

Identification of A-3ctive Component in Plant of Rampelas (Ficusampelas) as a Natural Coagulant in the Making of Traditional Soft Cheese

I Made Sugitha¹ Ni Nyoman Pusrawati¹ IW Rai Widarta¹ I Nyoman Sumerta Miwada²

1. Departement of Food Science and Technology, Faculty of Agricultural Technology

2. Departement of Faculty of Animal Husbandry, Udayana University Jimbaran, Bali Indonesia

Abstract

The purpose of this study is to obtain alternative materials that can be used as a substitute for *rennet* which until now still has a high price and must be imported in the process of making soft cheese. Specific objectives to be achieved in this research are: to know the components of active compound found in the stem bark of the rampelas plants (*Ficusampelas*) (SBR) which can act as coagulant in soft cheese making process, to know what main component has the biggest role as Coagulant in soft cheese making process, to know the proper concentration of bark of rampelas (*Ficusampelas*) stem bark in the process of making soft cheese so that soft cheeses can be produced with the best characteristics. The results of the study concluded that SBR can be used as coagulant on the making of traditional soft cheeses of rampelas with a minimum concentration of 0.25%. The characteristics soft cheeses resulting product have water content 66-70%; protein: 16-21%, and the texture is rather soft. In addition, of tannin and phenolic compounds, indicate that the tradisional rampelas cheese (TRSC) can be developed into a functional Soft cheese against certain diseases.

Keywords: rennet, natural coagulant, stem bark of the rampelas, traditional soft cheese

1. Introduction

One of the livestock commodity products that is a source of animal protein is quite a lot of demand is milk. However, naturally fresh milk has an easily damaged, so it takes processing process that aims to extend the shelf life and minimize damage to milk. One form of milk processing is by making cheese. Cheese is a food made with the basic ingredients of milk produced by separating solids matters of milk through a coagulation process. The process of coagulation is done through the fermentation stage of lactic acid bacteria or by using the enzyme or *rennet* to produce curd and whey.

Currently, Indonesia is still importing rennet extract from countries in Continental Europe, therefore it is necessary to find out the alternative use of rennet substitution in cheese making to reduce cheese production cost. The alternative for rennet substitution is the use of SBR which can contribute greatly to the development of cheese processed products. SBR can be used as a coagulating agent of milk protein in the cheese making process. Rampelas plant (*Ficusampelas*) was a plants of the Moraceae family, which grow up to 20 meters in height and 50 cm in stem diameter, growing throughout Indonesia, scattered at an altitude of less than 1,300 m above sea level. This plant has a different name in each region as in Sundanese and Malay this plant is known by the name of Hampelas whereas in Javanese language known as Rampelas. The stem of the tallow tree stands straight, round, and has a simpodial ramification. The leaves are single, elongated, oblong, jagged edges. The leaves are light texture rough and if dried can be used as sandpaper for smoothing the wood surface. The flowers have a length of 5-7 cm, are brownish-green, and the eyelid-shaped petals. While the seeds are round and white. Rampelas there are cultivated because of the usefulness of the leaves, some are grown by itself.

This study aims to determine the components of the active compounds content in the SBR and the effectiveness used as coagulation on the quality of soft cheeses produced. The information of usefulness of SBR as public expectation at a certain concentration can be used in the manufacture of soft cheese (TRSC) with the best characteristics.

2. Research-Methods

At this stage, the identification of the active compound content in the SBR which includes phenol compounds, flavonoids, saponins, minerals and other active compounds. The result of identification of active component from bark of rampelas plants (*Ficusampelas*), will then be evaluate to find out what component plays the biggest role in milk coagulation process. In the next stage, the effectiveness level of SBR used in cheese manufacture, it was treated with various concentrations and dryness The characteristics and quality evaluation of soft cheese (TRSC) which include: water, ash, protein, fat, salt content, pH and sensory evaluation of color, flavor, aroma, body and texture, as well as overall acceptance.



Figure 1. Stem Bark Rampelas (*Babakan Rampelas*)

3. Results-And-Discussion

The active component of SBR which include: tannins, phenolic compounds, saponins, and flavonoid compounds.

3.1 Tannin compounds

Tannin is a water-soluble compound, glycerol, alcohol and hydro alcohol, but insoluble in petroleum ether, benzene and ether decomposes at 210 ° C, flash point 210 ° C, and burns at 526 ° C (Jayalaksmi and Mathew (1982), Sax and Lewis, (1989)).

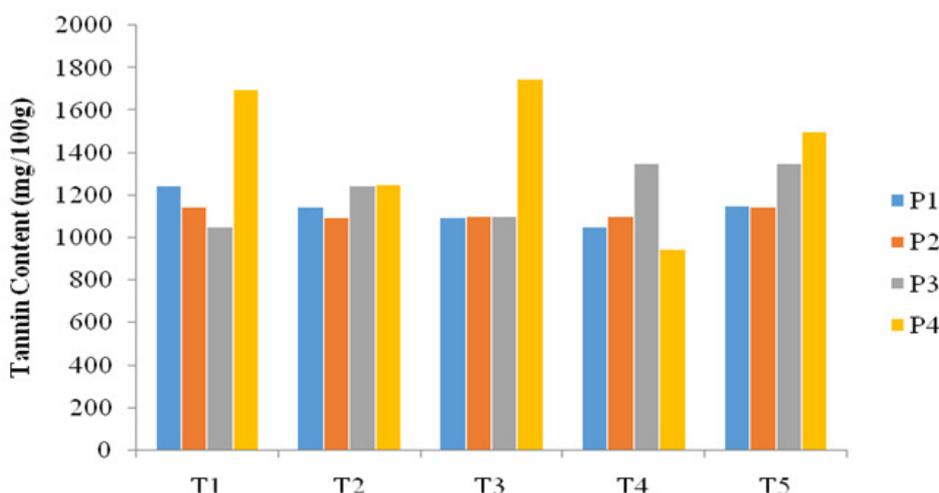


Figure 2. Tanin content mg / 100g powder rubbed)

3.2. Phenolic compounds

Phenols are structures formed from substituted benzene with -OH groups. The contained -OH group is a strong activator in the electrophilic aromatic substitution reaction (Fessenden, 1982).

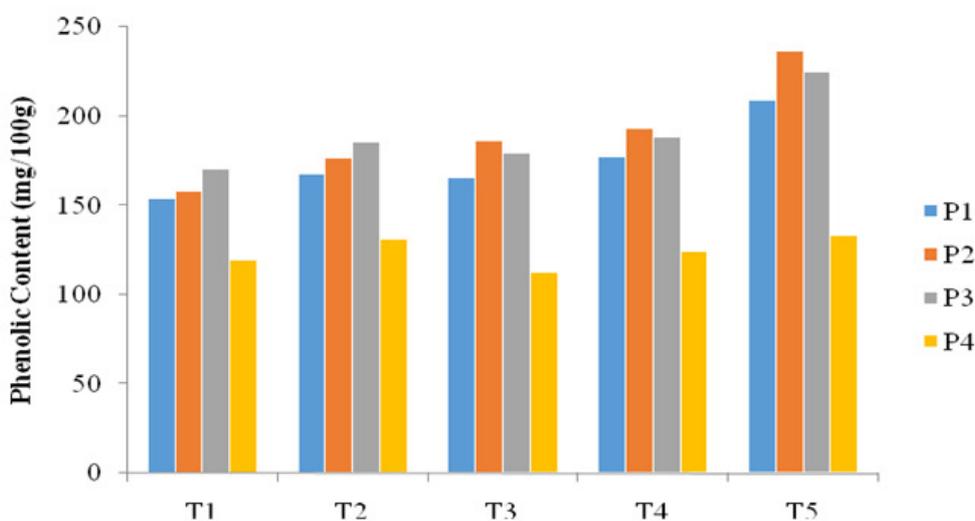


Figure 3. Phenol Content (mg / 100g Rampelas Powder)

3.3. Soft Cheese Making

3.3.1. Stem Bark Rampelas (SBR)

Dry SBR was selected as coagulant in making soft cheese using UHT cow milk with level of 0.50%; 0.40%; 0.33%; 0.29% and 0, 25% or in the ratio of dry *SBR* : cow milk (b / v) respectively: 1: 200; 1: 250; 1: 300; 1: 350; And 1: 400; As a repeated treatment 3 times and analyzed using a randomized block design



Figure 4. Traditional Rampelas Soft Cheese (TRSC)

3.3.2 Water content

Water is a nutritional component of cheese that will affect the appearance (characteristics of cheese), shelf life and nutrient. The TRSC water content generated from the 3 types of churns of grass (wet, semi-wet, dry) can be seen in Table 8, so that the development is used for dry-stirrings that its use is more effective than others.

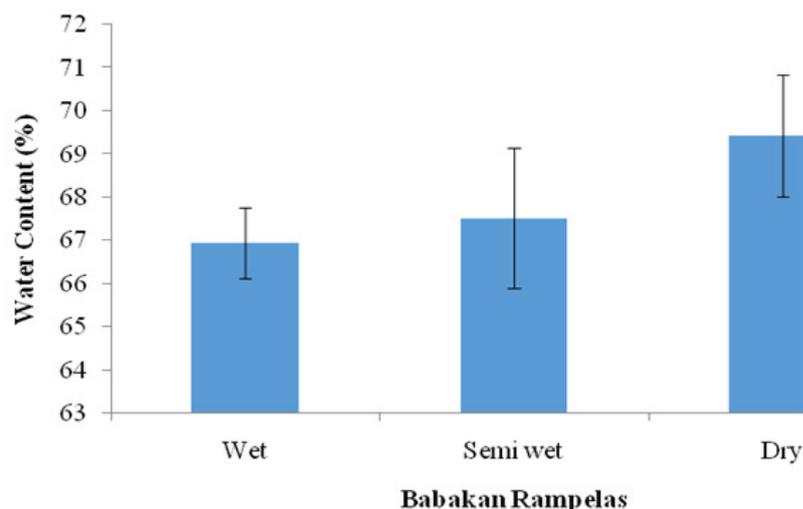


Figure 5. Water Content (%) Traditional Cheese Using SBR as Coagulant

3.3.3. Protein levels

As one of the factors in the production of protein, the protein will agglomerate when the isoelectric pH of milk is reached (pH 4.7), and is related to the protein content of the cheese. The TRSC protein in this study ranged from 16 - 21% which can be seen in Table 4.

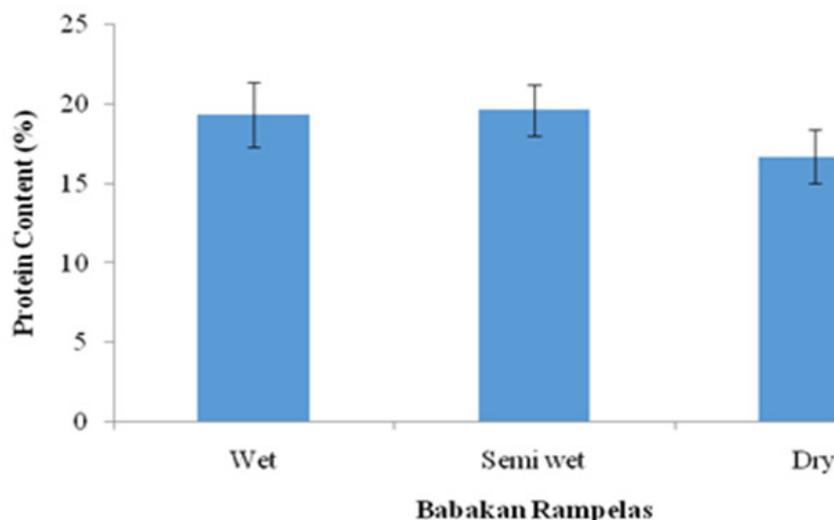


Figure. 6. Protein Content (%) Traditional Soft Traditional Cheese Using SBR Coagulant

4. Conclusion

From the results of the study it was concluded that SBR can be used as coagulant on the making of traditional soft cheeses with a minimum concentration of 0.25%. The characteristics of resulting soft cheeses such as : water content 66-70%; protein: 16-21%, the texture is rather soft. In addition, with the identification of tannin and phenolic compounds, indicating that the cheese (TRSC) can be developed into a functional cheese against certain diseases.

Therefore, the suggestion for further research, the study of the functional properties of tannin and phenolic compounds for diseases associated with certain types of cheese will be more effectively for increasing milk consumption of the Indonesian people.

5. Bibliography

- AOAC. 1994. Official Method of Analysis. 16th Edition. Association of Official Analytical Chemistry International, Gaithersburg.
- Buckle, K.A, Edwards R.A, Fleet, G.H, Wotton, M. 1987. Food Science. Hari Purnomo's translator, Adiono. Publisher University of Indonesia.
- Sax, I. And Lewis, R.J., 1989, Condensed Chemical Dictionary, 11th ed., Pp. 36, Van Nostrad Reinhold Company
- United States Departement of Agriculture. 2001. USDA Spesification for Cottage Cheese and Dry Curd Cottage Cheese. <http://www.ams.usda.gov/>

Thank-You Note

This paper is part of a study entitled: Identification of Active Compound Components in Plumed Plant Bark (*Ficus Ampelas*) As Natural Coagulant In Traditional Soft Cheese (Soft Cheese) is financed through PNBPN 2013, Udayana University Health and Medicine Research Group. Thanks for the help, we hope this paper useful.