AESAP 2019
Agricultural Engineering for Sustainable Agriculture Production

The 3rd International Conference

on Agricultural Engineering for Sustainable Agriculture Production

IPB International Convention Center , Bogor, 14-15 October 2019

Contribution of Bio-system Engineering for Sustainable Agriculture toward Industrial Revolution 4.0

in Conjuction with the Annual Meeting of
ASEAN University Consortium for Food and Agri-based Engineering (AUCFA) and
ASEAN Cooperation for Agriculture and Bio-system Engineering (ACABE)

PROGRAM BOOK

Organized by :

Department of Mechanical and Biosystem Engineering, Faculty of Agricultural Engineering and Technology
Indonesian Society of Agricultural Engineers [ISAE], Bogor Chapter

Ministry of Agriculture - Republic of Indonesia
Indonesian Agency for Agricultural Research and Development
Indonesian Industrial and Beverage Crops Research Institute

IPB University — Bogor Indonesia —
PERTETA BOGOR CHAPTER
Ministry of Agriculture Republic of Indonesia

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The 3rd International Conference of AESAP 2019

Contribution of Bio-system Engineering for Sustainable Agriculture toward Industrial Revolution 4.0

IICC Bogor, 14 - 15 October 2019

Department of Mechanical and Biosystem Engineering
Faculty of Agricultural Engineering and Technology
IPB University, Indonesia

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Foreword

In the famous rain city of Bogor, AESAP Conference would hopefully bring a spirit of agriculture revitalization from the long calm movement. It is the time to wake up with a higher energy and innovative ideas as the demand for agricultural products and services are exponentially increasing, while the number of workers interested in agriculture decreases from year to year.

This conference discusses several issues of actual conditions and potential opportunities for the support of agricultural engineering on the development of agriculture. The conference will thematicallyt discuss the contribution of bio-system engineering for sustainable agriculture in the industrial revolution 4.0 era, covering topics of agricultural engineering field, such as:

- Postharvest and Food Engineering
- Energy and Agricultural Machinery
- Land and Water Resources Engineering
- Agricultural Structure and Environment Engineering
- System and Management

After the plenary sessions discussing on policies and general issues, the technical papers are discussed in five parallel sessions. Apart from the main agenda of the conference, there is a competition on student innovations related to the theme of the conference. There are 5 finalists are invited to Bogor to present their innovations in the final selection.

The Annual Meeting of Asean University Consortium for Food and Agri-based Engineering (AUCFA) and Asean Cooperation for Agriculture and Bio-system Engineering (ACABE) are also conducted in conjuction of the Conference.

During the Gala Dinner, several cultural performances would nourish the conference atmosphere with the rich Sundanese local culture.

Bogor, October 14th, 2019

The Committe

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Organizer

The symposium is organized by the Indonesian Society of Agricultural Engineers (ISAE) Bogor Chapter or Perhimpunan Teknik Pertanian Indonesia (PERTETA) Bogor, Department of Mechanical and Biosystem Engineering, IPB University, Ministry of Agriculture - Republic of Indonesia, Indonesian Agency for Agricultural Research and Development, Indonesian Industrial and Beverage Crops Research Institute.

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The 3rd International Conference on Agricultural Engineering for Sustainable Agriculture Production (AESAP 2019)
IICC Bogor, 14-15 October 2019

Contribution of Bio-system Engineering for Sustainable Agriculture toward Industrial Revolution 4.0

Program Schedule

First Day	**Monday, 14 October 2019**
08.00 - 09.00	Registration and Morning Coffee
09.00 - 10.00	Opening Ceremony and Plenary Session (Venue: Ballroom, IICC)
09.00 - 09.05	Greeting and Opening: MC
09.05 - 09.10	Report from the Chairperson of Organizing Committee *Dr. Edy Hartulistiyoso*
09.10 - 09.25	Opening Speech : IPB Concept on Agro-maritime 4.0 *Dr. Arif Satria*, Rector of IPB University
09.25 - 09.40	Indonesian Society of Agricultural Engineers (ISAE) / PERTETA Awards
09.40 - 10.00	Keynote Speech: Indonesian Government Policy for Promoting Sustainable Agriculture in Industrial Revolution 4.0 Era

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	Dr. Ir. Andi Amran Sulaiman, MP. Minister of Agriculture, Republic of Indonesia
10.00 - 12.00	Plenary Session I Moderator: *Dr. Desrial* (Chairman of Indonesia Association of Agricultural Engineers (ISAE/PERTETA))
10.00 - 10.30	Bio-system Engineering Development in ASEAN Countries *Engr. Ariodear C. Rico* - Chairman of AUCFA/ACABE
10.30 - 11.00	YANMAR Smart Sugarcane Harvest-Work and Yield Monitoring System *Mr. Muraoka Hiroaki* and *Mr. Yoshimine Takumi*
11.00 - 11.30	Smart Agriculture : Precision Agriculture + AI and IOT *Prof. Dr. Naoshi Kondo* – Kyoto University, President of JSAM
11.30 - 12.00	Discussion

10.00 – 12.00	Presentation – Student Design Competition Finalists (Room A)				
12.00 – 13.00	Lunch Break				
13.00 – 14.45	Parallel Session I (Venue: Meeting Room, IICC)				
	Ballroom	Room A	Room B	Room C	Room D
13.00 – 15.00	AUCFA Meeting (Room F)				
15.00 –	Coffee Break				

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15.30			
15.30 – 17.30	Parallel Session II (Venue: M		
	Ballroom	Room A	Room B
15.30 – 17.30	ACABE Meeting (		
18.30 – 21.00	Gala Dinner and Cul		

Second Day	**Tuesday, 15 Octo**
08.30 – 09.00	Registration and Mor
09.00 – 12.00	Plenary Sessio Moderator: *Dr. I Way* (Head of CREATA, member of N
	Current Status and Application T

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10.00 – 10.30	Development of Estates Crops in The Industrial Revolution 4.0 Era *Ir. Syafaruddin, PhD* Head of Indonesian Center for Estate Crops Research and Development (ICECRD)				
10.30 – 11.00	Discussion				
11.00 – 12.00	Presentation and Awarding of Student Design Competition				
12.00 – 13.00	Lunch Break				
13.00 – 14.40	Parallel Session II (Venue: Meeting Room, IICC)				
	Ballroom	Room A	Room B	Room C	Room D
14.40 – 15.00	Coffee Break				
15.00 – 17.30	Ballroom	Room A	Room B	Room C	Room D
17:30 – 18:00	CLOSING (Ball Room)				

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Parallel : Session 1
Venue : Room C
Date : 14 October 2019

Time	Agenda	
13.00 - 13.20	C1.1	Physical Properties of Liquid Smoke From Cocoa Skin With Differences of Water Levels and Pirolysis Temperature *I Ketut Budaraga and Dian Pramana*
13.20 - 13.40	C1.2	Design and performance test of drum kiln for durian peel carbonization *Sri Endah Agustina and Muhammad Firmansyah*
13.40 - 14.00	C1.3	Algorithmic Computation of Boiler Blowdown Heat Recovery System *Pratik Marathe and Pruthwiraj Kothavale*
14.00 - 14.20	C1.4	A Preliminary Study of Common Defects of Photovoltaic Modules in West Timor, Indonesia *Julius Tanesab, Adrianus Amheka, Rusman Sinaga and James Mauta*
14.20 - 14.40	C1.5	Simulation on Vapor Compression Heat Pump System for Rough Rice Drying *Leopold Nelwan, Radite Setiawan, Muhammad Yulianto, Gunawan Irfandi, Fachry Tanjung and Damawidjaya Biksono*
14.40 - 15.00	Coffee Break	

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Physical Properties of Liquid Smoke from Cocoa Skin with Differences of Water Levels and Pirolysis Temperature

I Ketut Budaraga and Dian Pramana

Universitas Ekasakti

Abstract

Cocoa is one of the leading commodities in West Sumatra from the plantation sector. Cocoa skin waste is still of little use. One of the uses of cocoa pods is used as raw material for making liquid smoke. The purpose of this study was to determine the physical properties of liquid smoke of cocoa pods with different levels of water content of raw materials and different pyrolysis temperatures. This research was conducted in April - May 2019. The results showed that the liquid smoke of cocoa pods at different levels of water content and pyrolysis temperature produced brownish yellow liquid smoke color and no turbidity. The color of the liquid smoke is calculated based on the Hue degree value. 10% water content at temperatures of 200, 300 and 400oC obtained 4.573; 4,513 and 4,483oHue. 15% water content at temperatures of 200, 300 and 400°C obtained 4,454; 4,478 and 4,420oHue. 20% water content at temperatures of 200, 300 and 400°C obtained 4,388; 4,356 and 4,334oHue. Moisture content of 25% at temperatures of 200, 300 and 400oC obtained 4,337; 4,264 and 4,217oHue. Analysis of liquid specific gravity is generally above the specific gravity of water. Specific weight of 10% cocoa skin moisture at temperatures of 200, 300 and 400oC obtained 1,000963 ; 1,000953 and 1,00148. The weight type of the 15% cocoa skin moisture content at temperatures of 200, 300 and 400°C obtained 1,001401; 1,001677 and 1,002753. The weight type of the 20% cocoa skin moisture content at temperatures of 200, 300 and 400oC was obtained 1.004195 ; 1,004629 and 1,004754. The weight type of the 25% cocoa skin moisture content at temperatures of 200, 300 and 400oC was obtained 1.004288 ; 1,004735 and 1,005341.

Keywords: Liquid smoke, moisture content, pyrolysis, temperature, color, specific gravity

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Study of the physical properties of liquid smoke from cocoa rind on moisture content and different pyrolysis temperature

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Study of the physical properties of liquid smoke from cocoa rind on moisture content and different pyrolysis temperature

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Abstract. Cocoa is one of the flagship commodity of West Sumatera from plantation sector. Cocoa skin waste is still little in utilization. One of the utilization of cocoa fruit skin is made raw material for liquid smoke making. The purpose of this research is to know the physical properties of liquid smoke of cocoa fruit skin with different levels of water content of raw materials and the temperature of pyrolysis differently. This research has been conducted in April – May 2019. The results showed that the liquid smoke of the cocoa fruit skin at different levels of water and the temperature of pyrolysis resulted in a brownish-yellow liquid smoke color and no turbidity. The liquid smoke color is calculated based on Hue degree values. Water content of 10% at 200, 300 and 400^{o}C temperature obtained 4.3374; 4.2635 and 4, 2169 ^{o}Hue. Water content of 15% at 200, 300 and 400^{o}C temperature obtained 4.3878; 4.3561 and 4, 3342 ^{o}Hue. Moisture content of 20% at temperatures 200, 300 and 400^{o}C obtained 4.4776; 4.4537 and 4, 3342oHue. Water content of 25% at 200, 300 and 400^{o}C temperature obtained 4.5730; 4.5134 and 4, 4829^{o}Hue. The analysis of liquid smoke type weights are generally above the water. The weight of 10% cocoa water content in the temperature of 200, 300 and 400^{o}C obtained 1.000963; 1.000953 dan1,00148. The weight of the cocoa content type is 15% at a temperature of 200, 300 and 400^{o}C obtained 1.001401; 1.001677 and 1.002753. The weight of the type of cocoa skin moisture content is 20% at 200, 300 and 400^{o}C obtained 1.004195; 1.004629 and 1,004754. The weight of the type of cocoa skin moisture content is 25% at 200, 300 and 400^{o}C obtained 1.004288; 1.004735 and 1.005341.

1. Introduction

Liquid smoke is a chemical compound from the smoke of the results of biomass pyrolysis then condensed thereby forming fluid. The role of liquid smoke in the food industry is as preservatives (food preservative) especially anti-microbial food (antimicrobial agent) and taste givers and aromas in food products (flavouring agents). In liquid smoke contains approximately 400 chemical compounds but only about 200 types that have been identified through various studies are then grouped based on the main components of the compound's constituent such as phenolic, carbonyl and acid [1].

The raw material of liquid smoke manufacturing is sourced from different materials. Some research reports that have been done in the manufacture of liquid smoke derived from coconut shell raw materials [2]; [1]; [3], cashews bark [4], coconut fibers [2]; [5], the solid waste of palm oil (Gani et al, 2014; Oramahi et al, 2010), the nyamplung shell (Wibowo, 2012), laban's timber [6], acacia wood [7] and a rubber shell [8].

Utilization of cocoa fruit peel as a result of cocoa plantation is still very small. [9], cocoa bark can be used as a concentrated green as an antibacterial. [10], utilizing the bark of cocoa as the raw material of active carbon manufacturing. [11], utilizing the bark of cocoa as a material adsorbent rhodamine B. [12],

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extracting the bioactive components of the cocoa peel as an antioxidant and antimicrobial, [13], extracting the bark of the cocoa fruit cook and the skin of the young cocoa fruit as an antioxidant.

Now days there are still few reports that use cocoa peel as raw material for liquid smoke making. [14] It uses cocoa bark as raw material for liquid smoke making, but has not reported the physical properties of liquid smoke produced. Likewise, [15] The results of the research utilizing cocoa peel as raw material for liquid smoke only reported the total levels of phenol and its antibactericates. Some research results report that moisture content and pyrolysis temperature affects the physical and chemical components of the liquid smoke produced.

Based on the explanation above, researchers have conducted research on making liquid smoke using cocoa leather as raw material to utilize the waste of cocoa fruit skin that has not been utilized with different levels of moisture content and pyrolysis temperature.

2. Materials and methods

Research has been conducted in the Agricultural Technology Laboratory of Agriculture University and Laboratory of Microbiology and Biotechnology of Agricultural Products from Andalas University in April – May 2019. The study uses exploratory research plans with differing levels of raw material moisture content and the temperature of liquid smoked pyrolysis. Liquid smoke in can by using pyrolysis tools.

The material used in this research is cocoa skin that obtained from Lubuk Minturun village of Padang City which has been regulated according to treatment (10, 15, 20 and 25%) and carried out the process of pyrolysis at different temperatures (200^{o}C, 300^{o}C and 400^{o}C) until the liquid smoke obtained cocoa skin, pH buffers 4 and pH 7, alcohol 96%, aquades, tissues, spray bottles and GEGEP.

The equipments used are 1 (one) set of pyrolysis, oven, colori meter (Hunter Lab), desicator, erlenmeyer 250 ml, 1000 ml cup cups, mouthpiece, picnometer 25 ml, pH meter and colori meter tool.

2.1 Making liquid smoke cocoa leather [2]

Cocoa peel weighed 48 kg and then performed a size reduction using machetes. The drying is done under the sun until it reaches the moisture content according to the treatment of 10 – 25%. It is then inserted into the pyrolysis at an initial temperature of 27^{o}C and closed tightly until airtight. The pyrolysis process is carried out using the temperature according to the treatment of 200, 300 and 400^{o}C for 2-4 hours until the liquid smoke stops dripping from the pyrolisator. During the pyrolysis process, make sure that the water is flowing and the condenser spiral pipe is perfect for condensation.

2.2 Analytical procedures

The parameters observed in this study include pH value, color and weight type.

2.2.1 pH values [16]. PH-meter electrode before use is standardized using buffer solution namely acid buffer (pH 4), neutral buffer (pH 7) and buffer base (pH 10). Then cleaned using aquades and dried, the sample of liquid smoke as much as 5 mL is inserted into the Beaker glass, the pH electrode is dipped in the sample, then left until the stable readings are obtained, the pH value can be directly on a pH meter scale.

2.2.2 Color Analysis [17]. This color test is performed using the Hunterimeter ColorFlex EZ Colon tool. This tool uses white ceramic, which before the test is first calibrated. Colors can be calculated using the formula:

$$\text{Color} = 100 - ((100\text{-L *})\ 2 + \text{A * } 2 + \text{b * } 2)\ ½ \qquad (1)$$

Where the values are L *, A * and b * with a value range of 0 to ± 100. L * States the Brightness (Lighness) parameter with a value of L * value of 0 means black and 100 white. The value of L * States the reflected light that produces the white, gray and black accorded color. A * represents the red – green

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mixed chromatic color with a value of + A * (positive) from 0 to + 100 for the red color and the value – A * (negative) of 0 to-80 for the green color. While B * States the chromatic color of the yellow blue mixture with a value of + b * (positive) from 0 to + 70 for the yellow color and value – b * (negative) from 0 to-70 for the blue color.

2.2.3 Type weights [16]. Prepared tools and materials then the 25 ml Piknometer is cleaned with distilled water, then rinsed with alcohol. Piknometer is dried in a 100^{o}C temperature oven for 15 minutes and then chill at room temperature. Removed the pycnometers after drying and weighed empty weight on the analytical scales record the results. Weighing is done 3 times. Inserted in the basin containing ice/cold water, empty pycnometers, until it reaches 25^{o}C and weighed with analytical scales and recorded. Aquades is removed from the pynometer and then rinsed with alcohol 70% laludried. Fill the empty pycnometers with a sample with the corresponding volume indicated on the pycnometers. Note the weight of the samples with analytical scales. Calculated the weight of each sample type includes Aquades, by calculating the difference from the sample of the pycnometers weighing with empty piknometers.

3. Results and discussion

3.1. Liquid smoke pH value of cocoa fruit bark

The principle in testing the degree of acidity (pH) by using the pH meter equipment is a method of measuring pH based on the measurement of hydrogen ion potentiometric/electrometry using a pH-meter. Before use, the pH-meter equipment is calibrated with solution buffers according to the equipment's instructions on each measurement. The pH value of liquid smoke cocoa fruit bark tends to be acidic with differing levels of raw material moisture content and pyrolysis temperature. The pH value is one of the resulting liquid smoke quality parameters. Measurement of pH value in liquid smoke produced aims to know the level of the process of decomposition of raw materials to produce organic acids in the form of pyrolysis the liquid smoke pH value of the cocoa fruit skin is in table 1.

Table 1. Liquid smoke pH value of cocoa fruit peel

Treatment	Temperature (^{o}C)	pH
Water content 10%		5,0
Water content 15%	200	5,1
Water content 20%		5,3
Water content 25%		5,4
Water content 10%		4,8
Water content 15%	300	4,9
Water content 20%		5,0
Water content 25%		5,1
Water content 10%		4,7
Water content 15%	400	4,8
Water content 20%		4,9
Water content 25%		5,0

Based on table 1 shows the pH value of liquid smoke of the cocoa peel range between 4.7 – 5.4. This value belongs to the acid category. The lower the moisture content of raw materials then the lower the liquid smoke pH value of cocoa skin produced. Similarly, the temperature of pyrolysis, the higher the temperature of liquid smoke pyrolysis, the lower the pH value of liquid smoke produced by the cocoa fruit skin. This indicates that the pyrolysis process with an increasingly high temperature of up to 400^{o}C lasts well. This results according to the report [2] which uses liquid smoke pyrolysis temperatures up to 400°C.

If low pH value means smoke produced high quality especially in terms of its use as food preservatives [18]. The low pH value overall affects the lifetime value and the shelf life of the smoke product or its organoleptic properties. Because at low pH microbes or bacteria as disruptor in the preservation process tends not to be alive and breeding well. In accordance with the explanation [19], Measurement of pH value in liquid smoke aims to determine the level of the process of decomposition of raw materials by pyrolysis. Low pH value means smoke produced high quality especially in terms of its use as food preservatives.

Raw material water content affects the resulting liquid smoke pH value. This is in accordance with the results of the study [5] stating that the resulting liquid smoke pH value is increasing in line with the increased moisture content of cocoa berries. High moisture content in raw materials will reduce the quality of liquid smoke produced. Due to the high amount of water in the material will evaporate during pyrolysis. The resulting liquid smoke will contain a lot of water, so the quality of liquid smoke decreases. The decrease in liquid smoke will affect the acidity in the liquid smoke, so that the value of the pH rises. This acidity is derived from compounds contained in liquid smoke, especially acetic acid and other carboxylic acids [1]. The liquid smoke pH value of the research results in the same with the results of the study conducted by [20] with liquid smoke pH values ranging from 4.3 – 4.7.

3.2. Color liquid smoke cocoa skin

In general, the color of the liquid smoke pyrolysis of the cocoa skin is yellow brown. Test the color value of liquid smoke of the cocoa fruit skin using the tool Hunter Lab. The color value of liquid smoke of the cocoa fruit skin is in table 2.

Table 2. Color values liquid smoke skin cocoa fruit

Treatment	b*	Temperature (°C)	Hue (°)
Water content 10%	0,37	200	4,3374
Water content 15%	0,44		4,3878
Water content 20%	0,59		4,4537
Water content 25%	0,62		4,5730
Water content 10%	0,44	300	4,2635
Water content 15%	0,46		4,3561
Water content 20%	0,48		4,4776
Water content 25%	0,49		4,5134
Water content 10%	0,46	400	4,4829
Water content 15%	0,46		4,4196
Water content 20%	0,48		4,3342
Water content 25%	0,51		4,2169

From table 2 above can be seen the color value of liquid smoke produced cocoa leather range between 4.2169 – 4, 5730 °Hue. Based on the above data can be known color liquid smoke of cocoa yellow brown fruit skin. The results of the study [2] gained degrees of Hue of liquid smoke from coconut shells, coconut fibers and cinnamon between 2.58 to 5.01 °Hue. The color of the liquid smoke that results in brown and clear yellow. The value B * States the chromatic color of the yellow blue mixture with a value of + b * (positive) from 0 to + 70 for the yellow color. The temperature of the liquid smoke pyrolysis affects the color of the resulting liquid smoke, the higher the pyrolysis temperature then the resulting color will be increasingly brownish yellow. The color of liquid smoke is influenced by the temperature of pyrolysis causing degradation (cellulose, hemiselulose and lignin). This is in accordance with the results of the research conducted by [21] that the change in the temperature caused the occurrence of discoloration in liquid smoke. The higher the pyrolysis temperature then the darker the liquid smoke is produced. It is reinforced by the results of the study [2] that the longer the pyrolysis time and the higher the pyrolysis time then the color of the liquid smoke will be more brown and concentrated as well as the resulting smell stinging and sharp.

The results of this study correspond to the results of the research [22] and [23] which gets the color of the liquid smoke brownish yellow. Based on the above data can also be seen that the water content of raw materials affects the color of liquid smoke produced, the higher the water content of raw materials then the brighter (yellow) liquid smoke produced. [2] also obtained liquid smoke from various raw materials with a liquid smoke color of yellow to yellow tanned.

3.3. Weight value of liquid smoke type

Type weight is the ratio between the weight of an example with volume. In the physical properties of liquid smoke, the weight of the type does not relate directly to the low high quality of liquid smoke produced. However, this type of weight can indicate the number of components in liquid smoke. Determination of the weight of liquid smoke type is carried out using a piknometer. The weight value of liquid smoke of the cocoa skin can be seen in table 3.

Table 3. The value of liquid smoke types of cocoa fruit skin

Treatment	Tempeture (^{O}C)	Type weights
Water content 10%	200	1,0096
Water content 15%		1,0140
Water content 20%		1,0419
Water content 25%		1,0428
Water content 10%	300	1,0095
Water content 15%		1,0167
Water content 20%		1,0462
Water content 25%		1,0474
Water content 10%	400	1,0148
Water content 15%		1,0275
Water content 20%		1,0475
Water content 25%		1,0534

Based on table 3 above can be seen the weight of liquid smoke type of cocoa fruit skin with different levels of moisture content and pyrolysis temperature. The observed weight of the pyrolysis of liquid smoke type showed that different levels of moisture affect the weight value of the resulting liquid smoke, but the difference in the weight value of the type is not much different between the water content of 10% and 25%. The type weights of the various liquid smoke samples show a not much different value i.e. ranging from 1.0096 to 1.0534.

The result of the type of weight obtained is not much different from the results of the study [2] which obtained the weight of liquid smoke ranging from 1.0167 to 1.0467. The results of this research are also almost identical with the research report [5] with the weight value of liquid smoke produced from 1.005 to 1.009. The weight value of the liquid smoke of the cocoa leather has fulfilled the quality standard of liquid smoke is large of 1.005.

4. Conclusion

From the results of the study can be concluded that the liquid smoke of the cocoa fruit skin at a level of moisture and different pyrolysis temperature results in liquid smoke brownish yellow and there is no turbidity. The liquid smoke color is calculated based on Hue degree values. Water content of 10% at 200, 300 and 400°C temperature obtained 4.3374; 4.2635 and 4, 2169° Hue. Water content of 15% at 200, 300 and 400° C temperature obtained 4.3878; 4.3561 and 4, 3342°Hue. Moisture content of 20% at temperatures 200, 300 and 400° C obtained 4.4776; 4.4537 and 4, 3342°Hue. Water content of 25% at 200, 300 and 400° C temperature obtained 4.5730; 4.5134 and 4, 4829°Hue. The analysis of liquid smoke type weights are generally above the water. The weight of 10% cocoa water content in the temperature of 200, 300 and 400° C obtained 1.000963; 1.000953 dan1,00148. The weight of the cocoa content type is 15% at a temperature of 200, 300 and 400° C obtained 1.001401; 1.001677 and 1.002753. The weight of the type of cocoa skin moisture content is 20% at 200, 300 and 400° C obtained 1.004195; 1.004629 and 1,004754. The weight of the type of cocoa skin moisture content is 25% at 200, 300 and 400° C obtained 1.004288; 1.004735 and 1.005341.

Anknowlegment

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ACCEPTANCE LETTER

Dear **Dr. I Ketut Budaraga**
Universitas Ekasakti.

We are pleased to inform you that your paper based on your abstract entitled:

Physical Properties of Liquid Smoke From Cocoa Skin with Differences of Water Levels and Pirolysis Temperature

has been accepted by the Scientific Committee **to be presented** at the 3nd International Conference on Agricultural Engineering for Sustainable Agricultural Production (AESAP 2019), on 14 - 15 October 2019, at IPB International Convention Center Bogor, Indonesia.

In order to confirm your presentation and allocate it on the program schedule, please proceed this announcement with the transfer payment of your participation not later than 22 September 2019 in amount of IDR 1,750,000 (not include publication fee, selected paper that will be charged IDR 1,000,000 per paper for IOP Publication) to:

Account Name	: Sri Endah Agustina
Account Number	: 0219123720
Bank	: BNI Cabang IPB Bogor
SWIFT CODE	: BNINIDJA BGR

Please note that accompanying participant will be charged IDR 1,000,000 per person.

The Scientific Committee request you to submit your full paper by 22 October 2019 to be reviewed for the IOP publication. Please refer the paper writing guideline placed in the website (http://aesapconference.org/), only presented and reviewed papers will be eligible for the IOP Publication.

Please refer to the conference website for the registration and all necessary information.

We are looking forward to seeing you in Bogor.

Best Regards

Dr.Ir. Edy Hartulistiyoso, M.Sc.
Chairman

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Certificate
of Appreciation

I Ketut Budaraga

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