

Capacity of Antioxidants and Flavonoids Simplicia *Pegagan* Leaves Powder (*Centella asiatica* (L.) Urban)

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Abstract. *Pegagan* (*Centella asiatica* (L.) Urban) is a herbal plant which is based on preclinical testing showed has an activity to increase intelligence through an antioxidant mechanism. The purpose of this research were to determine the effect of treatment blanching and drying methods on antioxidant activity, total phenolic content, total flavonoid content of *Pegagan* leaves. *Pegagan* leaf treatment consist of 2 factors, pretreatment (blanching, non blanching) and drying (oven, sunlight). The results of the study simplicia *pegagan* leaf powder has a value of total phenolic content from 124.98 to 219.45 mg GAE / 100g, total flavonoids content from 131.67 to 196.74 mgEK / 100g, and the antioxidant activity from 138.72 to 310.72 mgGAEAC / 100g. Blanching treatment at a temperature of 80°C for 60 seconds and drying in an oven at 50°C for 3 hours provides the highest antioxidant capacity value 310.72 mgGAEAC / 100g, total phenolic content 219.45 mg GAE / 100g, total flavonoid content 196.74 mgQE / 100g.

Keywords : *Pegagan* leaf, blanching, drying methods, antioxidant activity, flavonoid.

I. INTRODUCTION

Plants and herbs contain phytochemicals like polyphenols compounds, flavonoids and tannins, which is a natural antioxidant compounds results secondary metabolites. Examples of antioxidant compounds in daily diet can inhibits the activity of free radicals that can trigger many diseases and show a variety of biological effects such as antiaging, antimutagen, and prevent the influence of oxidative stress (Rao, et al., 1996). *Pegagan* leaves (*Centella asiatica* (L.) Urban) one of the medicinal plants that supposedly can improve memory and brain ability. *Pegagan* strengthens brain function by way of conduction of nerve shock streamline, improve intelligence and memory (Rao et al., 2005). Pre test results of empirical claims supporting the clinic is on the giving of extracts water, methanol extract, and chloroform extract in mice showed that the water extracts activity to boost intelligence through the mechanism of antioxidants (Kumar and Gupta, 2002).

Development of natural antioxidant products as *pegagan* requires the availability of raw materials continuously, fresh raw materials has the potential to produce high antioxidant yet continuity the availability of continuous hard materials is assured. In addition, the raw material in the form of fresh has a shelf life that is lower than the drying form. Provision of simplicia

pegagan in powder form is very good the attempted to address, in addition to increasing the continuity of availability of powdered products, *pegagan* simplicia *pegagan* more easily applied in food products such as drinks, syrups, biscuits, bread and ice cream, either as natural dyes and as a source of antioxidants.

Pegagan as food sources of antioxidants are sensitive to light and heat, therefore *pegagan* processing into powder simplicia should be excluded from the various factors that can decrease its activity. The drying method is simply divided into two i.e. drying by sunlight and drying oven, both of these methods have drawbacks and advantages, but drying methods that can keep the quality of the product and antioxidants powder simplicia need further attempted.

Preliminary treatment (blanching) made before the drying process plants and herbs that aims to prevent the occurrence of Browning reactions due to the presence of oxidase enzyme activity in the network were destroyed (Desrosier, 1988). In general the blanching process aiming to stage the mengnonaktifkan enzyme polifenoloksidase. Blanching treatment towards turmeric white gives a positive kolerasi to increased antioxidant activity, levels of total phenols, flavonoids and total levels of condensed tannins (Pujimulyani, et al. 2010). Based on this, then this research aims to know the influence of drying

method and blanching treatment against the levels of flavonoids and antioxidant activity of powder simplicia *pegagan*.

II. RESEARCH METHODS

Research on the making process of powder simplicia leaves *pegagan*, consists of two treatments i.e. preliminary treatment (blanching and non-blanching) and the method of drying (pengovenan temperature of 50°C and sun-drying). The experimental design used was randomized design with factorial pattern group first factor i.e. preliminary treatment (2 levels) and the second factor is the method of drying (2 levels), each treatment was repeated four times so that the retrieved 12 units of the experiment. Data were analyzed with the analysis range (ANOVA) and test with the Duncan Multiple Range Test (DMRT) with the SPSS 1.70.

Tool

The tools used, namely baking sheet, 60 mesh sieve (Retsch), blender (Philips), aluminum foil (Klin Pack), mortar, pipette volume (Pyrex), measuring cup (Pyrex), micro pipette (Socorex), oven (Cole Parmer) UV-Vis spectrophotometer (UV-Vis 10S Genesys), funnel, filter paper of glass (Pyrex), analytic scales (Shimadzu), vortex (Maxi Mix II Type 367000), aluminum Cup, beaker (Pyrex), thermometer and quisioner paper.

Ingredients

The raw materials used are leaves fresh *pegagan* obtained in Blah Batuh-Gianyar. The chemical sodium bicarbonate (Na_2CO_3) (Merck), Folin cioccalteu (Merck), 1.1-diphenyl-2-picryl hydrazyl (DPPH) (Sigma-aldrich), methanol (Merck), ethanol (Merck), water, aquades, error acid (Merck), KIO_3 (Merck), I2 (Merck), 2.6-dikhlorofenol indofenol (Merck), HPO_3 (Merck).

Research Procedures

Pegagan leaves washed clean, then treated the blanching temperature of 85°C for 2 minutes and not diblanching. Next is dried at a temperature of 50°C for 4 hours, crushed and sifted by using the sieve 60 mesh. On a drying treatment with Sun dried leaf simplicia under sunlight for 4 days. Simplicia powder leaves obtained will be analysed the content of total phenols (Folin-Ciocalteu Method (Makkar et al, 2007)), the total flavonoids (Meda et al, 2005), antioxidant activity (DPPH method (Shim and Lim, 2009)).

III. RESULT AND ANALYSIS

The Result

Based on the results of the analysis of the value of the average moisture content (table 1), and drying blanching treatment produces powdered simplicia *pegagan* leaves

between 12.82 14,76% to%. Drying treatment of sunshine, non blanching water content highest value generating namely 14,76%. Drying treatment of sunshine, non blanching water content highest value generating namely 14,76%. Pengovenan treatment, non blanching produces the lowest moisture content values i.e. 12,82%. The results of the analysis of the average value of powdered phenol levels simplicia *pegagan* leaves ranged from 124.98 mgGAE/100 g up to 219.45 mg GAE/100 g. Pengovenan, blanching treatment gives the highest total value of phenol that is 219, 45 mgGAE/100 g (Table 1).

The average value of the levels of flavonoids and antioxidant capacity can be seen in table 2. Pengovenan treatment, blanching the highest antioxidant capacity value i.e. 310.72 mgGAEAC/100 g. The average value of the antioxidant capacity of powder simplicia *pegagan* been 218.30 mgGAEAC up 310.72 mgGAEAC/100 g/100 g. The average value of the levels of flavonoids from simplia *pegagan* powder by drying and blanching treatment/non blanching is in the range 131.67 mgQE 196.74 mgQE up/100 g/100 g).

The discussion

Determination of the moisture content aims to find out the amount of water content in the powder after the drying process simplicia. High low moisture content of a material effect on retention of the material. Draining treatment with sunlight produces relatively higher water levels than on the treatment of pengovenan due to the nature of the heat generated by the sun drying is not constant and there is no setting the humidity of the air.

Total phenol from powder simplicia *pegagan* leaves tend to be higher at a preliminary blanching treatment, this was allegedly due to blanching treatment aims to mengnonaktifkan enzyme polifenoloksidase. Blanching treatment towards turmeric white gives a positive kolerasi to increased antioxidant activity, levels of total phenols, flavonoids and total levels of condensed tannins (Pujimulyani, et al. 2010). Increased levels of total phenols degradation occurs due to the tannins are alleged to be the simpler phenols compounds (Pujimulyani, et al., 2010). Increasing levels of phenol due to blanching process also occurs on the research of Roy et al (2009) an increase in the levels of phenol in fresh broccoli 135.66 mgEAG/100 g be 144.33 mg/100 g after blanching for 5 minutes.

Antioxidant capacity during blanching allegedly occur due to changes in less-active being active compounds (Pujimulyani, et al., 2010). The levels of total flavonoid powder simplicia *pegagan* leaves relatively higher on pengovenan, blanching treatment namely 196.74 mg/100 g of QE. Pujimulyani, et al. (2010) States increased flavonoids flavonoids.

Table 1. Influence of blanching and drying method of treatment against the value of the average moisture content and levels of phenolic powder simplicia *pegagan* leaves.

Treatment	Moisture content (%)		Phenol content (mg GAE /100g)	
	Oven	Sun dry	Oven	Sun dry
Blanching	13,41	13,28	219,45	196,72
Non Blanching	12,82	14,76	137,57	124,98

Table 2. Influence of blanching and drying method of treatment against the average value of the levels of flavonoids and antioxidant capacity of powder simplicia *pegagan* leaves.

Treatments	Antioxidant capacity (mgGAEAC/100g)		Level of Flavonoids (mg QE /100g)	
	Oven	Sun Dry	Oven	Sun Dry
Blanching	310,72	218,30	196,74	157,35
Non Blanching	306,39	266,09	131,67	167,69

glycosides form due to alleged hydrolyzed into aglikon. Subsequent increased levels of flavonoids on turmeric white after blanching supports increased antioxidant activity than fresh. This is because flavonoids compounds can act as an antioxidant that is able to capture free radicals (Pujimulyani, et al., 2010). Sun drying treatment take a long time (4 days) so as to cause a decrease in the content of flavonoids and fenolase. This is allegedly due to the decomposition of fenolat compounds by enzyme fenolase aid contained in plants.

IV. CONCLUSIONS

Blanching treatment (temperature 80°C, 60 seconds) and drying oven (temperature of 50°C, 3 hours) produce the powdered leaf antioxidant capacity value *pegagan* highest 310.72 mgGAEAC/100 g, phenol levels 219.45 mg GAE/100 g, and the levels of flavonoids 196.74 mg/100 g of QE.

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