FACULTY OF PHARMACY
UNIVERSITAS HASANUDDIN

ABSTRACT BOOK

ISBDD 2019

International Seminar
on Bioscience and Drug Discovery
"Frontiers in Drug Discovery & Development"

7th-8th, November 2019, Makassar, Indonesia

RUNDOWN ISBDD 2019

"FRONTIERS IN DRUG DISCOVERY AND DEVELOPMENT"

7th – 8th November 2019, Makassar, Indonesia

Venue : Novotel Hotel Makassar

Conference Day I, Thursday, 7th November 2019

Schedule	Event	PIC/Notes
08.00 – 09.00 a.m.	Registration Day I	Organising Committe
09.00 – 09.30 a.m.	Opening Ceremony 1. Traditional Dance 2. Indonesia National Anthem : Indonesia Raya 3. Mars Universitas Hasanuddin	Organising Committe
09.30 – 10.00 a.m.	Welcoming Speech	1. Muhammad Aswad (Chair of ISBDD) 2. Gemini Alam (Dean, Faculty of Pharmacy , Universitas Hasanuddin) 3. Dwia Aries Tina Pulubuhu (Rector of Universitas Hasanuddin) Official Opening by Rector Unhas
10.00 – 10.30 a.m.	Keynote speaker	Nurdin Abdullah (Governor of South Sulawesi)
10.30 – 12.30 p.m.	Invited Speaker • *Application of Rational Drug Design in Selecting of Plants and Design of New compounds for Anti-Infectives"* • *Pharmacogenomics and Drug Related Problems*	Habibah A. Wahab (School of Pharmaceutical Sciences, Universiti Sains Malaysia) Chris Alderman (School of Pharmacy and Medical Sciences, University of South Australia Moderator : Yulia Yusrini Djabir

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12.30 – 01.30 p.m.	Lunch	Organising Committe
01.30 – 04.00 p.m.	Invited Speaker : • *Discovery of Anti-mycobacterial Compounds from Microorganisms* • *A Decade of Anti-Malarial Research in UKM* • *Development of Sulfo-based Click-type Reactions in Biosciences and Drug Discovery*	Hiroshi Tomoda (Graduate School of Pharmaceutical Sciences, Kitasato University) Jalifah Latip (School of Chemical Sciences and Food Technology, University Kebangsaan Malaysia) Muhammad Aswad (Faculty of Pharmacy, Universitas Hasanuddin) Moderator : Subehan / Andi Arjuna
04.00 – 04.30 p.m.	Coffee Break	Organising Committe
04.30 – 04.45 p.m.	Closing of Conference Day I	Organising Committe

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		• **Widya Ariati, Latifah Rahman and Sartini** *Antibacterial Synergy Combination of Purple Ginger (Zingiber cassumunar) and White Turmeric (Curcuma zedoaria) n-Hexane Extract Against Propionibacterium acnes* • **Ardiyah Nurul Fitri Marzaman, Nur Atika Nadya, Sartini Natsir, Subehan and Nana Juniarti Natsir Djide** *Modulation of Antibacterial Sensitivity of Aqueous Green Tea Extract (Camellia sinensis) and Aqueous Roselle Calyx Extract (Hibiscus sabdariffa) on Extended Spectrum B-Lactamase (ESBL) Producing Echerichia coli* • **Andi Arjuna, Julio Valentino Kentjem and Sartini Sartini** *Study on antibiofilm potency of green algae methanol extract against Staphylococcus aureus through microtiter plate assay* • **Muh. Azwar Ar, Herlina Rante, Natsir Djide and Gemini Alam** *Isolation and Antibacterial Activity Test of Endophytic Fungi XP 2 from Syzygium polyanthum* • **Besse Yuliana Prayitno Setiawan, and Husnil Ania** Formulation Mucous Snakehead Fish (*Channa Striata*) Emulgel Agent In Injury To The Establishment Fibroblasts Diabetes Mellitus • **Jaidayanti Basaruddin, Selpida Handayani, Fradiba Abdul Rasyid** Comparative study of flavanoid levels in sumbawa forest honey collected in the rainy and dry seasons using UV-Vis spectrophotometry
11.30 – 01.30 p.m.	**Jum'ah Prayer – Lunch**	**Organising Committe**
01.30 –02.00 p.m.	**Closing Ceremony and Awarding for Best Oral dan Poster Presentation**	**Organising Committe -** **Closing Ceremony by Dean Faculty of Pharmacy, Hasanuddin University**

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Abstract No. 080

Comparative study of flavanoid levels in sumbawa forest honey collected in the rainy and dry seasons using UV-Vis spectrophotometry

Jaidayanti Basaruddin[1], Selpida Handayani[1] and Faradiba Abdul Rasyid[1*]

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Abstract. Honey is a natural product been used as a medication. The research aimed to determine the flavonoid content of honey from Sumbawa forest collected in the rainy and dry season by UV-Vis spectrophotometry. The analysis of the flavonoid content used Thin Layer Chromatography (TLC). It produced a yellow-greenish spot using $AlCl_3$ reagent. Determining the flavonoid content of honey in the two seasons by UV-Vis spectrophotometry method with the maximum wavelength of 428 nm. The result of the research showed that the flavonoid content of the honey taken in the rainy season was 0.330 mgQE/g with the presentage of 33% whereas the honey in the dry season had 0.503 mgQE/g flavonoid level with the presentage of 50,3%. In conclusion, the flavonoid level of the honey taken in the dry season was higher than the honey taken in the rainy season.

Keywords: Honey, Flavonoid, Spectrophotometer

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69	Abstract No. 073	Formulation Mucous Snakehead Fish (*Channa Striata*) Emulgel Agent In Injury To The Establishment Fibroblasts Diabetes Mellitus Besse Yuliana, Prayitno Setiawan and Husnil Ania
70	Abstract No. 074	Formulation and Evaluation of Gel Ethanol Extract of Matoa Bark (*Pometia pinnata*) **Nurlina Nurlina**, Muzakkir Baits and Iskandar Zulkarnain
71	Abstract No. 075	Comprehend Study on antibacterial activity of earth-worm extract (*Lumbricus rubellus*) against Salmonella thypii **Nur Indah Yanti**, Nana Juniarti Natsir Djide, Miftahul Janna Dwi Hasmin and Maghfira Haerunnisa Harun
72	Abstract No. 076	TLC-densitometry analysis of vitexicarpin from aqueous extraction of *Vitex trifolia* leaves by microwave-assisted technique **Muhammad Raihan**, Gemini Alam, Jumriani Husnani, Ermina Pakki and Herlina Rante
73	Abstract No. 077	Isolation And Identification Of Γ-Oryzanol Compounds From Rice Brane-N-Hexan Extract (*Oryza Sativa* cv Ciliwung) Maryono, Netti Herawati, Meuthia Aulia Farhai Gaffar, Sartini Sartini, Aliyah Aliyah and Elly Wahyudin
74	Abstract No. 078	Effects of Moringa Honey Supplementation during Pregnancy on Weight and Pregnant Outcomes in Rats Veni Hadju, Syarifuddin, Pattola, Aulia Rahman, Budiaman, Aliyah, Muhammad Dasir and Sadapotto
75	Abstract No. 079	Extraction Carrageenan of Red Algae *Kappaphycus alvarezii* With Microwave-Assisted Extraction Method **Syaharuddin Kasim**, Ismail and Sarce
76	Abstract No. 080	Comparative study of flavanoid levels in sumbawa forest honey collected in the rainy and dry seasons using UV-Vis spectrophotometry Jaidayanti Basaruddin, Selpida Handayani and Faradiba Abdul Rasyid
77	Abstract No. 081	Drug Interaction In Type 2 Diabetes Mellitus With Obesity And Chronic Macrovasclar Complication

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Comparative Study of Flavonoid Levels of Sumbawa Forest Honey Collected in Rainy and Dry Seasons using UV-Vis Spectrophotometry

Jaidayanti Basaruddin[1], Selpida Handayani[1], and Faradiba Abdul Rasyid[1*]

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ABSTRACT

Honey has been used as an alternative medicine in Indonesia and contains flavonoid compounds. The research aimed to compare flavonoid content between honey from the Sumbawa forest in the rainy and dry seasons by UV-Vis spectrophotometry. The analysis of the flavonoid content used Thin Layer Chromatography (TLC). It produced a yellow-greenish spot using an AlCl3 reagent and determined the flavonoid content of honey in the two seasons by UV-Vis spectrophotometry method with a maximum wavelength of 428 nm. The result of the research showed the flavonoid content of the honey taken in the rainy season was 0.330 mgQE/g with a percentage of 33%, whereas the honey in the dry season had 0.503 mgQE/g flavonoid level with a percentage of 50,3%. In conclusion, the flavonoid level of the honey taken in the dry season was higher than in the rainy season.

Keywords : Honey, Flavonoid, UV-Vis spectrophotometry.

I. INTRODUCTION

Honey is a natural product produced by honey bees derived from flower nectar or plant secretions collected by honey bees, modified and stored in beehives for maturation (Johnson 2010). Honey has a variety of benefits including in terms of food, health and beauty. Honey contains many vitamins including Thiamin, Riboflavin and Niacin (Ajibola 2012). Honey also contains flavonoid compounds (Rio 2012).

Flavonoids in honey have various structures influenced by geography, sources, flower nectar, climate, management processes, and others. Flavonoids in honey are divided into three classes with similar structures: flavonol, flavon and flavanone. Flavonoids are considered necessary because they contribute to the honey's color, taste and aroma and their beneficial effects on health. In addition, the composition of flavonoids and honey's antioxidant capacity depends on the dominant flower source factor used to collect honey and depend on season and environment (Estevinho 2008).

Climate change can have a direct effect on the process of honey formation, the rainy season can affect the harvesting of honey, for example in the rainy season the nectar of flowers dilutes which causes no

sweetness so the bees do not want to suck the flowers. Otherwise, in the dry season the nectar production is reduced so that it affects the process of honey formation (Conte 2008). Nectar is a liquid that contains a lot of sugar and water (Soerodjotono 1992). Based on this, a study was conducted on testing the levels of flavonoids from forest honey from Sumbawa collected during the rainy and dry seasons.

II. RESEARCH METHOD

A. Sampling

Honey samples were taken directly in the forests of Sumbawa Regency based on the rainy and dry seasons. Then the sample were stored at room temperature in a dark place until is going to use for the research.

B. Qualitative Test

1. Thin Layer Chromatography (TLC) Test

Methanol was used to dissolve honey, then spotted on the TLC plate with a TLC of silica gel F254, then the TLC plate was placed in a chamber that contained chloroform: methanol (5: 5) eluent until it was eluted. After that the spots were observed under 254 and 366 nm UV light, then sprayed with AlCl3 which showed a greenish-yellow color.

2.

3. Color Test

Magnesium was added about 0.1 g to a two mL test solution. Then add ten drops of concentrated HCl and shake gently. Red-orange to red-purple (positive flavonoid) or orange-yellow (flavon, chalcone, Auron) will form..

C. Quantitative Test

Determination of flavonoid levels by UV-Vis spectrophotometry method that refers to the procedures of Chang et al (2002) and Ahmad AR et al (2014) with some modifications with quarsetin (QE) as standard.

1. Standard Solution Making

Quercetin, about ten mg, was dissolved in methanol p.a 10 mL to make 1000 ppm. Pipetted 1 mL and dissolved in 10 mL methanol p.a to make 100 ppm. Then series concentrations (10, 15, 20, 25, and 30 ppm) were made from the 100 ppm standard solution. Each concentration was added with 10 mL of methanol p. each concentration of the standard solution of a Quercetin 1 pipetted, then add 3 mL of methanol p.a, 0.2 mL of 10% AlCl 3, 0.2 mL of potassium acetate 1 M and added with aquadestillate to 10 mL. They were incubated at room temperature for 30 minutes. Absorbance was measured by UV-Vis spectrophotometry at maximum wavelength and then a standard Quercetin curve was made. The first run is run from a wavelength of 400-450 .

2. Determination of Flavonoid Level

2000 mg of honey was weighed and dissolved in 50 mL of methanol p.a. Then pipetted 1 mL and dissolved it in 10 mL methanol p.a to make a 4000 ppm concentration. 1 mL test solution (4000 ppm) added with 3 mL methanol; 0.2 mL 10% AlCl3; 0.2 mL potassium acetate 1 M and sufficient with 10 mL aquadestillate, then incubated for

30 minutes in a dark place with room temperature. Next, absorbance was measured by UV-Vis spectrophotometry at maximum wavelength. The sample solution was made in three replications so that the level of flavonoids obtained as quercetin equivalent (QE).

III. RESULT AND DISCUSSION

A. Research Result

Table 1. The **Qualitative test results for the rainy and dry season honey flavonoid compounds using thin layer chromatography (TLC)**

Sample	Color Reaction (reagent $AlCl_3$)	Result
Rainy-season Honey	Greenish-yellow	+
Dry-season Honey	Greenish-yellow	+

Note :(+) = positive flavonoid
(-) = negative flavonoid

Table 2. The Results of qualitative test of rainy-season and dry season honey flavonoid compounds by color test using powder magnesium (Mg) + concentrated HCl

Sample	Color (Mg powder + concentrated HCl)	Result
Rainy-season Honey	Yellow-orange	+
Dry-season Honey	Yellow-orange	+

Note : (+) = positive flavonoid
(-) = negative flavonoid

Table 3. The values of absorbance of quercetin solution as standard at maximum wavelength of 428 nm

Concentration (ppm)	Absorbance
10	0,392
15	0,477
20	0,572
25	0,682
30	0,810

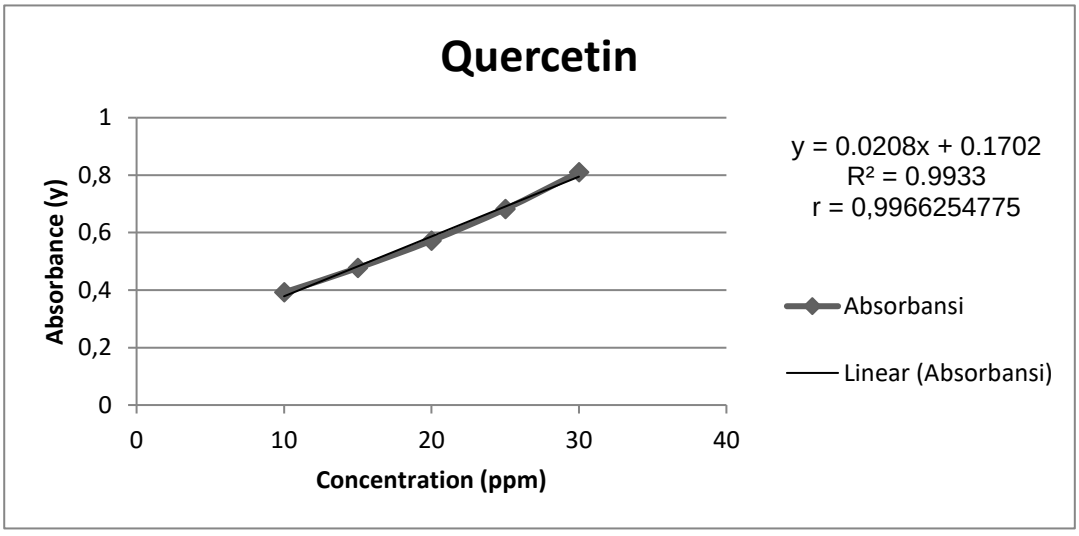

Figure 1. Quercetin calibration curves at maximum wavelength of 428 nm

Table 4. The Results of the determination of the Rainy-season honey flavonoid levels

Replication	Abs (Y)	Initial Flavonoid content (mg/L)	Total Flavonoid Content (mgQE/honey)	Average Flavonoid Content (mg QE/g honey)	% Total Flavonoid Content
1	0,311	0,0070	0,350		
2	0,304	0,0067	0,335	0,330	33%
3	0,293	0,0061	0,305		

Table 5. The Results of the determination of the Dry-season honey flavonoid levels

Replication	Abs (Y)	Initial Flavonoid content (mg/L)	Total Flavonoid Content (mgQE/honey)	Average Flavonoid Content (mg QE/g honey)	% Total Flavonoid Content
1	0,373	0,0101	0,505		
2	0,366	0,0098	0,490	0,503	50,3%
3	0,381	0,0105	0,525		

B. DISCUSSION

Honey is a thick liquid produced by honey bees from various nectar sources (Kusuma 2009). Honey is a bee product that has properties to produce energy, cure various diseases, increase endurance and stamina (Suranto 2004). Rio (2012) states that honey contains flavonoid compounds.

Flavonoids are natural phenolic compounds that are secondary metabolites. Plants use these compounds to produce red, purple, blue, and yellow dyes. Flavonoids have 15 carbon atoms in their structure, with two benzene structures connected to one propane chain to form a C6-C3-C6 arrangement. This arrangement can result in three different structures: 1,3-diarilpropan (flavonoid), 1,2-diarilpropan (isoflavonoid), and 1,1-diarilpropan (neoflavonoid) (Markham 1988). Due to the presence of flavonoid compounds in honey samples, the goal of this study was to use UV-Vis spectrophotometry to determine the levels of flavonoid forest honey from Sumbawa collected during the rainy and dry seasons.

The presence of chemical components in the sample was determined using the thin layer chromatography (TLC) method in a qualitative test. Table 1 illustrates this. Both the rainy and dry seasons of honey contain positive flavonoids that can be detected by AlCl3 reagents with a yellow-greenish color.

Flavonoid qualitative test using thin layer chromatography (TLC). Where TLC itself is a method of separating a compound based on differences in the distribution of two phases, namely the stationary phase and the mobile phase. The stationary phase used is silica gel F254, and the mobile phase is chloroform: methanol (5: 5). Subsequently the spot was observed under a UV light of 254 nm and a UV lamp of 366 nm showed an increasingly intensive greenish yellow stain after spraying with AlCl3 reagent. Which is due to the reaction between AlCl3 and flavonoids that form complex compounds in the 3 ', 4' ortho-dihydroxy group (Markham 1988). According to research conducted by Kurniasari (2006) states that a number of medicinal plants containing flavonoid compounds have been reported to have antioxidant, antibacterial, antiviral, anti-inflammatory, anti-allergic, and anticancer activities.

A qualitative test was also carried out a color test, in which rainy and dry season honey samples were added with 0.1 g of magnesium powder and 10 drops of concentrated HCl. From the color test results of the rainy and dry season honey, the color was yellow-orange, so

it can be seen that rainy season and dry season honey positive contains flavonoid. It can be seen in table 2. The color that occurs due to the reduction of magnesium and HCl concentrated against flavonoid compounds. According to research conducted by Suradji (2016) states that red-orange to red-purple (positive flavonoid) or orange-yellow (flavon, chalcone, auron) are formed.

For the quantitative test of flavonoid compounds using UV-Vis spectrophotometry was performed to find out how many flavonoid levels were contained in the rainy and dry season honey. UV-Vis spectrophotometry is a device used to measure the absorption resulting from chemical interactions between electromagnetic radiation with molecules or atoms of a chemical in the UV-Vis region (Dirjen POM 1995). The quantitative examination employs UV-Vis spectrophotometry because flavonoids contain a conjugated aromatic system with strong absorption bands in the ultraviolet and visible light spectrum regions (Rohyami 2008). Quercetin was used as a standard solution in this study to determine flavonoid content in the sample, with concentrations ranging from 10, 15, 20, 25, and 30 ppm. Because the method used to determine content is a method that uses a standard curve equation to create a standard curve in advance, several series of concentrations are made to obtain a linear equation that can be used to calculate percent. Since Quercetin is a flavonoid group of flavonols with a ketone group at C-4 and a hydroxyl group on C-3 or C-5 atoms that are neighbors from flavones and flavonoids and can form complexes with AlCl3, it is used as a standard solution. (Azizah and Faramayuda 2014, p. 48). To determine the level of flavonoids, first run the wavelength. Running results show that the maximum standard wavelength of Quercetin is at a wavelength of 428 nm. Furthermore, standard absorbance measurements were carried out with concentrations of 10, 15, 20, 25, and 30 ppm to obtain absorbance values for each concentration. Can be seen in table 3.

The absorbance value was then plotted against concentration to obtain a linear curve, as shown in Figure 1, resulting in the linear regression equation = y = 0.0208x + 0.1702 with R2 = 0.9933 and r = 0.9966, indicating good linearity. To compare the concentration of flavonoid compounds in rainy and dry-season honey samples, use the quercetin calibration curve equation. Quantitative testing with UV-Vis spectrophotometry employed a blank solution as a control, which serves as a blank (multiplies zero) compound that does not require analysis (Basset 1994).

Measured flavonoids by adding AlCl3 compounds in the sample . The complexes were established to provide a bathochromic effect by shifting the wavelength towards the visible, which is indicated by the solution showing a more yellow color. Moreover, the addition of potassium acetate is a stabilizer so that the bathochromic effects can be maintained (Chang 2002). The procedure was also performed to evaluate the flavonoid content for rainy and dry season honey by making three replications for data accuracy and keeping for about 30 minutes to make the reaction run perfectly. Hence, the intensity of the resulting color was apparent (Azizah and Faramayuda 2014).

Based on the study's results, flavonoid levels in the rainy season honey, 0.330 mg QE /g honey was obtained with a percentage of 33%. As for the dry season honey, flavonoid levels of 0.503 mg QE / g honey were obtained with a percentage of 50.3%. It can be seen in Tables 4 and 5. The results show that dry-season honey has higher flavonoid levels than rainy-season honey. The higher levels of flavonoid from dry season honey can be caused by the dry season honey being thicker than the rainy season honey because according to Rostinawati (2009) states that qualified honey has a high thickness; the thicker the honey, the better the quality. The bee puff type of flower can affect the compound of honey. The flower extract sucked by the bee makes the honey has various tastes, such as sweet or bitter. Bitter tastes in honey are caused by bees sucking the contents of a thicker essence at the end of the flower season (dry). Because according to Mulu (2004), differences in the types of plants

in which nectar becomes bee food to produce honey will affect the characteristics of honey, such as the aroma, color, and composition. According to Hariyati (2010), honey's chemical composition varies depending on the plant's source, the season and the production method.

CONCLUSION

Results of the research show that the flavonoid content of the rainy season honey is 0.330 mg QE / g honey with a percentage of 33% whereas the dry season honey is 0.503 mg QE / g honey with a percentage of 50.3%. The levels of flavonoids in the dry season honey are higher than in the rainy season honey.

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