JOURNAL OF SCIENCE INNOVARE
https://journal.unpak.ac.id/index.php/jsi
Volume 01, Number 02, September 2018, Page 40-43
p-ISSN: 2615-3769 ; e-ISSN: 2615-3750

THE TABLET FORMULATIONS EFERVESEN EXTRACT OF CINNAMON BARK WITH VARIATIONS IN THE TYPE OF SWEETENER

Septia Andini[a)], Erni Rustiani [a)], Dwi Indriati[a)]

[a)]*Universitas Pakuan, Bogor, Indonesia*
Corresponding Author: septiaandini85@gmail.com

Article history: received 15 Juli 2018; revised 14 Agustus 2018; accepted 01 September 2018

Abstract. Cinnamon Bark contains flavonoids, tannins, alkaloids, and phenols. Phenolic compounds contained in cinnamon is a sinamat acid is effective as anti diabetic. This research aims to determine the formula preparations tablets efervesen extract of cinnamon bark with a certain type of sweetener that favored the panelists and the levels of sinamat acid in efervesen tablets and extracts. The formula is made with different types of sweeteners such as aspartame stevia 1.5%, 3.5% and 1% sukralosa. The results of the analysis showed no difference in sweeteners influence against the parameters of color and scent but the effect on the parameters of taste every formula. Formula tablets efervesen extract of cinnamon bark that is favored by panelists based on based on the parameters of taste is formula 1 with the sweetener aspartame concentration of 1.5% and a formula 3 with sweetener sukralosa concentration 1% preferred formula panelists. The results of the analysis of the levels of sinamat acid in extract of cinnamon bark obtained the level of 471, 13 mg/g as for Formula 1 tablet efervesen acquired the levels of 369.76 mg/gram

Keywords: cinnamon bark, efervesen, sinamat acid tablets

I. INTRODUCTION

Cinnamon (Cinnamomun burmannii) is a green leafy plant that originated in southern China, which is now widely grown in Southeast Asia such as Indonesia, Laos, and Malaysia. Cinnamomum burmanni is one type of cinnamon extracts have the potential to antidiabetik directly. Cinnamon bark is known to be used for the treatment of diabetic [1]. Cinnamon is reported to have shown to have hypoglycemic effects in mice of diabetes. Based on the research of Alfisyahrin [2], tablet extracts dry bark of cinnamon shown to lower blood sugar levels in Sprague dawley male rats with the treatment for 18 days, with an effective dose as lowering blood sugar levels was 7.56 mg/200 g BB. This research note that Cinnamon Bark contains sinamat acid, dried bark extract to get the cinnamon sticks using the method of maceration with solvent ethanol 96% bark of cinnamon. Based on the research of Alfiani [3], 96% ethanol extract of bark of cinnamon has a relative levels of sinamat acid (151.362 mg/g dry extract).

Efervesen tablet is a tablet that produce CO_2 gas as a result of the reaction of organic acids and alkaline carbonate with liquid pelarutnya [4]. The advantage of this form of preparation is an efficient, easy set-up solution containing a dose of the right medicine so easily diabsorpsi by the body. Tablet efervesen also produce a delicacy because of carbonate that help improve the taste of the typical kulitbatang of cinnamon extract [4]. Source of carbonic acid and can produce a good efervesen when each is used in a concentration range of 25-40% of the weight of the tablet. The research of manufacture of efervesen tablet formula has been done by Kusumawati [5] uses a combination of natural extracts of broccoli and pegagan formula of sodium bicarbonate with 38.20%, 12.56% of citric acid and acid tartrate of 25.1%. On the research already done variations of this type of sweetener aspartame that is 1.5%, 3.5%, and stevia sukralosa 1%. Consideration of the use of variety types of sweeteners so that panelists prefer and can mask the taste and smell at the stem bark extract is sweet. This research aims to determine the formula preparations tablets efervesen extract of cinnamon bark with a certain type of sweetener that favored the panelists and the levels of sinamat acid in efervesen tablets and extracts.

II. RESEARCH METHODS

Tools and Materials

The tools used in this research include: the Brown bottle 1000 ml, sieve mesh 16 and 30, oven, furnace, analytic scales, moisture balance (AND MX-50®), the rotary evaporator (IKA®), vacuum dryer (OGAWA®) and UV-VIS spectrophotometer (GENESYS®), tools print tablets (KORSCH), caliper (KENMASTER), flow meters, bulk density tester (TDT-1 h), hardness tester (YD-1), friabilator tester, stopwatch (Casio), as well as other glass instruments.

The materials used in this research is the cinnamon bark obtained from kemang, bogor, ethanol 96% (Merck), akuades, citric acid (Brataco), acid

Volume 01, Number 02, September 2018, Page 40-43
p-ISSN: 2615-3769 ; e-ISSN: 2615-3750

tartrate (Merck), sodium bicarbonate (Brataco), Poly Vinyl Pirolidon (PVP) (Merck), lactose (Bratachem) (Brataco), aspartame, Stevia Powder (Bratachem), Sukralosa (Brataco), Mg of stearic Acid (Brataco), sinamat (Sigma®).

Manufacture Of Dry Extract Of Cinnamon Bark

Making cinnamon bark extract is done by maceration using solvent ethanol 96% by comparison 1:10 for 3 days. Each filtrate obtained dried extracts made using vacuum dryer (OGAWA ®). Testing the quality of extract of cinnamon bark include organoleptic test, moisture content and test levels.

Analysis of Sinamat Acid levels of dry Extract of Cinnamon Bark

Analysis of sinamat acid levels include the determination of wavelength calibration curve, the making and determination of sinamat acid levels in accordance with the literature. (Vy Thuy Truong). Pembuatan Tablet Efervesen Kulit Kayumanis.

Tablet efervesen bark cinnamon is made in 3 formula with different types of sweeteners such as aspartame stevia 1.5%, 3.5%, and 1% with sukralosa weight per tablet is made of 4 grams. Preparations made as many as 250 tablets for each formula (table 1).

Table 1. Formula preparation tablets efervesen

Material	Total Materials			Function
	FI (%)	F2 (%)	F3 (%)	
Dry skin Extract Cinnamon Sticks	7,5	7,5	7,5	Active
Tartrat Acid	25,1	25,1	25,1	Acid resource
Natrium Bikarbonat	38,20	38,20	38,20	Base resource
PVP	5	5	5	Fastener
Aspartam	1,5	-	-	Sweetener
Stevia	-	3,5	-	Sweetener
Sukralosa	-	-	1	Sweetener
Mg. Stearat	1	1	1	Lubricant
Laktosa ad	100	100	100	Filler

Acid components are made of dry extract of portion of skin menghomogenkan cinnamon sticks, then mixed with citric acid and acid tartrate, most binding solution, lactose and crushed to form a mass that can be is lumped and dried in the oven and then sifted using a 16 mesh sieve.

The alkaline components made by mixing sodium bicarbonate, sweetener (aspartame, stevia, sukralosa), dried extract of cinnamon bark have first dihomogenkan and partially lactose into one container, then crushed and sifted with sieve 16. The components of the base mesh and the acid component it is dry then put together in one container and dihomogenkan to produce efervesen granule. After efervesen granule is formed, then conducted an evaluation of efervesen granule. Then do the addition of stearic magnesium and ready for printing tablets.

Evaluation Of Skin BatangKayu Sweet Efervesen Granule

Evaluation of the quality of granule efervesen include organoleptic test, the flow rate, the angle rest, kompresibilitas in accordance with the literature test [4].

Evaluation Of Efervesen Tablet Quality

Physical quality test efervesen tablets that do include organoleptic test, the uniformity of weights [6], test the hardness of tablets [7], test the fragility of tablets (Voigt), a late time trials (Siregar), test a fondness and the determination of the levels of acid sinamat.

Test Your Favorites (Hedonik)

Test the response of flavor, color and aroma is done with sampling techniques with heterogeneous populations of a number of 20 respondents with more than 30 years of age each respondent get the same opportunity to experience a sample of the numerous formula efervesen tablets dissolved in 200 ml of water. The best favorites of test results of a test done formula determination of sinamat acid levels.

Test The Levels Of Acid Sinamat In Efervesen Tablet

The determination of the levels of sinamat acid in tablet efervesen extract of cinnamon bark was done in a way to make a test solution. Determination of sinamat acid levels is done using UV-VIS spectrophotometer (GENESYS ®) and acquired its absorbance values.

III. RESULTS AND DISCUSSION

Analysis of dried extract of cinnamon bark

Dry extract of cinnamon bark has a reddish brown color, a distinctive strong aromatic odor, spicy and slightly sweet taste. The dried extract obtained was in accordance with the characteristics stated in the Indonesian Ministry of Health (2009). Results of water content obtained from cinnamon bark extract powder of 6.28%, the requirements for the water content of Simplicia powder, in general, are not more than 10% (Ministry of Health, 1989). The ash content of cinnamon bark extract was 3.22%. The level of extract ash according to the Ministry of Health (2009) is less than 3.5%. These results indicate that the ash content in the bark of cinnamon meets the requirements.

Analysis of Cinnamon Bark Granules

Dry granules extract cinnamon bark has a reddish brown color, strong aromatic odor, sweet taste (Figure 1). The results of efferent effluent granules in formula 1 (4.32%), formula 2 (4.49%) and formula 3 (4.57%). These results meet the requirements of the efferent granule moisture content of no more than 5% [8].

The results of testing granule flow rate indicate that granules have easy flowing properties in formula,

Volume 01, Number 02, September 2018, Page 40-43
p-ISSN: 2615-3769 ; e-ISSN: 2615-3750

while formulas 2 and 3 have slightly cohesive properties according to Aulton [9]. Cohesive properties are caused by more moist granules so that the flow rate is inhibited.

The results of resting angle testing showed that all formulas had a resting angle with very good criteria according to Aulton [9] and the granular compressibility results in formula 1 to formula 3 showed good results. According to Wells (1987), the criteria for good granule compressibility ranged from 12-16%.

Figure 1. Efervesen Granule

Analysis of effervescent tablets of cinnamon bark

The effervescent tablet is printed in a room with a relative humidity of 25% and a temperature of 20˚C. Physical evaluation of effervescent tablets was carried out to determine the quality characteristics of effervescent tablets produced. The effervescent tablet has a reddish brown color, a strong aromatic aroma, sweetness (figure 2). The results of the effervescent tablet physical evaluation can be seen in Table 2.

Table 2. Result of physical evaluation of efervesen tablet

Characteristic Granul	Formula 1 (X±SD)	Formula 2 (X±SD)	Formula 3 (X±SD)	Requirement/ literature
Weight uniformity (g)	4,0242 ± 0,0102	4,0234± 0,0113	4,0185±0,0082	FI Edition III
Violence (Kp)	10,72 ± 0,0140	11,41 ± 0,0140	10,3 ± 0,14	4 – 10 kp (Sulaiman, 2007)
Fragility (%)	0,1818 ± 0,0072	0,4078 ± 0,0196	0,1390 ± 0,0348	nner et al, (1981)
Dissolution time (minute, second)	3,37 ± 0,014	5,03 ± 0,014	2,07 ± 0,014	5 minute (Council of Europe, 1997)

Formula 1 Formula 2 Formula 3

Figure 2. Efervesen Tablet

Weight uniformity

Tablet weight uniformity is an important factor that determines the uniformity of active ingredients in tablets that influence the uniformity of the therapeutic effects of these tablets. The resulting test showed that the three efferent tablet formulas met the requirements based on Pharmacopoeia Indonesia edition 3 [6], there were no 2 tablets whose weight deviated from the average weight of ≥ 5% and no one tablet whose weight deviated was greater than 10%.

Tablet hardness test

Tablet hardness test was carried out to determine the resistance of the tablet to mechanical shocks during manufacture, packing, and distribution. Generally, good tablets are stated to have a hardness between 4-10 up. But this is not absolute, tablet hardness greater than 10 km can still be accepted if it still meets the requirements of the time of destruction or the required dissolution time (Sulaiman).

Tablet Fragility Test

Tablet brittleness testing is done to measure the strength of tablets that are easy to be broken and scratched during packaging, shipping, and storage and can cause impurities in the transport and packing area which will cause variations in the weight and uniformity of tablet content so that the tablet is not suitable for sale. Tablet failure conditions are based on Fonner et al [10], which is 1%.

Dissolution Test Time

The dissolution time of efferent tablets from each formula has a different time which is caused by the processing time is done manually, the ingredients are mixed for carbonation (acid and base components) and other imperfect additives. According to literature, the effervescent tablet dissolves in 5 minutes [11].

Sinamat acid content

Analysis of cinnamic acid levels was carried out based on the hedonic test. The aim of this test was to determine the differences in the amount of cinnamic acid contained in effervescent tablets of cinnamon bark compared to extracts of cinnamon bark.

The results of the analysis of cinnamic acid levels in efferent tablets 369.76 mg / g and 471.13 mg / g for sweet cinnamon extract. Efferent tablets have decreased cinnamic acid levels by 21.51%. It is expected that the cinnamic acid contained in the tablet is synthesized by acidic and basic sources so that the obtained decreases. Decreased levels are also likely to occur due to the degradation of the active ingredients which are alkaline slowly due to changes in temperature, air, and light.

Favorite analysis statistical test

The preferred test was carried out on effervescent tablets which had been dissolved in 200 ml of water. The preference test was carried out on the color, aroma and taste parameters of the three effervescent tablet drink formulas. Tests carried out by 20 panelists aged over 30-40 years because effervescent tablets are intended for the prevention of diabetes. Data from questionnaires filled out by panelists were processed using the SPSS 17. The test results of preference can be seen in Table 3.

Volume 01, Number 02, September 2018, Page 40-43
p-ISSN: 2615-3769 ; e-ISSN: 2615-3750

Table 3. Favorite test

Formula	Average		
	Color	Taste	Smell
F1	$3,05^{a}$	$3,65^{b}$	$2,85^{a}$
F2	$2,80^{a}$	$2,50^{a}$	$2,85^{a}$
F3	$2,95^{a}$	$3,30^{b}$	$2,85^{a}$

The same letter in the superscript in the same column shows results that are not significantly different. Duncan's further test results show the type of sweetener affects the taste parameters. Formula 1 with aspartame sweetener has the same taste as formula 3 with sucralose sweetener while for formula 2 stevia sweetener has a different taste. Based on the results of the concentration statistics and the type of use of different sweeteners it does not affect the color and aroma parameters but affects the taste parameters.

IV. CONCLUSION

a. The formula of efferent tablet extract of cinnamon bark favored by panelists based on taste parameters was formula 1 with sweetener aspartame concentration of 1.5% and formula 3 with sweetener sucralose concentration of 1%
b. The cinnamic acid content of the bark extract is 471.13 mg / g and in efferent tablets is 369.76 mg/g.

Acknowledgement

Acknowledgments the authors say to the Pakuan Siliwangi Foundation that has provided financial assistance so that this research can run smoothly.

REFERENCES

[1] Gunawan, D., Mulyani, S.2004. *Ilmu Obat Alam(Farmakognosi)* Jilid I. Penebar Swadaya,Jakarta.
[2] Alfisyahrin, N. M., Moerfiah., Rustiani, E. 2013. Efektivitas Sediaan Tablet Ekstrak Kulit Kayu Manis (*Cinnamomum burmanii*) sebagai Antidiabetes pada Tikus Putih Jantan Galur *Sprague dawley* yang Diinduksi Aloksan. *Skripsi*. Fakultas Matematika dan Ilmu pengetahuan Alam. Universitas Pakuan : Bogor.
[3] Alfiani, N., Wardatun, S., Rustiani, E. 2017. Study Effect Type of Extraction Method and Type of Solvent to Cinnamaldehyde and Trans-Cinnamic Acid Dry Extract Cinnamon (Cinnamomum burmanii [Ness & T, Nees] Blume.). *Skripsi.* Fakultas Matematika dan Ilmu pengetahuan Alam. Universitas Pakuan : Bogor.
[4] Lachman, L. Lieberman, H. A. Kanig, J. L. 1994. *Teori dan Praktik Farmasi Fisik* Edisi III. Jakarta : UI Press.
[5] Kusumawati, Y., Rustiani, E., Almasyhuri. 2017. Pengembangan Tablet Efervesen Kombinasi Brokoli dan Pegagan dengan Kombinasi Asam dan Basa. *Skripsi.* Fakultas Matematika dan Ilmu pengetahuan Alam. Universitas Pakuan : Bogor.
[6] Dep.Kes. 1979. *Farmakope Indonesia* Edisi III. Jakarta: Departemen Kesehatan Republik Indonesia.
[7] Ansel, H.C. 2005. *Pengantar Bentuk Sediaan Farmasi*. Edisi IV. Alih Bahasa. Farida Ibrahim. Jakarta: UI Press.
[8] BPOM. 2014. Peraturan Kepala BPOM RI No.12 tahun 2014 tentang Persyaratan Mutu Obat tradisional. Jakarta.
[9] Aulton, E. M. 1988. *Pharmaceutics Science of Dosage Form Design*. London: Churcill Living Stones. Hal 247-312
[10] Fonner, D.E., Anderson, N.R., Banker, C.S., 1981. Granulation and Tablet Characteristic in Liebermen, H.A., Lachman, L., (eds) *Pharmaceutical Dosage Form : Tablet, Vol.2* Mercel Dekker Inc. New York. 226-231
[11] Council of Europe. 1997. *European Pharmacopoeia Third Edition*. Strasbourg. Hal.1753.