International Journal of Herbal Medicine
Available online at www.florajournal.com

E-ISSN: 2321-2187
P-ISSN: 2394-0514
www.florajournal.com
IJHM 2022; 10(6): 10-14
Received: 09-10-2022
Accepted: 12-11-2022

Azalia Khofifah Putri
Faculty of Foresty, Lambung Mangkurat University, Indonesia

Siti Hamidah
[1] Faculty of Foresty, Lambung Mangkurat University, Indonesia
[2] Center for Tropical Forest Studies, Lambung Mangkurat University, Indonesia
[3] Center of Innovation, Technology, Commercialization, Management, Forest and Wetlands, Lambung Mangkurat University, Indonesia

Dan Lusyiani
Faculty of Foresty, Lambung Mangkurat University, Indonesia

Yudi Firmanul Arifin
[1] Faculty of Foresty, Lambung Mangkurat University, Indonesia
[2] Center for Tropical Forest Studies, Lambung Mangkurat University, Indonesia
[3] Center of Innovation, Technology, Commercialization, Management, Forest and Wetlands, Lambung Mangkurat University, Indonesia

Corresponding Author:
Azalia Khofifah Putri
Faculty of Foresty, Lambung Mangkurat University, Indonesia

Organoleptic test for herbal honey made from kelulut honey (*Heterotrigona itama*) and Sungkai's leaf extract (*Peronema canescens* Jack)

Azalia Khofifah Putri, Siti Hamidah, Dan Lusyiani and Yudi Firmanul Arifin

DOI: https://doi.org/10.22271/flora.2022.v10.i6a.838

Abstract
This research was to determine the effect of herbal honey formulations made from kelulut honey (*Heterotrigona itama*) and sungkai leaf extract (*Peronema canescens* Jack) with distilled water in terms of organoleptic tests based on SNI 8664:2018 standards. The method used maceration extraction of sungkai leaf shoots simplicia using distilled water and mixed with kelulut honey. The organoleptic test of herbal honey used a differentiating test method on 28 researchers with taste and aroma parameters. The test results showed that the sungkai leaf extract formulation had a very significant effect on the aroma and taste of the honey. The formulation of sungkai leaf extract which still showed a taste and aroma like pure honey was 0.25 gr of sungkai leaf extract mixed in 60 ml of kelulut honey.

Keywords: Honey, kelulut, leaf, organoleptic, sungkai

1. Introduction
The use of herbal products for health is increasing and getting a lot of attention due to the ease of obtaining raw materials and processing methods and the relatively affordable price. One of the herbal products that is currently being developed is herbal honey. Herbal honey is honey with additional or herbal mixtures which have certain ingredients and are efficacious for health, such as the treatment of diseases, and also for body care. The efficacy of herbal honey varies according to the added extract. Until now, herbal honey is still often used even though its properties are not as fast as chemical drugs. One of the herbal honeys that currently has the potential to be developed is herbal honey from kelulut honey and extract of sungkai leaf.
Kelulut honey is honey produced by *Trigona* bees (kelulut), namely bees that do not have a sting (stingless bee) and defend themselves by biting [1]. Traditionally, honey bee kelulut is used in the treatment of anti-aging, healing wounds, coughs and colds quickly. Honey bee kelulut is also reported to have various pharmacological effects such as anti-diabetic, antioxidant and antibacterial [2]. Kelulut honey is commonly used for wound treatment with its role as a nutrient in accelerating wound healing, wound debridement, anti-inflammatory, and antibacterial [3] this is supported by the results of research conducted by [25] showing the presence of the content of flavonoids, alkaloids, tannins, and saponins in *Trigona* sp honey.
Sungkai (*Peronema canescens* Jack) belongs to the Verbenaceae family, in West Java it is called Jati Sabrang and in South Kalimantan it is popular as longkai. The distribution area in Indonesia covers the areas of West Sumatra, Jambi, Bengkulu, South Sumatra, Lampung, West Java, and the whole of Kalimantan [5]. People in various regions in Indonesia have long used sungkai leaves as medicine. Sungkai leaves are used as a medicine for colds, fever and intestinal worms by the people of East Kalimantan [6]. People in South Sumatra and Lampung use Sungkai leaves as anti-plasmodium and fever medicine [7-8], in tribal medicine. Lembak Bengkulu, infusion of Sungkai leaves is used to reduce fever, malaria and maintain health [23]. Stated that Sungkai leaf extract has an effect on immunity. Meanwhile, various research results also show the potential of sungkai leaves as medicine. Sungkai leaves contain the active compound Peronemin which functions as a malaria drug [24]. Sungkai leaves contain antibacterial compounds [11]. Young sungkai leaves contain flavonoids which have antipyretic effects. The results of the phytochemical screening of Sungkai leaves contain various active compounds, namely: phenolic compounds, tannins, alkaloids, steroids, saponins and flavonoids that have potential as antioxidants (Fadlilaturrahmah, 2021) [12].
In the pandemic era some time ago, the use of sungkai leaves as an ingredient to support health and increase immunity is increasingly widespread.

Likewise, the consumption of honey, especially honey kelulut for the same purpose is also increasingly being carried out by the community. Herbal honey products made from sungkai leaf extract have the potential to be used as intake to support health and body immunity. Based on this, the researchers wanted to know how the organoleptic test results of honey mixed with sungkai leaf extract were. According to [8], based on people's habits the use of young sungkai leaves as a febrifuge is a handful of adult hands weighing 15 gr for one consumption, but the strong bitter taste of sungkai leaves is a consideration. Based on this, it is necessary to carry out research on organoleptic tests of herbal honey of sungkai leaf extract made in various extract formulations. The purpose of this study was to determine the effect of herbal honey formulations made from kelulut honey and sungkai leaf extract with distilled water as a solvent on the taste and aroma of the honey it produces. The test results will be compared with the SNI standard for pure Kelulut Honey which is not added with sungkai leaf extract. The results are expected to obtain an extract formulation that still meets the SNI standard for Honey Kelulut (pure), namely SNI 8664 [13], in this case based on the results of organoleptic tests, the taste and aroma of herbal honey still has a taste and aroma like real honey (without the addition of herbal extracts). Organoleptic tests have an important role in formula processing to produce products because they are directly related to consumer tastes. In addition, organoleptic tests are used to control product quality consistency

2. Research Methodology

The research was carried out for 3 (three) months (January-March 2022), starting from the preparation of research samples, testing and data analysis. Sample preparation was carried out at the Honey Laboratory of the Center for Innovation, Technology, Commercialization, Management: Forests & Wetlands, University of Lambung Mangkurat. The manufacture of aquadest soluble extract from sungkai leaves was carried out at the Laboratory of Biochemistry and Bio molecular Medicine, Faculty of Medicine, University of Lambung Mangkurat.

2.1 Research procedure

2.1.1 Tool and ingredient

The tools used in this study were trays, blender (herb powder machine), test tubes, funnels, filter paper, erlenmeyer, rotary vacuum evaporator, bottles, scales, bowls, spoons, and plastic spatulas.

The materials needed in this study include water, kelulut honey, sungkai leaves, and kelulut honey which are used from kelulut honey produced by Miftaul UlumTabalong Islamic Boarding School. Sungkai leaves are taken from the shoots, obtained from the sungkai plant that grows in Kiram Village, Banjar Regency.

2.1.2 Making Sungkai Leaf Simplicia

Sungkai leaves that were used as research samples came from the sungkai plant that grows in Kiram Village, Banjar Regency. The leaves are taken from the young part (the shoots of the leaves). According to [8], the extract of young Sungkai leaves contains several active substances, namely, peronemin, sitosterol, isopropanol, phytol, dipterpenoid, flavonoid so it is possible that these elements help in increasing the number of leukocytes, which are body cells that function in the system. immune system (cells of the immune system).

The manufacture of sungkai leaf simplicia begins with the stage of preparing young leaves of about 1 kg which will be cleaned using running water, drained and then dried without direct sunlight for 3-7 days. The dried leaves are then ground into powder using a blender or herbal powder machine. The main purpose of drying simplicia according to Yamin *et al*,. 2017 is to reduce the water content of the material so that it can inhibit the growth of unwanted microbes because it can affect the quality of the simplicia. In general, the temperature for drying simplicia materials is in the range of 30°-90 °C, and the best temperature is not more than 60 °C [14].

2.1.3 Making Sungkai Leaf Extract

Based on the guidelines for the preparation of natural medicinal plants at the Biochemistry and Bio molecular Laboratory of the Faculty of Medicine, ULM, the process of making sungkai leaf extract using the maceration method is to soak the sungkai leaf powder with distilled water for 3 days while occasionally stirring it until the solvent and sample are evenly mixed. The liquid extract was then filtered using an Erlemeyer, funnel, and filter paper to separate the dregs up to 3 times or the filtrate obtained was clear. The rest of the material or dregs can be repressed for 24 hours with the amount of solvent 3 times the weight of the material. Remuneration can be done 3 times. Remuneration is done to increase the effectiveness of the extraction. Remuneration is done because there are compounds left behind (not yet extracted). The collected filtrate was concentrated with a rotary vacuum evaporator at a temperature of 40 °C to obtain a thick extract and evaporated using a water bath at a temperature of 60-80 °C.

2.1.4 Making Herbal Honey

Kelulut honey was homogenized with sungkai leaf extract with formulation F1 = Formula-1 or Control (60 ml kelulut honey without sungkai leaf extract); F2 = Formula-2 (60 ml kelulut honey + 0.25 g sungkai leaf extract); F3 = Formula-3 (60 ml of kelulut honey + 0.50 g of sungkai leaf extract; and F4 = Formula-4 (60 ml of kelulut honey + 0.75 g of sungkai leaf extract). The homogenization process of the formula was carried out manually with a tool made According to empirical knowledge of the community which says that honey should not be taken with a spoon made of stainless steel or other metals, this is because metal can decompose and change the composition of honey so that the prepared formula is not mixed using a stirrer or hand mixer because it contains metal.

The homogenized formula was put into bottles and stored in the refrigerator. According to [15] honey storage at cold temperatures is preferable to room temperature, because at room temperature the humidity level is higher, so honey is easier to absorb water, with high water content it is easier to cause fermentation.

2.1.5 Organoleptic Test

This study uses organoleptic analysis with the test method of differentiation. According to [16], the differentiation test aims to assess the effect of changes in the production process or substitution of materials in food processing and to determine the differences between two or more products of the same raw material in terms of processing, formulation and others. Organoleptic test preparation starts from providing a panelist in charge of assessing or analyzing the sensory properties of a commodity. The panelists needed are trained panelists of 3 people or 1 person aexpert panelists and 25 general panelists who have an interest and concern for this work. Panelists are

also expected to provide specific time for assessment and sensitivity as needed. The organoleptic test parameters based on SNI 8664 [13] are taste and aroma. Panelists were asked to rate in the questionnaire provided. The results of the assessment are stated with the number 1 (one) if the taste and aroma still show a taste and aroma like pure honey (not yet or not given any herbal extracts), while if the panelists consider the taste and aroma to be not the same as pure honey, the panelists give a value of 2 (two).

2.2. Data analysis: The organoleptic test assessment data were then analyzed using a completely randomized design. Data were analyzed by ANOVA (Analysis of variance). One-way ANOVA test aims to determine the significance of the difference in mean (μ) between one formulation and another. Furthermore, if the results show a real or very significant difference from the effect of the treatment, a further test or a different test is carried out according to the size of the KK (Coefficient of Diversity).

3. Result and Discussion

Sensory attributes such as taste and aroma are often taken into consideration by consumers in choosing products to be consumed. The organoleptic test carried out in this study aims to determine the best formula according to people's tastes for herbal honey made from kelulut honey and sungkai leaf extract with water as a solvent. Based on SNI 2018 regarding food quality control, organoleptic testing of honey uses parameters, namely taste and aroma. Therefore, in this study, herbal honey made from kelulut honey with the addition of sungkai leaf extract in various formulations was tested for taste and aroma.

3.1 Flavor: Taste is something that is received by the tongue. In sensing human taste, there are four main tastes, namely sweet, bitter, sour and salty and there is an additional response when modification is made [17]. The results of the organoleptic test analysis of herbal honey flavors made in various formulations of sungkai leaf extract can be seen in Table 1.

Table 1: Results of Taste Testing on 4 (Four) Herbal Honey Formulations

Number of repetitions	Treatments				Total	Mean
	F1	F2	F3	F4		
1	1	1	1,61	1,89	5,5	1,375
2	1	1	1,61	1,89	5,5	1,375
3	1	1	1,61	1,93	5,54	1,384
Total	3	3	4,82	5,71	16,54	
Mean & Difference Test	1(c)	1(c)	1,61(b)	1,90 (a)		1,380
ANOVA Test (Extract Formulation Treatment)	**					
Indonesian Standard SNI 8664 (2018)	√	√	×	×		

F1: Formulation-1 (60 ml kelulut honey + 0 g sungkai leaf extract dissolved in aquades)
F2: Formulation-2 (60 ml kelulut honey + 0.25 g sungkai leaf extract dissolved in aquades)
F3: Formulation-3 (60 ml kelulut honey + 0.50 g sungkai leaf extract dissolved in aquades)
F4: Formulation-4 (60 ml of kelulut honey + 0.75 g of sungkai leaf extract dissolved in distilled water)
√: Meets SNI Standard 8664 (2018)/ Typical taste of kelulut honey
×: Does not meet the standard of SNI 8664/ Taste is not typical of kelulut honey

The results showed that the treatment (addition of water-soluble sungkai leaf extract in various formulations) on kelulut honey had a very significant effect on the taste of the honey produced. The more the amount of sungkai leaf extract added to the honey, it causes the honey taste to change (honey becomes bitter) so that the distinctive taste of honey is reduced. Based on the analysis of the different tests, it showed that F2 = Formulation-2 (60 ml of kelulut honey + 0.25 gr of sungkai leaf extract dissolved in aquadest) was the optimal formula that still tasted like pure honey. Likewise, when compared to the standard SNI 8664 (2018) [13], F2 or Formulation-2 is the only formula that still meets the SNI standard, and the results are not significantly different from F1 or Formula-1 (control), namely pure honey.

In general, the taste of herbal honey made from kelulut honey and cold water-soluble extract of sungkai leaves has a pronounced sour taste, especially F1: Formula-1 or control (60 ml of kelulut honey + 0 g of sungkai leaf extract) and F2: Formula-2 (60 ml of kelulut honey + 0.25 gr of sungkai leaf extract), while the other formulas are F3 = Formula-3 (60 ml of kelulut honey + 0.50 gr of sungkai leaf extract) and F4 = Formula-4 (60 ml of kelulut honey + 0, 75 gr of sungkai leaf extract) the taste of honey which was originally sour began to change to a more dominant bitter taste. This shows that the greater the herbal extract added to the honey causes the honey taste to become bitterer, this is why the herbal honey taste is not typical of honey anymore. This is as revealed by [18] which states that the results of organoleptic examination of the ethanol extract of sungkai leaves that were carried out obtained the results of the extract in the form of a thick blackish green liquid, having a characteristic sungkai odor and a bitter taste. Furthermore, [19] regarding the antioxidant and anti tyrosinase activity of the n-butanol fraction of Sungkai leaves (*Peronema canescens* Jack.) contributes to the bitter astringent taste of a plant. Meanwhile, the characteristic sour taste of kelulut and high water content is one of the characteristics of kelulut honey [20]. The sour taste in kelulut honey can be caused by the source of kelulut honey feed, water content, and harvest time. The study of [21] stated that honey harvested in the rainy season had lower levels of reducing sugars than honey harvested in the dry season. This can be attributed to the high humidity during the rainy season which results in increased water content in kelulut honey.

Based on the results of this study, the best herbal extract formulation in terms of taste was F2 = Formula-2 (60 ml of kelulut honey + 0.25 gr of sungkai leaf extract) where according to the panelists the taste of honey was still like pure honey (without additional extract), which was like F1 = Formula-1 or control (60 ml kelulut honey + 0 g sungkai leaf extract). The taste of honey produced by both is a typical honey taste of kelulut honey which has a sweet and sour taste.

3.2 Aroma

Aroma is the smell of the product which is one of the parameters in testing the sensory properties (organoleptic) using the sense of smell. Aroma is acceptable if the resulting material has a specific aroma [22]. The aroma of herbal honey comes from a mixture of the distinctive aroma of kelulut

honey and sungkai leaf extract derived from secondary metabolites. The panelists' organoleptic test results for aroma can be seen in Table 2.

Table 2: Aroma test results on 4 (four) herbal honey formulations

Number of repetitions	Treatment				Total	Mean
	F1	F2	F3	F4		
1	1	1	1,61	1,86	5,47	1,368
2	1	1	1,68	1,86	5,54	1,385
3	1	1	1,68	1,86	5,54	1,385
Total	3	3	4,97	5,58	16,55	
Mean & Difference Test	1(c)	1(c)	1,66(b)	1,86(a)		1,38
ANOVA Test (Extract Formulation Treatment)	**					
Indonesian Standard SNI 8664 (2018)	√	√	×	×		

Information
F1: Formulation-1 (60 ml kelulut honey + 0 g sungkai leaf extract dissolved in aquades)
F2: Formulation-2 (60 ml kelulut honey + 0.25 g sungkai leaf extract dissolved in aquades)
F3: Formulation-3 (60 ml kelulut honey + 0.50 g sungkai leaf extract dissolved in aquades)
F4: Formulation-4 (60 ml of kelulut honey + 0.75 g of sungkai leaf extract dissolved in distilled water)
√: Meets SNI Standard 8664 (2018)/ Typical aroma of kelulut honey
×: Does not meet the standard of SNI 8664/ Aroma Not typical of kelulut honey

Analysis of variance showed that the use of cold water soluble sungkai leaf extract in various formulations had a very significant effect on the aroma of the herbal honey produced. More and more sungkai leaf extract is added to the honey, causing the honey's aroma to be not typical of pure kelulut honey (without herbal mixtures). This shows that the larger the dose of herbal extract added to the honey causes the distinctive aroma of honey to decrease so that the aroma of the herbal honey is no longer typical of honey. Research conducted by [18] stated that the ethanol extract of sungkai leaves has a distinctive sungkai odor derived from the secondary metabolites contained in it. Another factor is the relatively uniform consumer acceptance. The higher the value obtained, the lower the characteristic aroma of honey in herbal honey. This can be caused by differences in the amount of material composition, besides that the condition of the panelists at the time of the test can also affect the results obtained.

The results of the different test analysis showed that F2 = Formula-2 (60 ml of kelulut honey + 0.25 gr of sungkai leaf extract) was the optimal formula that still had a distinctive honey aroma like pure honey. Likewise, when compared to SNI 8664 [13], F2 or Formula-2 is the only formula that still meets SNI standards, and the results are not significantly different from F1 or Formula-1 (control), namely pure kelulut honey without herbal mixtures. Based on the results of these studies, the best formulation so that the honey aroma still has a distinctive honey aroma, so that it still meets the SNI standard is F2 = Formula-2 (60 ml of kelulut honey + 0.25 gr of sungkai leaf extract) where according to the panelists the aroma of honey is still like honey. Pure (without additional extract) ie like F1 = Formula-1 or control (60 ml kelulut honey + 0 grsungkai leaf extract). The aroma of honey produced by both is the typical honey aroma of kelulut honey. Meanwhile, the other formulas, namely F3 = Formula-3 (60 ml of kelulut honey + 0.50 g of sungkai leaf extract) and F4 = Formula-4 (60 ml of kelulut honey + 0.75 gr of sungkai leaf extract) had a typical honey aroma. Changed to the dominant aroma of sungkai leaf extract.

4. Conclusion and Recommendation

4.1 Conclusions

Based on the results of panelists' assessment of herbal honey made from kelulut honey and cold water soluble extract of sungkai leaves, it can be concluded that the herbal honey formulation has a very significant effect on the taste and aroma of the herbal honey produced. The best formula based on panelists' assessment was herbal honey F2 = Formula-2, namely 60 ml kelulut honey added 0.25 gr of sungkai leaf extract. The addition of a maximum of 0.25 gr of sungkai leaf extract into 60 ml still has a distinctive honey taste and aroma, so that if the addition of more than 0.25 gr of sungkai leaf extract into 60 ml of kelulut honey will produce herbal honey that has a dominant taste and aroma of sungkai or not typical of honey so that it no longer meets SNI standards.

4.2 Recommendation

It is recommended that further research be carried out whether the formulation is also an optimal formula in terms of its properties, such as antioxidant content, antipyretic, etc. Likewise, it is also necessary to further test using other extraction methods, such as hot water soluble extraction, alcohol extraction and others.

5. Acknowledgement

Authors acknowledge to the Director of Center of Innovation, Technology, Commercialization, Management: Forest & Wetlands for encouragement of research work and kind permission to publish this paper. Authors also acknowledge the help received from everyone in laboratory for this study work.

6. References

1. Winarto V. Rusmalia. *Trigona* sp. honey bee cultivation. BP2SM Kementerian Lingkungan Hidup dan Kehutanan Jakarta; c2015.
2. Yazan LS, Zainal NA, Ali RM, Zali M, Shyfiq MF, Sze OY, *et al*. Antiulcer properties of kelulut honey against ethanol-induced gastric ulcer. Pertanika Journal of Science Technology. 2018, 26(1).
3. Weliyani Nugroho RA, Syafrizal. Anticoagulant Activity Test of Propolis *Trigona* laeviceps Extract against Mice's Blood (*Mus musculus* L.). Proceedings of the Science and Technology Seminar. 2015;1(1):1-10.
4. Saadaoui E, Yahia KB, Chemlali I, Belaïd S, Romdhane CB. Eucalypt in the Tunisian arid region: Diversity and valorization for honey production. Int. J Agric. Nutr. 2022;4(1):1-5. DOI: 10.33545/26646064.2022.v4.i1a.45
5. Khaerudin. Plant Nursery of Industrial Plantation Forest. Penebar Swadaya. Jakarta; c2004.

6. Harmida S, dan Yuni VF. Ethno phyto medicine Study in Lawang Agung Village, Mulak Ulu District, Lahat Regency, South Sumatra. Jurnal Penelitian Sains. 2011;14(1)(D):14110-42
7. Heyne K. Useful Plants of Indonesia, Volume II, Sarana Wana Jaya Foundation: Circulated by the Employee Cooperative, Forestry Research and Development Agency Jakarta; c1987.
8. Yani AP, Ruyani A, Ansyori I, dan Irwanto R. The potential test of sungkai young leaves (*Peronema canescens*) to maintain good health (Immunity) in Mice (*Mus musculus*). Seminar Nasional I=XI Pendidikan Biologi FKIP UNS, p.245-250.
9. Reshma Krishnan, Thasniya Mohammed, Gopika S Kumar, Arunima SH. Honey crystallization: Mechanism, evaluation and application. The Pharma Innovation Journal. 2021;10(5S):222-231. DOI: 10.22271/tpi.2021.v10.i5Sd.6213
10. Amitava Roy, Anil Kumar, Anu Singh, Anusri Mandi, Mainak Barman. Analysis of genetic diversity and correlation studies on grain yield and its component characters in bread wheat (*Triticum aestivum* L. em Thell) genotypes. Pharma Innovation. 2021;10(5):341-345.
11. Ningsih *et al*. Antimicrobial Potential and Spectroscopic Analysis of Active Isolate N-Hexane Extract of Sungkai Leaves *Peronema canescens* Jack Against Several Test Microbes. Makassar. Faculty of Pharmacy Hasanuddin University; c2013.
12. Fadlilaturrahmah F, Putra AMP, Rizki MI, Nor T. Antioxidant and Anti tyrosinase Activity Test of the n-Butanol Fraction of Sungkai Leaves (*Peronema canescens* Jack.) Qualitatively Using Thin Layer Chromatography. Journal of Pharma science. 2021;8(2): 90-101.
13. Indonesian National Standard (SNI) nomor 8664. Indonesian National Standard (SNI) number 8664 of concerning Honey; c2018.
14. Departemen Kesehatan RI. How to Make Simplicia. Directorate General of Drug and Food Control Jakarta; c1985. p. 4-15.
15. Devyana. Analysis of Honey Quality (Acidity, Moisture Content, and Reducing Sugar Content) Based on Differences in Storage Temperature. Faculty of Science and Technology Universitas Airlangga. Research Chemistry journal. 2017, 6(1).
16. Setyaningsih D. A. Apriyantono, dan M. P. Sari. Sensory Analysis for the Food and Agro Industry. Bogor Press Institute of Agriculture Bogor; c2010.
17. Zuhra CF. Cita Rasa (Flavor). Department of Chemistry FMIPA. University of Northern Sumatra Medan; c2006.
18. Rezeki Teresia. Thesis Test Immunostimulant Effects of Ethanol Extract of Sungkai Leaves (*Peronema canescens* Jack) on the Activity and Phagocytosis Capacity of Peritoneal Macrophage Cells in Mice. Faculty of Pharmacy, Indonesian Pioneer University; c2021.
19. Fadlilaturrahmah F, Putra AMP, Rizki MI, Nor T. Antioxidant and Anti tyrosinase Activity Test of n-Butanol Fraction of Sungkai Leaves (*Peronema canescens* Jack.) Qualitatively Using Thin Layer Chromatography. Pharma science Journal 20218(2):90-101.
20. Chuttong BY, Chanbang K, Sringarm dan M Burgett. Physicochemical Profiles of Stingless Bee (Apidae: Meliponini) Honey From South East Asia (Thailand). Food Chemistry. 2016;92:149-155.
21. Ridoni R, Radam R Fatriani. Analysis of the quality of kelulut honey (*Trigona* sp.) from Mangkauk Village, Pengaron District, Banjar Regency. Jurnal Sylva Scienteae. 2020;3(2):346-355.
22. Kusmawati Aan H, Ujang dan E. Evi. Basics of Agricultural Product Processing I. Central Graphics Jakarta; c2000.
23. Ariefa Primair. Local Wisdom in the Use of Medicinal Plants by the Lembak Eight Tribe in Bengkulu Tengah Regency, Bengkulu. Semirata. Unila. Lampung. 2013;1(1).
24. Kitagawa. Chemical Structures of Four New Resin-Glycosides, Merremosides F, G, H1, H2, From the Tuber of *Merremia mammosa* (Convolvulaceae), Chem. Pharm. Bull. 1996;44:1693-1699.
25. Zahra NN, Muliasari H, Andayani Y, Sudarma IM. Physicochemical Characteristics of Honey and Propolis Extract *Trigona* sp. from North Lombok. J. ARGOTEK UMMAT. 2021, 8(1).