, F. B., & Ismail, G. (2003). Medicinal plants used by Kadazandusun communities around Crocker Range. *ASEAN Review of Biodiversity and Environmental Conservation (ARBEC)*, 1, 1-10.
- Asterini, A. (2016). Pengetahuan Lokal Masyarakat Etnis Pesisir Tentang Tumbuhan yang Berkhasiat Obat di Lima Kecamatan Kabupaten Lampung Selatan.
- Awang-Kanak, F., Bakar, M. F. A., & Mohamed, M. (2018, August). Ethnobotanical survey on plants used as traditional salad food (ulam) in Kampung Taun Gusi, Kota Belud Sabah, Malaysia. In *AIP Conference Proceedings* (Vol. 2002, No. 1, p. 020024). AIP Publishing.
- Ayob, Z., Wagiran, A., & Samad, A. A. (2013). Potential of tissue cultured medicinal plants in Malaysia. *Jurnal Teknologi*, 62(1).
- Bachok, M. F., Yusof, B. N. M., Ismail, A., & Hamid, A. A. (2014). Effectiveness of traditional Malaysian vegetables (ulam) in modulating blood glucose levels. *Asia Pacific journal of clinical nutrition*, 23(3), 369-376.
- Clement, Y.N., Williams, A.F., Khan, K., Bernard, T., Savrina, B., Fortune, M., Medupe, O., Nagee, K. & Seaforth, C.E. (1994). A gap between acceptance and knowledge of herbal remedies by physicians: The need for educational intervention. *BMC Complementary and Alternative Medicine* 5: 20.
- Foo, J., Mohamad, A. L., Omar, M., & Amir, A. A. (2016). Utilitarian tumbuhan ubatan di Tamu Pantai Barat Sabah (Utilitarian of Medicinal plants in Tamu (local market) of West Coast, Sabah). *Geografia-Malaysian Journal of Society and Space*, 12(12).
- Gohil, K.J., Patel, J.A & Gajjar, A.K. (2010). Pharmacological Review on *Centella asiatica*: A Potential Herbal Cure-all. *Indian Journal of Pharmaceutical Sciences*. 72(5): 546-556.
- Hashim, P. (2011). *Centella asiatica* in food and beverage applications and its potential antioxidant and neuroprotective effect. *International Food Research Journal*, 18(4), 1215.
- Hean Chooi Ong, Rosnaini Mat Zuki & Pozi Milow (2011) Traditional Knowledge of Medicinal Plants among the Malay Villagers in Kampung Mak Kemas, Terengganu, Malaysia, *Studies on Ethno-Medicine*, 5:3, 175-185.
- Izzah, A. N., Aminah, A., Pauzi, A. M., Lee, Y. H., Rozita, W. W., & Fatimah, D. S. (2012). Patterns of fruits and vegetable consumption among adults of different ethnics in Selangor, Malaysia. *International Food Research Journal*, 19(3), 1095.
- Jamal, J. A. (2006). Malay traditional medicine. *Tech Monitor (Special Feature: traditional Medicine: S & T Advancement)*, 37-49.
- Jamal, J. A., Ghafar, Z. A., & Husain, K. (2011). Medicinal plants used for postnatal care in Malay traditional medicine in the Peninsular Malaysia. *Pharmacognosy Journal*, 3(24), 15-24.
- James, J., & Dubery, I. (2009). Pentacyclic triterpenoids from the medicinal herb, *Centella asiatica* (L.) Urban. *Molecules*, 14(10), 3922-3941.
- Khatun, M. A., Harun-Or-Rashid, M., & Rahmatullah, M. (2011). Scientific validation of eight medicinal plants used in traditional medicinal systems of Malaysia: a review. *American-Eurasian Journal of Sustainable Agriculture*, 5(1), 67-75.
- Kodoh, J., Mojiol, A. R., Lintangah, W., Gisiu, F., Maid, M., & Liew, K. C. (2017). Traditional knowledge of the uses of medicinal plants among the ethnic communities in Kudat, Sabah, Malaysia. *Int. J. Agr. Forest. Planta*, 5, 79-85.
- Kulip, J., Majawat, G., & Kulik, J. (2000). Medicinal and other useful plants of the Lundayeh community of Sipitang, Sabah, Malaysia. *Journal of Tropical Forest Science*, 12(4), 810-816.
- Lee, Y. Y., Ismail, A. W., Mustaffa, N., Musa, K. I., Majid, N. A., Choo, K. E., ... & Graham, D. Y. (2012). Sociocultural and dietary practices among Malay subjects in the north-eastern region of Peninsular Malaysia: a region of low prevalence of *Helicobacter pylori* infection. *Helicobacter*, 17(1), 54-61.
- Milow, P., Ghazali, N. H., Mohammad, N. S., & Ong, H. C. (2011). Characterization of plant resource at Kampung Parit Tok Ngah, Perak, Malaysia. *Scientific Research and Essays*, 6(13), 2606-2618.
- Milow, P., Ramli, M. R., & Chooi, O. H. (2010). Preliminary survey on plants in home gardens in Pahang, Malaysia. *Journal of Biodiversity*, 1(1), 19-25.
- Mohamad, S., Zin, N. M., Wahab, H. A., Ibrahim, P., Sulaiman, S. F., Zahariluddin, A. S. M., & Noor, S. S. M. (2011). Antituberculosis potential of some ethnobotanically selected Malaysian plants. *Journal of ethnopharmacology*, 133(3), 1021-1026.
- Mohiddin, M. Y. B. H., Chin, W., & Holdsworth, D. (1991). Traditional Medicinal Plants of Brunei

- Darussalam Part II Sengkurong. *International journal of pharmacognosy*, 29(4), 252-258.
- Nelson, B.S. & Heischouer, B. (1999). Betel Nut : A common drug used by naturalized citizens from India, Far East Asia and the South Pacific Islands. *Annals of Emergency Medicine* 34: 238 – 243.
- Ong, H. C., & Norzalina, J. (1999). Malay herbal medicine in gemenchah, Negeri Sembilan, Malaysia. *Fitoterapia*, 70(1), 10-14.
- Ong, H. C., Ahmad, N., & Milow, P. (2011). Traditional medicinal plants used by the temuan villagers in Kampung Tering, Negeri Sembilan, Malaysia. *Studies on Ethno-Medicine*, 5(3), 169-173.
- Ong, H. C., Norliah, A., & Sorayya, M. (2012). Traditional knowledge and usage of edible plants among the Temuan villagers in Kampung Tering, Kuala Pilah, Negeri Sembilan, Malaysia. *Indian Journal of Traditional Knowledge* Vol. 11(1), January 2012, pp. 161-165.
- Prasad V. K., Kavita N. Y., Ramesh S. D., Rakesh S. S., Manohar J. P. (2012). *Mimusops elengi*: A Review on Ethnobotany, Phytochemical and Pharmacological Profile. *Journal of Pharmacognosy and Phytochemistry*, 1(3): 64 – 74.
- Salleh, N. A., Rusul, G., Hassan, Z., Reezal, A., Isa, S. H., Nishibuchi, M., & Radu, S. (2003). Incidence of Salmonella spp. in raw vegetables in Selangor, Malaysia. *Food Control*, 14(7), 475-479.
- Samuel, A. J. S. J., Kalusalingam, A., Chellappan, D. K., Gopinath, R., Radhamani, S., Husain, H. A., ... & Promwichit, P. (2010). Ethnomedical survey of plants used by the Orang Asli in Kampung Bawong, Perak, West Malaysia. *Journal of ethnobiology and ethnomedicine*, 6(1), 5.
- Sarono, J. (2012). Budidaya tanaman pegagan (centella asiatica l) dan manfaatnya dalam kehidupan sehari-hari (Di Upt Materia Medica Batu, Malang). Laporan Tugas Akhir (D III), Fakultas Pertanian, Universitas Sebelas Maret, Jawa Tengah.
- Seevaratnam, V., Banumathi, P., Premalatha, M. R., Sundaram, S. P., & Arumugam, T. (2012). Functional properties of Centella asiatica (L.): a review. *Int J Pharm Pharm Sci*, 4(5), 8-14.
- Seyedreihani, S. F. (2015). *Assessment of Ulam Raja (Cosmos Caudatus) Extract as a Functional Ingredient in Beef Patty and Green Tea*, Doctoral dissertation, Universiti Sains Malaysia.
- Solin, S. E. (2018). Makanan Tradisional Masyarakat Pakpak: Kajian Folklor. Skripsi Sarjana. Program Studi Sastra Batak Fakultas Ilmu Budaya Universitas Sumatera Utara Medan
- Susanti, A. D., Wijayanto, N., & Hikmat, A. (2018). The Diversity of Medicine Plant in Repong Damar Agroforestry of Krui, Lampung Province. *Media Konservasi*, 23(2), 162-168.
- Vinolina, N. S. (2017). Kandungan Metabolit Sekunder (Centellosida) Pegagan (Centella asiatica) Aksesori Deli Serdang. Prosiding Seminar Nasional PERAGI 2017, Bogor.
- Yuskianti, V., Saadi, M. H., & Handayani, T. (2019). Diversity and Potential of Herb Vegetation in Forest Area With Special Purpose (KHDTK) Kaliurang Yogyakarta as Medicines. *Jurnal Wasian*, 6(1), 11-26.
- Zahara, K., Bibi, Y., & Tabassum, S. (2014). Clinical and therapeutic benefits of Centella asiatica. *Pure and Applied Biology*, 3(4), 152.
- Zaidan, M.R., Noor, R.A., Badrul, A.R., Adlin, A., Norazah, A & Zakiah, I. (2005). *In vitro* screening of five local medicinal plants for antibacterial activity using disc diffusion method. *Trop Biomed* 22: 165 - 170.