

# PROCEEDINGS

INTERNATIONAL SEMINAR FOR RESEARCH MONTH



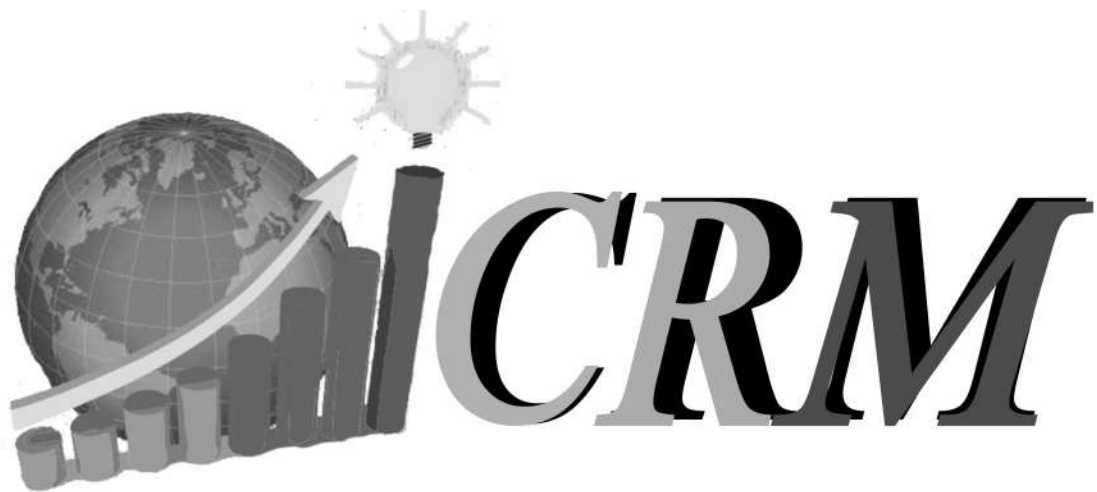
**“Innovation, Development and Utilition  
of Research and Community Service”**

**Surabaya-Indonesia, November 15<sup>th</sup>, 2016**

**UPN VETERAN JAWA TIMUR**

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# **PROCEEDING**

## **INTERNASTIONAL SEMINAR RESEARCH MONTH**

**Theme : Innovation, Development and Utilition of Research and Community Service**

### **Keynote Speaker :**

1. **Inocencio E. Buot Jr.** (Prof.Ecology and Biodiversity, Faculty of Management and Development Studies University of The Philippines, Los Banos): Biodiversity Research and Community Experiences, Conclusion and Recommendations
2. **Dr. Primo Garcia** (UPOU, Philippines: Research, Instruction and Publics Service in an Open Learning System: The Innovation Nexus at Up Open University).
3. **Dr. Ing. Wofngang Busse** (Coordinator of Hochschule Wismar for The Indonesian – German Students Research & Development Teams)
4. **Zulaicha Paratuty, ST. M.Sc.** (Coordinator of Hochschule Wismar for The Indonesian – German Students Research & Development Teams)

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## **PREFACE**

All praise and thanks to the presence of Allah Almighty who has given His grace and guidance on unresolved Proceedings of the International Seminar Research Month 2016 with the theme "Innovation, Development and Utilization Research and Community Services" held on November 15, 2016 at Surabaya, Indonesia.

The Proceedings contains conclusion of International Conference for Research Month 2016 is a conference organized by the University of Pembangunan Nasional "Veteran" Jawa Timur. This year's theme covered broader topics across innovation, development and utilization of research and community services

We would like to thank all keynote speakers, moderators, presenters, and participants for their cooperation and valuable suggestions that contribute to the success of this year's conference. We would also like to give our gratitude to all members of organizing committees of all event during this conference, who have given the article that supports the conclusion of these proceedings.

Finally, we sincerely hope that this coference would contribute to the development to wards a better Indonesia, especially in science, economy and social aspects.

Thank you,  
Surabaya-Indonesia, November 15<sup>th</sup>, 2016

**Editorial Board**  
**ICRM 2016**



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## ANALYSIS PHYSICAL CHEMISTRY FORMULATION "ES PUTER" FROM THE FRUIT OF MANGROVE (*Sonneratia caseolaris*)

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### ABSTRACT

Es puter is one frozen food product and is often identified with the ice cream. Fat sources used in es puter derived from coconut milk. Utilization of fruit mangrove applied into es puter aims to increase the economic value and diversified fruits mangrove. In addition, fruits contain antioxidants that mangrove high enough so that enough potential to be developed as es puter functional. The purpose of this research is to know the influence of formulation of coconut milk and pasta fruit mangrove against physico chemical es puter fruit mangrove. This study used a Randomized Complete Design method (RAL) with 1 factors, namely the formulation of coconut milk : fruit pasta mangrove (62:10), (56:14), (18:54), (50:22), (46:26), (42:30), (39:34) and repeated as much as 3 times. Data were analyzed with ANOVA, Tukey Test using advanced test ( $\alpha = 5\%$ ). to know or no influence of physico-chemical treatment on es puter fruit mangrove. Es puter fruit mangrove 42% coconut milk formulations: 30% fruit paste mangrove is the best treatment with the value of the overrun 8,89%, melting speed 5.59 minute, viscosity 1.55 dPa'S, fat content 3.54% , antioxidant activity 30.2%, and total phenol 18.88 ppm.

**Keywords:** Es puter, fruit mangrove

### INTRODUCTION

Es puter is one of my favorite desserts in Indonesia. Es puter is similar to ice cream, but the material is fundamentally different. The basic ingredients of ice puter is coconut milk as a substitute for milk. According to Tansakul and Chaisawang (2006), the coconut milk is oil in water emulsion which is white, which is obtained by way of squeezing fresh coconut meat that has been shredded or destroyed with or without the addition of water. The highest content of coconut milk is water and its chemical composition is almost resembles cow's milk.

During this puter ice made with coconut milk and raw material addition of vanilla which only need to be developed just so refreshing es puter functional by adding the component bioaktif on es puter. The purpose of the addition of the bioaktif component is other than purely refreshing ice puter can also provide health effects against the consumer. The bioaktif component can be taken from an assortment of fruit that have a good nutritional one fruit mangrove.

Fruit mangrove contain good nutrition. According to Manalu dkk. (2013), the composition of fruit per 100 g fresh mangrove contains 85% water content, rate of 8.4% ash, 9.2% protein, 4.8% of fat, 77.6% carbohydrates, vitamins A 11.21 (RE). Vitamin B1 5.04, Vitamin B2 7.65 mg, Vitamin C 56.74 mg, while according to Varghese, et al. (2010) fruit mangrove (*Sonneratia caseolaris*) has steroid component, triterpenoid, and flavonoids. The component has the function as analgesic, anti-inflammatory, antioxidant,

hypoallergenic, and anti-microbial (Shadu, et al, 2006).

According to research Santoso et al. (2010), fruit mangrove (*Sonneratia caseolaris*) has a content of total phenols 29.18 mg TAE/100 g of methanol extracts of rough. The methanol extract of rough also produce antioxidant activity 530.21 ppm from the fruit of the mangrove. Antioxidant compounds that can inhibit oxidation reactions, with the bind free radicals. As a result of cell damage can be inhibited (Winarsi, 2007). Therefore, the potential for enough mangrove fruit developed as es puter fruit mangrove.

Previous research results es puter according to Wardani (2014). the best formulation es puter obtained with 4% composition of green tea and 30% of black glutinous rice, while according to Hestiana (2009), the best formula es puter retrieved from the formulation of 50% coconut milk and 35% sweet potato paste.

### PURPOSE

Knowing the influence the formulation of coconut milk and pasta fruit mangrove against physico-chemical on es puter fruit mangrove, as well as determining the best treatment combinations on the formulation of coconut milk and pasta fruit mangrove to quality iced fruits puter mangrove.

### RESEARCH METHODS

#### 1. Time and place of Research

Research done in the Labotarium Food processing technologies, Food Analysis and Sensory Test food technology studies Program

University of Pembangunan Nasional "Veteran" East Java Surabaya from February until September 2016.

## 2. Tools and materials

Tools used for analysis include: cabinet dryer, evaporator, measure out 100 ml flask, flask measure out 10 ml, erlenmeyer 250 ml, beaker glass 1000 ml, beaker glass 500 ml, beaker glass 100 ml, stopwatch, funnels, volumetric pipette, pipette drops, mixer, filter paper, analytical scales, measuring cup 100 ml, spektrofotometer, viskometer.

Ingredients used in this study fruit obtained from mangrove (mangrove forests Wonorejo – Surabaya), coconut, sugar, and salt obtained from (market Progo – Sidoarjo), obtained from CMC (store cakes Wiguna – Surabaya), GMS are obtained from Food processing technology laboratory, Faculty of industrial technology UPN "Veteran" of East Java.

Chemicals used for analysis is aquades, ethanol 96%, methanol (CH<sub>3</sub>OH), DPPH (in methanol) 0.1 mm *Folin-Ciocalteu* reagent, sodium carbonate, tanat acid.

## 3. Method

This study used a Randomized Complete Design (RAL) with one factor and repeated as much as 3 times. Data were analyzed with ANOVA, Tukey Test using advanced test ( $\alpha = 5\%$ ).

1. The variable response that includes physical properties (melting speed, overrun, viscosity), chemical properties (fat content, antioxidant activity, total phenol).
2. free Variable change, namely the formulation of coconut milk : fruit paste mangrove (62:10), (56:14), (18:54), (50:22), (46:26), (42:30), (39:34)
3. The variables are bound, that the concentration of CMC, GMS, sugar, salt.

## RESULTS AND DISCUSSION

### 1. Raw materials

Based on the results of the analysis of the spectrum shows that the treatment of the stripping fruit mangrove influential real ( $P \leq 0.05$ ) against the activity of antioxidant fruit extracts mangrove. The average value of antioxidant activity can be seen in Figure 3.

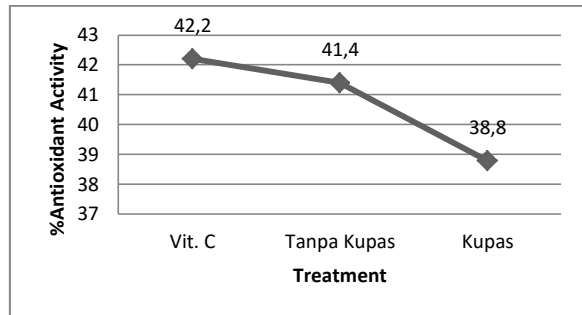


Figure 3. the relationship between treatment of the stripping fruit extracts antioxidant activity against mangrove.

In Figure 3 shows that the treatment of the stripping fruit mangrove can lower antioxidant activity in fruit extracts mangrove. This is due to the skin of the fruit contains a compound bioaktif mangrove. In accordance with the statement of Bandarayanake (2002) which States, the skin contains tannin mangrove fruit that serves as an antioxidant because of its ability to stabilize lipida faction and activeness in the inhibition of Lipoxygenase. Tannin is one compound phenol complex. Part of the flesh of the fruit contain saponins and mangrove steroids that have activity as an analgesic and anti inflammatory.

Based on the results of the study, the activity of antioxidant fruit extracts mangrove has a percent lower antioxidant activity than vitamin C. This indicates that the activity of antioxidants on vitamin C is much higher compared to fruit extracts mangrove. Nevertheless, judging from the activity of the antioxidants fruit extracts mangrove potentially as an alternative ingredient natural antioxidants.

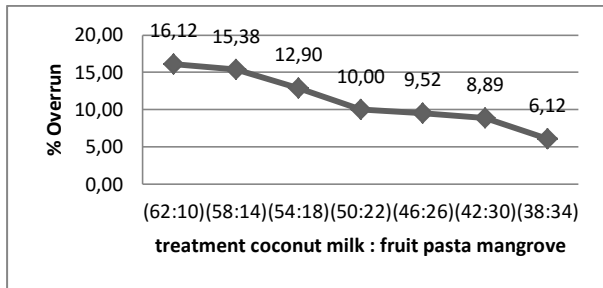
## 2. Product Es Puter Fruit Mangrove

### a. physical properties

#### 1. Overrun

Based on the results of the analysis of the variety show that coconut milk treatment: fruit paste mangrove influential real ( $P \leq 0.05$ ) against overrun es puter fruit mangrove. The average value of overrun can be seen in Figure 4.

Overrun is the development of volume on the making of ice cream. Overrun is calculated based on the difference in the volume of ice cream and ice cream batter volume (Susilorini, 2006).

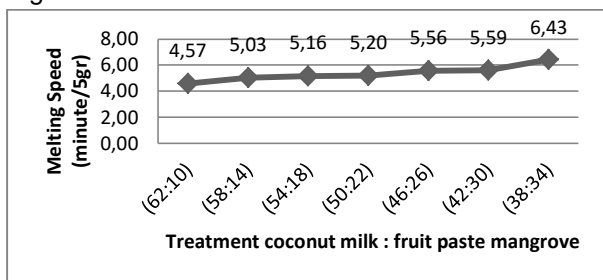


**Figure 4.** The relationship between the treatment of the coconut milk : fruit paste mangrove against overrun es puter fruit mangrove.

In **Figure 4** shows that the more the formulation of coconut milk is added to the higher overrun. Muse and Hartel (2004) States, the high fat content was able to form a three-dimensional structure that causes water and air are caught being larger. This three-dimensional structure occurs during the process of shuffling dough es puter, which during the mixing process of fat will break apart and form a three-dimensional structured globular. Globular structure have room to ease terperangkapnya air in the dough, so the dough will expand.

## 2. Melting Speed

Based on the results of the analysis of the variety show that coconut milk treatment: fruit paste mangrove influential real ( $P \leq 0.05$ ) against the speed of melting ice fruit puter mangrove. The average value of the speed of melt can be seen in **Figure 5**.



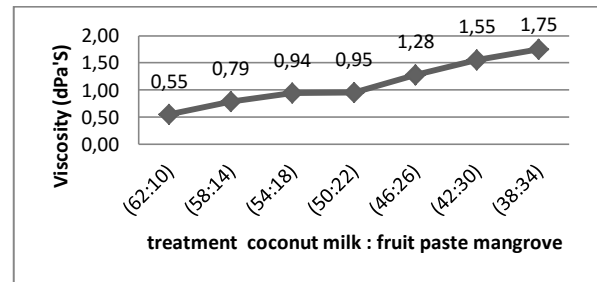
**Figure 5.** The relationship between the treatment of the coconut milk: pasta fruit mangrove melting speed against es puter fruit mangrove.

In the figure 5 shows that more and more coconut milk formulations that added the faster melting es fruit puter mangrove. Herlambang dkk. (2011) stated, fat affect the speed of melting ice cream. The higher the amount of fat, resistance to melting ice cream is getting low. The speed of melting ice cream is also related to the overrun the low high. The higher the overrun so the faster the ice cream melts, as otherwise the lower overrun the more slowly the ice cream melts (Waladi, 2015). This is in accordance with the opinion of the Muse and Hartel (2004), stating that ice cream

melting time is affected by the amount of air trapped in ice cream mix ingredients, ice crystals that are formed, as well as the fat content in it.

## 3. Viscosity

Based on the results of the analysis of the variety show that coconut milk treatment: fruit paste mangrove influential real ( $P \leq 0.05$ ) against the ice viscosities puter fruit mangrove. The average value of viscosity can be seen in **Figure 6**.



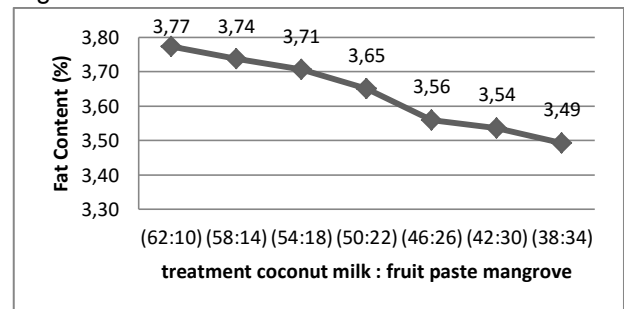
**Figure 6.** The relationship between the treatment of the coconut milk : fruit paste mangrove against viscosity es puter fruit mangrove.

In **Figure 6** shows that the more fruit paste formulation mangrove then the higher viscosity es puter fruit mangrove. Guven and karaca (2002) stated, the viscosity can be declined because of the materials affected by mixed in a dough more liquid is added then it can lose viscosity, conversely the more dense substance that is added then the viscosity will be increasing. The increase in viscosity can be caused by particles in the ice cream batter like fiber, water, and protein components bonded with materials stabilizer (Oksilia, 2012). Good viscosity it ranges between 50-300 cP (Marshall, 2000).

## b. chemical properties

### 1. the fat content

Based on the results of the analysis of the variety show that coconut milk treatment: fruit pasta mangrove has no effect on real ( $P \geq 0.05$ ) against fat levels es puter fruit mangrove. The value of the average fat content can be seen in **Figure 7**.



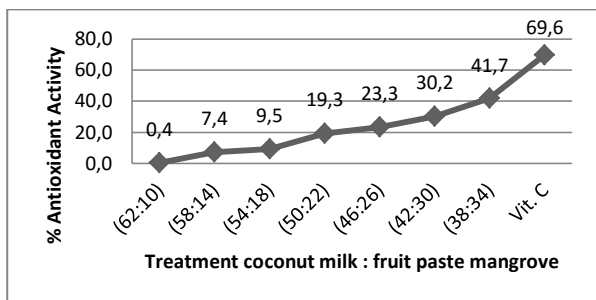
**Figure 7.** The relationship between the treatment of the coconut milk : fruit paste mangrove against fat levels es puter fruit mangrove.

In Figure 7 shows that more and more coconut milk formulations then the higher fat levels es puter fruit mangrove. Fat in the es puter fruit mangrove much gained from the addition of coconut milk. This coconut milk contains 35% fat content (Tansakul and Chaisawang, 2006), while the more additions of fruit paste Kike and reduced the addition of coconut milk can lower the fat content on es puter. According to Manalu, dkk (2013), in 100 gr fruit contain mangrove 4.82% fat content.

According to SNI No. 01-3713-1995, the fat content of ice cream should have a minimum of 5.0%, while the fat content es puter in the study ranged from 3.49%-3.47%. So far there is still no standard which describes es puter. ES puter with a low fat content has advantages among other fit person being consumed to a diet low in fat.

## 2. Antioxidant activity

Based on the results of the analysis of the variety show that coconut milk treatment: fruit paste mangrove influential real ( $P \leq 0.05$ ) antioxidant activity against es puter fruit mangrove. The average value of antioxidant activity can be seen in Figure 8.



**Figure 8.** The relationship between the treatment of the coconut milk: pasta fruit antioxidant activity against es puter fruit mangrove.

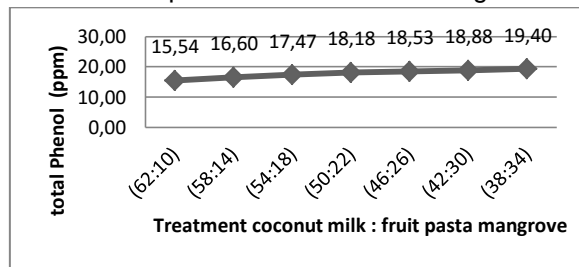
In Figure 8 shows that the more the addition of fruit paste mangrove on es puter the higher activity of the antioxidant. According to et al, Varghese. (2010), fruit (*Sonneratia caseolaris*) mangrove has 24 components including eight of nine steroids, triterpenoid, three and four flavonoid derivatives of benzene carboxylic. The component has the function as analgesic, anti-inflammatory, antioxidant, hypoallergenic, anti-fungal and antimicrobial.

Based on research results, antioxidant activity es puter fruit mangrove has a percent lower antioxidant activity than vitamin c. This indicates that the activity of antioxidants on vitamin C is much higher compared to the es puter fruit mangrove. Nevertheless, judging from the activity

of the antioksidannya es puter fruit mangrove potentially as es puter which has functional properties.

## 3. Total Phenol

Based on the results of the analysis of the variety show that coconut milk treatment: fruit paste mangrove influential real ( $P \leq 0.05$ ) against total phenol es puter fruit mangrove. The average value of total phenols can be seen in Figure 9.



**Figure 9.** The relationship between the treatment of the coconut milk : fruit paste mangrove against total phenol es puter fruit mangrove

In Figure 9 shows the lower the formulation of coconut milk and the higher fruit paste formulation mangrove then the higher total phenols es puter fruit mangrove. This is because the fruit mangrove (*Sonneratia caseolaris*) has 24 components including eight of nine steroids, triterpenoid, three and four flavonoid derivatives of benzene carboxylic. The component has the function as analgesic, anti-inflammatory, antioxidant, hypoallergenic, anti-fungal and antimicrobial (Varghese et al., 2010).

Average total phenol on es puter fruit mangrove between 15.54 ppm until 19.40 ppm, those results showed a low content of total phenols at es puter fruit mangrove. Santoso dkk, (2010) States, ekstrak fruit metnol solvent with mangrove has a content of total phenols 29.18 (mg TAE/g sample) and has a very weak antioxidant activity successfully inhibit free radical DPPH at concentrations of 530.21 ppm. In accordance with the opinion of the Molyneux (2004), the more the content of phenol then the greater activity of antioxidant, for the compound composed of phenol that have free radical catcher activity as well as vice versa.

## CONCLUSION

Based on the results of the study on making es puter fruit mangrove with coconut milk formulations: mangrove fruit paste, can be taken the following conclusions:

1. From the results of the statistical analysis of es puter fruit mangrove, can note that there is a real interaction on coconut milk formulations:

mangrove fruit paste against the parameters of the overrun, melting speed, viscosity, total antioxidant activity, and phenol.

2. Es puter fruit mangrove 42% coconut milk formulations: 30% fruit paste mangrove is the best treatment with the value of the overrun 8,89%, melting speed 5.59 minute, viscosity 1.55 dPa'S, 3.54% fat content, antioxidant activity 30.2%, and total phenol 18.88 ppm.

#### ADVICE

Es puter to get product good and mangrove fruit acceptable to consumers, preferably on ice making puter fruit paste mangrove additions is not more than 30%.

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