

**BANGUN-BANGUN TABLET FORMULATION WITH PVP K-30 AS TABLET BINDER****\*Nisa Najwa Rokhmah, Erni Rustiani, Dina Indrawati**

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**ABSTRACT**

Bangun-bangun leaves is one of Indonesia heritage plants used for medicine and days consumption. There are some research with bangun-bangun leaves have already conduct to get the best formulation and effectivity. The objective of this study is to produce bangun-bangun tablet with PVP K-30 variation concentration as a binder and decide the best formula. The quality of the tablet is measure by organoleptic, weight, size, friability, hardness, and disintegrating time. The result of this study all of the formula come with the good quality. Hardness test of the tablet showed some of them under the recommendation range.

**KEYWORDS:** Bangun-bangun leaves, tablet, PVP K30.**INTRODUCTION**

Bangun-Bangun leaves is one of Indonesia plants used by North Sumatra people especially women whose already deliver baby, to increase the quality and quantity of breast milk. This plants contain some phytochemical compound for example phenol and flavonoid (Hole dkk., 2009). Bangun-bangun leaves contain vitamin C, vitamin B1, vitamin B12, beta karoten, niasin, karvakrol, calsium, fatty acid, and fiber. Biologic activity of these plants is for diuretic, analgesic, anti inflammation, prevent cancer, anti tumor, anti vertigo, stimulate immune (Roshan DP *et al.*, 2010).

Consumption of bangun-bangun powder as much as 750mg on a day can decrease cholesterol by 2,31mg/dL. Based on that research extract bangun-bangun tablet already made for making patient easier use medicine (Andriani, 2012). The best tablet formulation with 114,7 mg bangun-bangun extract and PGA 3,5% as binder (Rikkit, 2017).

Another research showed dose of bangun-bangun tablet effective to decrease cholesterol total on rat by day 15<sup>th</sup> and statistically 5,8 mg/200g dose has te equal effect with control positive (simvastatin) (Elis, 2018). According to that research, optimization of tablet is needed is needed by increase dose of bangun-bangun per tablet from 114,7mg to 230 mg.

PVP is one of binder agent that can used in tablet formulation. Concentration 0,5-2% would produce tablet with enough hardness, minimum friability and long disintegration time (Setyarini, 2004). Research on extract dewa leaves tablet found 1,5% PVP has a good physical

quality and filled Pharmacope criteria. This research will produce tablet with variation of PVP K-30 concentration.

**MATERIAL AND METHODS****Material**

Digital measurement (AND G-120<sup>®</sup>), oven (memmert<sup>®</sup>), jangka sorong (Tricle<sup>®</sup>), Tap Densitymeter (USP 315-2E Bulk Density Tester<sup>®</sup>), sieve mesh 30, mesh 12, mesh 8, Flowmeter, stopwatch, alat pencetak tablet (Korsch<sup>®</sup>), Friability Test (Panjaya Teknik<sup>®</sup>), Hardness Tester (Erweka THB28<sup>®</sup>), deksikator Disintegration Tester obotol coklat 1000 ml, oven, tanur, analytical measure, moisture balance (AND MX-50<sup>®</sup>), rotary evaporator (IKA<sup>®</sup>), vacuum dryer (OGAWA<sup>®</sup>) dan spektrofotometer UV-VIS (GENESYS<sup>®</sup>). Simplisia bangun-bangun leaves, PVP K-30, Amylum Manihot, PGA, Avicel PH 102, Ac-di-Sol, Talk, dan Mg Stearat.

**METHODS**

Dry extract bangun-bangun leaves is formulated with three different composition (table 1) and made with wet granulation way.

**Table 1.**

Additional substance	Formula (%)		
	I	II	III
PVP K-30	1	2	3
Ac Disol	3	3	3
Mg Stearat	1	1	1
Ac Disol	0,5	0,5	0,5
Talk	2	2	2
Avicel PH 102 add until	100	100	100

Tablet evaluation consist of: size uniformity, weight uniformity, time disintegration, and friability test.

## RESULT AND DISCUSSION

### Phytochemical test Result

Chemical compound	Result
Flavonoid	+
Tanin	+
Saponin	+
Alkaloid	+

Phytochemical test by another study showed the same result, bangun-bangun leaves extract contain flavonoid, tannin, saponin, and alkaloid (Annisa, 2015).

### Granul Evaluation

Granule water concentration test is conducted to detect the remain water after drying process. Result of this study is around 3% which is fulfilled the criteria made by Hadisoewignyo dan Fudholi (2013) ideally 3-5%. Granule flow test result from 3 formulas are >10g/second, it meets the criteria by Aulton (1998) flow freely. Resting angle test from the formulas less than 250, as on the table 2. This result meet flow characteristic criteria by Aulton (1998).

### Tablet Evaluation

Tablet evaluation is for knowing quality of tablet by conduct some parameter test: weight uniformity, size uniformity, hardness, friability, and disintegration time.

Weight uniformity test is used for measure average weight of each tablet. Weight uniformity of all tablets meet the criteria range 5% and 10% (DepKes RI, 1979).

Size uniformity test is used for measure thickness and diameter tablet. All oh the formula meet the criteria, less than 3 times tablet thickness and more than 1/3 tablet thickness(DepKes RI, 1979).

Hardness test function is to measure tablet hardness. Its really important because every tablet should be hard to prevent any defect from distribution process but easy to dissolved on body. Result test of the formula meet the range around 4-8kp (Parrot, 1971). Some tablets on each formula has hardness less than 4kp. Tablets under 4kp would have fragile structure. Tablets with highest hardness is from formula 2 with PVP K30 2%, but its still under 10kp.

Friability test is used for measure the endurance of tablet from rubbing on distribution and production process. All of the formula meet the criteria by Lachman and Lieberman (1994) friability between 0,8%-1%.

Time disintegration time test is used for measure tablet disintegration time on body because tablet need it before active compound being absorbed in digestive tract and give the therapeutic effect. Formula on this study meet

the criteria by DepKes RI (1995) with disintegration time less than 15 minutes.

## CONCLUSION

PVP K-30 as a tablet binder on formula I, II and III with concentration variation produce good quality of tablet and all of the formula meet the criteria, unless on hardness test some of the tablet less than expect value.

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