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MAKING AND CHARACTERIZATION OF PEGAGAN DRY EXTRACT (*Centella asiatica*) AS FEED ADDITIVES FOR ANIMAL FEEDING

Jhondri JHONDRI[1], Abun ABUN[1], Kiki HAETAMI[2]

[1]Faculty of Animal Husbandry, Padjadjaran University, Jalan Raya Bandung-Sumedang KM. 21, 45363, Sumedang-West Java, Indonesia, (phone) +6222 7798241, (fax) +6222 7798212.
[2]Faculty of Fisheries and Marine Science, Padjadjaran University, Jalan Raya Bandung-Sumedang KM. 21, 45363, Sumedang-West Java, Indonesia, (phone) +6222 7798241, (fax) +6222 7798212.

Corresponding author email: cjhondri@yahoo.co.id; abunhasbunap@gmail.com

Abstract

The research on the manufacturing process and characterization of Centella asiatica dried extract by adding lactose was carried out. The ratio of "pegagan" extract to lactose is 2: 1; 1: 1; and 2: 3. Products in the form of dry extract can be used as feed additives in poultry feed formulas. The results showed that the ratio of "pegagan" extract to lactose in the ratio of 2: 1, obtained the best dry extract "pegagan"flour character. The results of the characterization of dried "pegagan" extract are: shrinkage levels of 1.52%, total ash content of 1.17%, acid soluble ash content of 0.95%, water soluble compound content of 83.32% and organic solvent soluble compound content of 13.01%. Based on the results of the characterization test, "pegagan" dry extract flour can be classified as a feed additive in poultry feed formulas.

Key words*: Extraction, pegagan, lactose, additive feed, characterization.*

INTRODUCTION

Rations are generally in the formulation of feed ingredients produced by agricultural waste and agro-industry, because agricultural products are prioritized for the food sector. Nearly 60% of feed ingredients come from agricultural waste and agro-industry. Ingredients that are formulated, in composition contain various chemical compounds which in the process of digestion will have character as an anti-nutrient, resulting in decreased productivity of livestock. In order to overcome or compensate for these conditions the feed additives need to be added.

Additive Feed Material is a feed ingredient that is added to the ration with a small amount, because if it is given in high quantities, it can produce residues in the body of livestock. The form of additive feed ingredients commonly given to livestock consists of liquid simplified added to drinking water. The form of dry simplified (dry flour) at a dose of 0.5% body weight, has not given a real effect on increasing livestock productivity (Lee et al., 2005). Herbal medicinal products be affected by quality of raw material (BPOM, 2004) This is since it has not been processed or purified as an active substance and is not exactly the dose and the low affinity of the active substance contained in the additive.

Anti-nutrient substances in feed ingredients make up rations, causing disruption of the function of livestock organs, especially the liver. In order to find out whether liver damage is occurring, a series of checks of compounds in the body are usually carried out, such as SGOT (Serum Glutamic Oxaloacetic Transaminase), SGPT (Serum Glutamic Pyruvic Transaminase), AST (Aspartate Transaminase), and ALT (Aspartate Transaminase), or immunochemical examination. AST and SGPT or ALT and SGOT are intracellular enzymes that are normally in cells (Lee et al., 2005). These enzymes function as catalysts in chemical reactions that occur in cells. When liver damage occurs due to toxic compounds, contamination of microorganisms results in changes in permeability in the cell membrane. This condition results in the transfer of enzymes in cells into the blood, this event is called serum transaminase. To overcome this condition, hepatoprotection compounds are needed which can reduce the content of SGPT and SGOT enzymes in the blood.

The oxidation reaction is the cause of damage to the liver, it can be seen from several drugs referred to as *hepatoprotective* which is an antioxidant compound. One example is silymarin compounds contained in plants (*Sylybum marianum*). Feeding in extracts ethyl acetate 17,5 mg/kg of doses *body weight* has been applied for in vivo test using *mice.* Induced by $CCL_{4;}$ They demonstrated hepato-protective effects (Lee et al., 2005). Ethyl Acetate extracts were able to reduce levels of the enzyme *alanine aminotransferase* (ALT) and *aspartate aminotransferase* (AST) by 56% and 44%. Local plants in Indonesia which contain silymarin are "pegagan" plants (*Centella asiatica*), which is a weed that grows in rice fields and irrigation areas. Silymarin is a flavonolignan that contains silybin (the main compound), isosilibin, silidianin, and silicristine (Lee et al., 2005; Tedesco et al., 2004). According to Heyne (1987) and Iswari (2002), "pegagan" plant contains almost the same as *Sylibum marianum* plants.

Based on these assumptions, the process of making feed additives is carried out in the form of dried "pegagan" extract, which functions as a hepatoprotective in livestock. *Centella asiatica* flour extract is expected to be used as an herbal medicine that has characterization, and follows the guidelines required by BPOM (Departemen Kesehatan Republik Indonesia, 2013) including: shrinkage levels, total ash content, acid soluble ash content, water soluble extract content, and levels extract dissolves organic solvents. Products from characterization can be developed as additive feed ingredients for livestock.

MATERIALS AND METHODS

Research sites. The research has been carried out in the Poultry, Non-Ruminants Nutrition Laboratory and Livestock Food Industry, Faculty of Animal Husbandry, Padjadjaran University, Sumedang, West Java, Indonesia.

Tools. Analytical scales, dark bottles (maceration processes), rotary evaporators, vaporizers, ovens, desiccators, water baths, furnaces, blenders, and laboratory glassware.

Research Materials. Pegagan plant, lactose powder, ethanol 96%, 0.2 N sulfuric acid, glacial, chloroform, and hexane acetic acid.

Preparation of "Pegagan" Extract. Pegagan plant samples (*Cantella asiatica*), washed and dried air in laminar flow, in temperature 30^0C, for 10 days, until the water content is not more than 10%, then mixed using a blender.

Extract Making. As much as 100 grams of "pegagan" dry flour, put in a maceration bottle, added 1 liter of ethanol 96%, soaked for 6 hours while stirring, then let stand for 24 hours. Macerates are separated, and the process is repeated twice with the same type and amount of solvents. All macerates were collected and evaporated with vacuum vaporizers until thick extracts were obtained. The yields obtained were weighed and recorded (BPOM, 2004).

Making "Pegagan" Dry Extract. The thick extract produced from maceration products, dried by adding lactose, by comparison (2:1); (1:1); and (2:3), then homogenized. Then added 300 ml hexane solvent for every 100 grams of dried extract mixed with lactose, stirring several times for 2 hours, let it settle, do the same for the rest, and separate excess hexane. Repeating washing with hexane, the remainder is dried in an oven at 70^0C, after drying, milling, and weighing (into powder). Furthermore, characterization of dried extract flour was obtained (Martin et al., 1961).

Characterization of "Pegagan" Dry Extract

Loss of drying rate. Extract flour was weighed in a shallow weighing bottle of 2 grams, and flattened by shaking the weighing bottle, so that the extract flour resembled a layer of approximately 10 mm thick, then put into the drying chamber (laminar), dried at 105^0C. Every drying, the bottle is left in the exicator so that it cools to room temperature. Then it was dried again at a determination temperature to a fixed weight and stated the value of drying losses in % weight per weight (Departemen Kesehatan Republik Indonesia, 2013).

Total ash content. Weigh 3 grams of extract flour, put it into a porcelain saucer that has been spawned and tasted, evenly spread, slowly gently until the charcoal runs out, cool and weigh; calculate the ash content of the material that has been dried in the air; calculate in % (weight / weight).

Acid insoluble ash content. Ash obtained from the determination of total ash content, simmer with dilute 0.2 N sulfuric acid for 5 minutes, collect the insoluble part in the acid, filter it

with crucible glass or ash-free filter paper, wash it with hot water, until constant; calculate the acid insoluble ash content of material that has been dried in the air.

Levels of water-soluble compounds. 5.0 gram of extract was macerated for 24 hours with 100 ml of chloroform LP water using a clogged flask while being shaken many times, for the first 6 hours and left for 18 hours. Strain, apply 20 ml of the filtrate to dry in a shallow dish on a flat (Petri dish) layer, heat the residue in the oven at 105^0C until the weight is fixed; calculate the levels of water-soluble compounds against the initial weight of the extract; state in % weight per volume.

Levels of compounds dissolved in organic solvents. 5.0 gram of extract was macerated for 24 hours with 100 ml of 96% ethanol, in a clogged flask, while being shaken repeatedly for 6 hours and left for 18 hours. Strain quickly to avoid evaporation of ethanol, then apply 20 ml of filtrate to dry in a flat-based cup (Petri dish) that has been tasted, heat the residue in the oven at 105^0C to a fixed weight; calculate the levels of soluble compounds of organic solvents against the initial weights, expressing in % (weight / volume).

RESULTS AND DISCUSSIONS

Results of the Making of "Pegagan" Extract

The extract was made by maceration using ethanol 96% solvent, carried out with 2 repetitions. The results of the thick extract obtained can be seen in Table 1.

Table 1. Weight of "Pegagan" Extract

No	Powder Weight of Pegagan Simplicial (g)	Weight of Pegagan Extract (g)
1	100	70.8626
2	100	82.3571
3	100	64.1034

The experimental results showed that the weight of the thick extract obtained for each process was not the same. This may occur because of the uniqueness of "pegagan" simplicial, both the age of harvest, the proportion of leaves, stems, and roots of "pegagan", and resulting in the chemical content and weight of thick extract produced in the maceration process.

The Result of Making Pegagan Extract

The drying process of thick extract produced by maceration is done by adding a binder in the form of lactose flour and carried out with various comparisons. The comparison is as follows: half the weight of the heavy extract (2:1), equal to the weight of the extract (1:1), and one half of the weight of the thick extract (2:3). This is done to study the dynamics or character of the dried extracts, and lactose as a material used as a binder. The weight of dried extract flour is presented in Table 2.

Table 2. Dry Extract Flour Weight

No	Binder composition	Thick extract (g)	Dry extract flour (g)
1	2 : 1	70.8626	36.1150
2	1 : 1	82.3571	82.8579
3	2 : 3	64.1034	126.0557

In Table 2 the thick extract extraction process produces the highest dried extract flour obtained from the treatment of one half of the weight of extract (2:3), which is 126.0557 grams. The lowest is the proportion of binder (2:1), which is obtained by dry extract of 36.1150 grams. This illustrates that the dried extract of *Centella asiatica* which is dried carries out a reduction reaction to lactose by converting lactose flour into a volatile compound, or lactose is dissolved by a component of liquid which can be evaporated. It is water contained or volatile substances and alcohols that are used as solvents and are not able to be bound by a cylindrical substance.

Results of Characterization of Pegagan Extract Flour

The characterization of "pegagan" dried extract aims to get the best character from dried starch extract of "pegagan". Can the "pegagan" dry extract flour be classified as additive feed ingredients or not. Characterization of drying shrinkage aims shown the amount or large number of compounds lost in the drying process, in special cases identical to the water content, and determine the handling of the product produced. The results obtained, whether the product still needs preservatives or not, to avoid contamination of microorganisms. The characterization of total ash content aims to describe the internal and external mineral

content from the initial process to forming dried extract flour, and the determination of acid insoluble ash content aims to see the presence of metal content in the form of silicate salt. Examination of levels of water-soluble compounds and examination of the content of soluble organic solvent compounds aims to see the content of minerals and compounds that are efficacious as drugs (Departemen Kesehatan Republik Indonesia, 2013). The results of the characterization of "pegagan" dry extract are presented in Table 3.

Table 3. Results of Characterization of "Pegagan" Dry Powder Flour Test

No	Test Parameters	Binder composition		
		2 : 1	1 : 1	2 : 3
1	Drying shrinkage (% b/b)	1.5150	0.5730	0.5724
2	Total ash content (%)	1.1730	0.3930	0.0057
3	The level of acid dissolves ash (%)	0.9460	0.0360	0.0094
4	Water soluble compound level (%)	83.3215	86.0860	82.5756
5	Levels of soluble organic solvents (%)	13.0072	6.6690	5.9682

Table 3 illustrates that the best treatment is the addition of lactose or composition binder in a ratio of 2: 1. The characterization results obtained were: drying shrinkage value of 1.16%, total ash content of 1.17%, acid soluble ash content of 0.9%, water soluble compound content of 83.32%, and organic solvent soluble compounds of 13, 01%.

CONCLUSIONS

The results of this study concluded that the comparison of lactose (as a drying binder) with "pegagan" extract was half a part of lactose with one part of thick extract of "pegagan". The characterization test results obtained that the dried extract of "pegagan" (*Cantella asiatica*) has the properties and potential as feed additives which are rich in active ingredients in the form of water-soluble compounds and organic solvents.

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