SCIENTIFIC PROGRAM BOOK

The 2nd International Undergraduate Conference on Agriculture & Life Sciences (Online Conference)

ILCA 2022
The 2nd International Undergraduate Conference on Agriculture & Life Sciences (Online Conference)

September 25th, 2022
Faculty of Agriculture, University of Bengkulu
Bengkulu, Indonesia

Scientific Program Book

List of Committee

Organizer

Faculty of Agriculture, University of Bengkulu, Indonesia

Co-Organizer

Princess of Naradhiwas University, Thailand
University Malaysia Kelantan, Malaysia
South Eastern University of Sri Lanka, Sri Lanka
Yala Rajabhat University, Thailand
Prince of Songkla University, Pattani Campus, Thailand
University of Garmian, Iraq
Omar Al-Mukhtar University, Libya

Keynote Speaker

Prof. Dr. Iin Purwati Handayani, **Murray State University, USA**
Prof. Dr. Jakhhaphan Pitchayapipatkul, **Princess of Naradhiwas University, Thailand**
Dr. Heri Dwi Putranto, **University of Bengkulu, Indonesia**
Dr. Muneeb M. Musthafa, **South Eastern University of Sri Langka, Sri Langka**
Dr. Raja Ili Alrina binti Raja Khalif, **University Malaysia Kelantan, Malaysia**

Steering Committee	:	Prof. Dr. Ir. Dwi Wahyuni Ganefianti, M.S
		Yansen, S. Hut., M.Sc., Ph. D
		Dr. Indra Cahyadinata, S.P., M.Si.
		Agustin Zarkani, S.P., M.Si., Ph. D
Chair Person	:	Dr. Nurmeliasari, S.Pt., M. Sc
Secretary	:	Nola Windirah, S.P., M.Si.
Treasure	:	Dr. Mimi Sutrawati, S.P., M.Si.
Member	:	Dr. Putri Suci A., S.P., M.Si.
		Anandyawati, S.P., M.Si.
		Agung Hasan Lukman, S.Si., M.I.L
		Sistanto, S.Pt., M. Si
		Amir Husaini Karim Amrullah, S.Pt., M. Sc
		Muhammad Dani, S.Pt., M. Sc
		Muhimatul Husna SP., M. Si
		Syafa Aisyah Putri
		Fikri Luthfi Fahrni
		Nadia Puti Khairunnisa
		Widia Yulanda
		Fika Yuni Irmanita
		Tedy Syah Van Royen
		Rahrnad Hidayat
		Ana Meinawati
		Rizki Amelia

TABLE OF CONTENTS

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Microplastic Pollution in Marine Ecosystem: Special Focus on Indonesia

Muneeb M. Musthafa[1] and MMM. Najim[2]
[1]Department of Biosystems Technology, Faculty of Technology, South Eastern University of Sri Lanka, University Park, Oluvil, #32360, Sri Lanka.
[2]Department of Zoology and Environmental Management, Faculty of Science, University of Kelaniya, Kelaniya, #11600. Sri Lanka.

*Corresponding author: muneeb@seu.ac.lk

Abstract

Microplastics in marine ecosystems have become an emerging environmental issue around the world. Human plastic consumption has increased at a dramatic rate over the years leading to detrimental impacts. Marine plastic levels in marine environments have increased through land or sea-based sources and has become persistent and the pollution is ubiquitous in the oceans. Plastic waste pollution is one of the threats to the environment and currently a concern in the world, especially in territorial waters of the sea. Volume of plastic wastes entering the sea waters every year is increasing. Plastic waste added in our oceans has been estimated to be eight million metric tons every year. Owing to their small size, microplastics are considered bio-available to organisms throughout the food web. Their composition and relatively large surface area make them prone to adhering to waterborne organic pollutants and contribute to leaching of plasticizers that are considered toxic. Ingestion of microplastics may therefore be introducing toxins to the base of the food chain, from where there is potential for bioaccumulation. Microplastics that have been transferred into marine and terrestrial environments can have implications on the health of animals of all trophic levels and even humans. Indonesia is the country only second to China in the world for plastic waste pollution of the marine ecosystems, however, representative studies on microplastic pollution in Indonesia are low. Therefore, plummeting plastic emissions to marine ecosystems in Indonesia will have a large impact on both reduction of global plastic emissions to the oceans, and on the protection of global biodiversity. Academic community in Indonesia must proactively get engaged in reduction of microplastic pollution thereby reduce the impacts on the environment.

Keyword: blue economy, biodiversity, emission, Indonesia, pollution

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The Effect of Immersion in Boiled Water of Belimbing Wuluh (*Averrhoa bilimbi* L.) Leaf on Oxidation, Foamability, and Sensorial Properties of Layer Egg

Dina Amelia[1*], Suharyanto[2], Kaharuddin[2], D., and Edi Soetrisno[2]
[1] Department of Animal Science, Faculty of Agriculture, University of Bengkulu (student)
[2] Department of Animal Science, Faculty of Agriculture, University of Bengkulu (supervisor)

**Corresponding author: dinaaaameliaa0@gmail.com*

Abstract

One of the main problems of eggs is oxidation. Preservation of eggs quality has been explored, but most preservation is by using synthetics agents that can cause negative side effect for consumers. Retarding the eggs deterioration should be employed by using natural agents. *Belimbing wuluh* leaf (BWL) is potentials to be applied. BWL contains secondary metabolites such as phenolics compounds, mainly flavonoids, saponin, and tannin that can be employed to prolong shelflife of eggs. Immersion of quail egg by boiled water of BWL for 24 h could stand quality and prolong shelflife of quail eggs.

This study was aimed to evaluate the oxidation, foamability, and sensory properties of eggs immersed in boiled water of BWL. The sensorial properties were evaluated by 25 untrained panelists among Animal Science students of Unib. As many as 120 fresh eggs obtained from local layer farm were randomly distributed into 15 experiment unit (5 treatments and 3 replication). The treatments employed were egg without immersed (T0), eggs were immersed in: water (T1), boiled water of BWL 15% (T2), boiled water of BWL 30% (T3), and boiled water of BWL 45% (T4). The immersion condition was in 28ºC-30ºC of water for 24 h. The collecting data were at 10 and 20 days of storage in room temperature. ANOVA and post hoc test by DMRT were employed for data analyses with significancy level 0.05.

The result of the study indicated that immersion treatments (T2-T4) lowered the oxidation of eggs both in 10 and 20 days of storage expressed in mg MDA/kg. This result showed that T3 and T4 was even could retarding oxidation at 20 days of storage. While T0 and T1 were not different both at 10 and 20 days of storage. Data obtained were 1.846, 1.794, 1.326, 0.702, and 0.546 mg MDA/kg for T0, T1, T2, T3, and T4 respectively at 10 days of storage. For 20 days of storage, they were 1.976, 1.898, 1.378, 0.624, 0.546 mg MDA/kg for T0, T1, T2, T3, and T4 respectively. These data showed that immersion in boiled water of BWL could retard the oxidation rate. However, all MDA's eggs were fit to Indonesia National Standard stating that food in good condition contains max 3 mg MDA/kg.

The foamability of T3 (422.73 and 567.80%) and T4 (414.52 and 449.94%) was lower than T0 (539.57 and 557.09%), T1 (527.58 and 537.32%), and T2 (511.90 and 515.32%) both in 10 and 20 days of storage. However, foam stability T2 (85.19 and 84.87%), T3 (85.21 and 84.91%) and T4 (85.41%at 10 days of storage only) was higher than T0 (84.28 and 84.60%) and T1 (84.78 and 84.71%) for 10 and 20 days of storage. At

20 days of storage, the foam stability of egg was not different among T0 – T3 (84.60, 84.81, 84.87, and 84.91%) and the lowest foam stability was reached by T4 (83.87%). These results showed that the eggs immersed in boiled water of BWL 15% yielded the best foamability and foam stability of eggs indicated by the steady foamability percentage and highest foam stability of eggs.

On the sensory attributes, the intensity of panelists perception to yolk color, odor, and taste was significant different, whereas the texture was not different. The T3 and T4 generated higher in yellowness of yolk and un-fishy odor of eggs. The taste of T3 and T4 were less delicious than T0, T1, and T2 both in 10 and 20 days of storage. These indicated that the immersion in the boiled water of BWL 15% yielded the higher yellowness of yolk and deliciousness of eggs without any changes in taste and texture of eggs. These results also corresponded to the hedonic results of the sensorial attributes. The immersion in the boiled water of BWL increased the panelists' preferences to yolk color and egg odor. Whereas, the panelists' preferences on taste were significantly decrease at 30 and 45% of BWL (T3 and T4 treatments).

The conclusion is that the best concentration of BWL for preserving layer eggs is 15%. This concentration was enough for decreasing oxidation, yielding the foamability with the highest stability and improving sensorial characteristics of eggs.

Keywords: *Averrhoa bilimbi* L, egg, foamability, oxidation, sensory

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The pH and Total Microbes on Layer Egg (Isa Brown) Immersed in boiled water of Belimbing Wuluh (*Averrhoa bilimbi* L.) Leaf

Marheny[1], T., Suharyanto[2*], Kususiyah[2], and Soetrisno[2], E.
[1] Departmen of Animal Science, Faculty of Agriculture, University of Bengkulu (student)
[2] Departmen of Animal Science, Faculty of Agriculture, University of Bengkulu (supervisor)

**Corresponding author: titiekmarheny19@gmail.com*

Abstract

Egg has become popular foodstuffs for Indonesian people. Unfortunately, egg is a perishable material so a preservation process is needed. Many efforts have also employed to preserve eggs, but most of them were synthetic preservatives which is negative for human. Natural agents have become a choice for food preservative due to health reasons.

Belimbing wuluh (*Averrhoa bilimbi* L) leaf has a potent to be employed for this purpose. Many studies reported that belimbing wuluh leaf (BWL) is rich in polyphenols compounds including tannin. These compounds have antimicrobial and antioxidant activities. Tannin was also reported could coat eggshell of quail eggs. It resulted in the steady internal and external quality of quail eggs during storage. However, application to layer eggs is less studied.

This study was conducted to evaluate the immersion effect of layer egg in boiled water of belimbing wuluh leaf (BWL) on pH and total microbes of the egg. There were 5 treatments employed to the study, namely without any immersion (T0), immersed in water with no BWL (T1), immersed in 15% (T2), 30% (T3), and in 45% of boiled water of BWL (T4). Each treatment was replicated 3 times in a completely randomized design experiment. Eggs were fresh egg (less than 24 h laid) purchase from local layer farmers. Eggs immersed in according to treatment in 28ºC-30ºC of water for 24 h. Variables measurement were conducted at 10 and 20 days of storage. Data were analysed by using ANOVA and post hoc test by DMRT with significancy level of 0.05.

The result of this study indicated that the immersion in water and in boiled water of BWL (15-45%) could decreased the pH value of egg for both storage duration ($P<0.05$). The pH of T0 was 7.51 (10 days) and 7.64 (20 days) and gradually decreased corresponded to the concentration of BWL and they became 7.13 (10 days) and 7.19 (20 days) at T4. Even, the use of BWL could reduce the increment rate of pH at 20 days of storage. The increased pH was 0.13, 0.19, 0.02, 0.03, 0.06 for T0, T1, T2, T3, and T4 respectively. As a result, or it resulted in evaporation prevention an CO_2 lost. Prevented evaporation and lost of CO_2. The lost of CO_2 would result in lower bicarbonate ion and pH increased.

The study also showed that the immersion in boiled water of BWL could reduce the total microbes both in 10 and 20 days of storages ($P<0.05$). The higher BWL concentration, the lower total microbes found in the eggs. The pH obtained at 10 days sotarge were 5.93, 5.94, 5.84, 5.82, 5.74 log cfu/g for T0, T1, T2, T3, T4 respectively. While at 20 days of storage were 6.02, 6.01, 5.94, 5.88, 5.84 log cfu/g for T0, T1, T2, T3, T4 respectively. The data showed that storage duration causes total microbes increase. However, the total microbe's exposure on eggs is fit to Indonesia National Standard which

the prerequisite of total microbes in food not more than 1 x 10^5 cfu/g. All data obtained in log are less than 1 x 10^5 cfu/g.

The lower of total microbes in T2-T4 was most probably caused by the bioactive compounds contained in BWL, mainly tannin. There are two mechanisms how tannin can reduce the total microbes in eggs. First, tannin coats the eggshell of eggs so that prevent contaminant from outside into inside the eggs. Secondly, tannin plays a role as denaturant of microbial protein so that disturbs and kills microbes. By immersing eggs in boiled water of BWL, bioactive compounds, mainly tannin, diffuse into eggs and coat the eggshell. These conditions result in a lower microbe in eggs.

It could be summarized that the immersion of eggs in boiled of BWL 15-45% decreased pH value and total microbes. It can be employed at least 15% of BWL in boiled water that can reduce the total microbes and pH as well as retard microbes' growth during storage.

Keywords: *Averrhoa bilimbi* L, egg, immersion, pH, total microbes.

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Marketing Strategy of The Household Industry of Rendang Lokan Specialty Food of Mukomuko Regency

Sinta, K. A.*, Utama, S. P. and Sriyoto, S.
Department of Agricultural Socio-Economics, Agribusiness Study Program, Faculty of Agriculture, Bengkulu University

*Corresponding author: kikimasinta@gmail.com

Abstract

This study discusses the marketing strategy of the household industry of rendang lokan specialties in Mukomuko Regency. The research was conducted in Mukomuko City District, Mukomuko Regency using the (purposive) method or carried out deliberately with the consideration that the district is a district engaged in the dominant specialty food household industry in Mukomuko Regency. This study aims to analyze the marketing strategy of rendang lokan specialties in Mukomuko Regency. The data collected in the study are primary and secondary data. Primary data is data obtained from informants from direct interviews with several lists of questions (questionnaires) that have been prepared previously while secondary data is obtained from related agencies or institutions related to this study. In this study, the determination of the sample using the snowball sampling method by meeting one rendang lokan businessman to show the next informant according to the required characteristics so that as many as 2 informants were obtained. The data that has been obtained from the platform is then analyzed using the SWOT analysis method.

SWOT analysis techniques are applied to achieve the goal of determining the company's strategy in marketing to be achieved by analyzing. There are several processes that must be carried out in a SWOT analysis so that the decisions obtained are more precise with the stages of data collection of evaluation of external and internal factors, the stage of analysis with the creation of internal, external and SWOT matrices and the decision-making stage. From the results of the study, it shows that there are four strategies that can be applied to the marketing of the household industry of rendang lokan specialties in Mukomuko Regency. First, increasing business capital with the availability of raw materials means that industrial owners use personal capital in running their business, therefore rendang lokan household industry entrepreneurs can hold raw materials, tools, and technology to develop rendang lokan products to produce in large quantities.

Secondly, taking advantage of market opportunities by increasing production and selling prices of products means seeing market conditions in the procurement of rendang lokan as a specialty food and souvenirs from Mukomuko Regency is increasingly higher is an opportunity that can be utilized by rendang lokan entrepreneurs to increase production and sell to consumers, companies or institutions that are regional in promoting specialties below the prices of competitors in large companies. Third, increasing the production and selling price of rendang lokan to consumer demand means

that the high level of consumer demand for rendang lokan specialties is also an opportunity for entrepreneurs of the rendang lokan household industry to increase capital in the provision of raw materials to increase production so that high consumer demand can be met by the industry. Fourth, planning production time and planning raw materials in marketing rendang lokan means that in the production process, time planning and raw material planning are one important thing so that the production time is right on target so that there is no shortage or oversupply while raw material planning can minimize the occurrence of supply shortages in certain seasons, so that the production and marketing process can continue to run. With a strategy in marketing, product marketing will be more optimal so that the household industry can generate maximum profits.

Keywords: Marketing Strategy, Specialty Food, Home Industry, Rendang Lokan, Lokan

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Analysis of Consumer Behavior on the Decision-Making Process of Purchasing Kebab Products in The City of Bengkulu (Case Study: Cheap and Champion Culinary Palupi)

Sari, M.F*, Priyono, B.S. and Novanda, R. R.
Department of Agricultural Socio-Economics, Agribusiness Study Program, Faculty of Agriculture, Bengkulu University

*Corresponding author: melisapermatasari49gmail.com

Abstrack

Micro, small, and medium enterprises or commonly abbreviated as UMKM are businesses created by individuals or individuals, households, and small business entities that already have the criteria set by law no. 20 year 2008. UMKM in Bengkulu Province, the total number of active UMKM is relatively high, as many as 462111 and the largest UMKM in Bengkulu Province, namely in Bengkulu City as many as 44472, amounting to 96.04% of the number of UMKM in Bengkulu Province. So that the development of UMKM in Bengkulu City is categorized as high because of the large number of UMKM in Bengkulu City. The specialty of the Palupi Culinary Kebab is that the manufacturing process is very hygienic because the ingredients used starting from the sauce and mayonnaise are self-produced so that the quality is guaranteed and also the vegetables are from their own plants because the owner cultivates vegetable plants at home only for the Kebabs, so that the vegetables that are used for the kebab The Kebab chosen for the Kebab is indeed fresh vegetables and also Kebab Palupi Culinary has 6 branches spread across the city of Bengkulu, namely Store 1 Simpang Bumi Ayu, Store 2 Padang Jati, Store 3 Lingkar Timur, Store 4 Pematang Gubernur, Store 5 Surabaya, and Store 6 Nusa Indah.

Palupi Culinary Kebab also has a monthly turnover of up to 1000/pcs. This study aims to: (1) analyze consumer behavior towards purchasing decisions of Kebab Palupi Culinary, (2) analyze the relationship between cultural factors, social factors, personal factors and psychological factors on purchasing decisions of Kebab Palupi Culinary (3) analyze the relationship between marketing mix consists of products, prices, promotions and locations related to the purchasing decision of Kebab Palupi Culinary. The results of the study show that the total analysis of consumer behavior factors in making purchasing decisions for culinary kebabs shows that consumer behavior consisting of cultural factors, social factors, personal factors and psychological factors is a strong majority with a percentage of 58% of respondents with an average score of 49.5 being.

At the stage of the purchase decision-making process, the majority value of 56% falls into the necessary category with an average score of 25.5, that overall, it can be concluded that consumers need to carry out five stages of the decision-making process on the purchase of Kebab Palupi Culinary products. The results of the analysis of the relationship between factors and marketing mix with purchasing decisions using Spearman rank calculations, the results of factor calculations are known to have a significance value of 0.000. The relationship between social factors and purchasing

decisions has a significance value of 0.001. Calculation of the relationship between psychological factors and purchasing decisions is known to have a significance value of 0.000. Analysis of the relationship between the marketing mix and purchasing decisions, there are research results. The relationship between products and purchasing decisions has a significance value of 0.000. The results of the price calculation with the purchase decision have a significance value of 0.012. The relationship between the place and the purchase decision of the significance of 0.004. The significance value of the promotion variable with purchasing decisions is known to be 0.041. This means that there is a significant relationship between the factors and the marketing mix with purchasing decisions.

Keywords: kebab, consumer behavior, factors, marketing mix

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Effect of acacia leaves and neem leaves on Growth Performance and carcass quality of Broilers

Sala, K. [1*], Deemea, I.[2] Hadatu, A. [3] Noolaong, J. [4] and Thongdongkham, S. [5]
Faculty of Science Technology and Agriculture (Building 5, 1st Floor) Yala Rajabhat University, 133 Thesaban 3, Sateng, Muang, Yala, 95000 1

**Corresponding author*: Ibrohing.D@yru.ac.th

Abstract

At present, the group of customers or consumer groups are interested in health products. Antibiotic-free broiler breeding in feed and treatment. One interesting option is Turning to natural substances for example, herbs or plants used in animal production with acacia leaves (*Leucaena leaf*) is one of the raw materials that farmers use in animal feed, especially poultry. Therefore, the use of acacia leaves in poultry production is one possible approach. in line with market conditions and meet the needs of consumers who want to choose to consume animal products that are fed natural systems and help reduce the risk of antibiotic use. Leaves to the growth of broilers at 5 percent in the feed the experiment was conducted in 120 broilers aged 2–5 weeks. The experiment was divided into 4 groups, 3 repetitions of 10 each. The chickens were raised in an open house 2 × 3 m. Each day. And water fully Weigh the amount of food provided. The amount of food left every day Total weight of all chickens each week. Until the end of the trial period Using a Completely Randomized Design (CRD) plan.

From the experiment it was found that Broilers were fed a diet fortified with Moringa leaves. Tendency to the average feed intake was 103.58 and the conversion rate to 1.82 throughout the experiment. The control diet had a growth rate of 640.60 and a mean body weight of 1988.00 throughout the experiment. And the weight at the end of the experiment was 2002.67Moringa leaf supplement Higher than other groups although there was not statistically difference (P> 0.05), the increased weight was significantly different. Meal replacement rate and the average growth rate of cassia leaves and acacia leaves There was not statistically difference (P> 0.05). Effect of acacia leaves on growth performance and carcass content of broiler chickens. It was found that the group of broilers who received the ready-made formula mixed with acacia leaves 1% had average body weight. Average daily growth rate and feed change rate that was better than the broilers in the control group and broilers fed 3% and 5% of the finished feed mix with basil leaves and had lower feed intake than the other groups.

Keywords: acacia leaves, neem leaves, growth Performance, and broilers

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The Internet of Things Technology for Hydroponic Fodder Production System

Kagibeusa, M.[1] Poano, H.[1] Aahama, S.[1] Adulyasas, A.[1*]
[1] Department of Computer Science, Faculty of Science Technology and Agriculture, Yala Rajabhat University, Yala, Thailand, 95000

**Corresponding author: attapol.a@yru.ac.th*

Abstract

Farmers are having difficulty feeding their livestock due to the dramatically rising cost of ingredients. Fodder may be an alternative source with higher nutrients and a more reasonable price than the traditional feeding method, which can feed various livestock for milk and meat production. Thus, it is worth finding an effective cultivation system that can produce good outcomes in terms of quality and quantity of yield and cultivating time consumed. In general, fodder can be grown from various types of grains, such as beans and corn kernel, depending on local availability. Using a good size of plastic trays, such grains can be sprouted by spraying water every day without soil, so-called a hydroponic fodder production system. Within seven days, fodder would be ready to harvest and could be directly fed to livestock. Then, the new crop can be continuously cultivated for the next seven days.

However, such fodder cultivating tasks added on the busy days of farmers could be challenging. Therefore, an Internet of Things (IoT) technology becomes essential to maximise yield and minimise time spent in fodder production. This research aims at designing and applying IoT to automatically monitor and control a hydroponic fodder production system, called an automated hydroponic fodder production system (AHF). The AHF system monitors ambient within fodder farms, namely temperature, relative humidity, soil moisture sensor light, and moisture in the trays. All the sensed data are sent through internet networking and recorded on the cloud. The recorded data will be analysed, and the AHF system will act accordingly. Significantly, the moisture from monitoring the fodder trays is the primary condition that the AHF system constantly considers and decides whether to spray water or not.

The AHF system is composed mainly of hardware and software. In the hardware, NodeMCU is used as a microcontroller connected with sensors. There are four types of sensors in a box, which are DHT22 for temperature and relative humidity monitoring, a soil moisture sensor for monitoring moisture fodder trays, a photoresistor for light monitoring, and a dissolved oxygen sensor for water oxygen monitoring. For the software, an Arduino IDE is used as a tool to implement coding embedded in the NodeMCU. The NodeMCU connects to the Internet using a WiFi module in itself. All sensed data are sent to the ThingSpeak website as the system's database on the cloud. From the cloud, the data is analysed; if moisture tendency is lower than 25% or temperature is beyond 35°C, then the command to activate the water pump will be sent to the NodeMCU. On the other hand, the water pump will be turned off when one of those conditions is false.

With the AHF system functioning properly, farmers need not manually spray water twice a day. Instead, they can occasionally online monitor the fodder farm. Therefore, they can spare time while the fodder production still is in control. For investment, farmers may be required an additional budget for installing the AHF system. However, it fairly costs only one time of 280$, which is much lower than the budget for the traditional feeding material. Moreover, the experimentation with the manual operation of the corn fodder production has shown that 1 kg of corn kernel weight produced 4 kg of fodder weight. Thus, with the AHF system in progress, the quality and quantity of fodder yield could be expected to be higher than one with the manual treatment.

Keywords: fodder, corn kernel, internet of things, IoT, automation system

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Body Weight Gain of Pre-Weaned Nubian Goats Fed with Indigofera Zolingeriana And Azolla Microphylla Based Pellets

Putra, Q. A.,[1*], Dinarko, W.T.[1], Kumalasari, W.[1] Nurmeiliasari[1], Amrullah, A. H. K[1], Firison, J.[2], and Kusnadi, H.[2]
[1]Department of Animal Science, Faculty of Agriculture, University of Bengkulu, Indonesia
[2]National Research and Innovation Agency

***Corresponding author: qudhratullahputra@gmail.com*

Abstract

Pre-weaning growth is very important because it determines the next growth. The provision of pre-weaning goats feed is not only influenced by the nutritional content but also the characteristics of the feed. One of the feed ingredients that can be used is *Azolla Microphylla*. This water fern from the Salviniaceae tribe is rich in protein, essential amino acids, vitamins, and minerals. The composition of nutrients in *Azolla microphylla* is dry matter 89.73%, organic matter 75.73 – 82.66%, crude protein 22.84 – 35.49%, crude fiber 14.7%, ether extract 3.7 – 4, 5%, ash 17.34 – 24.26%, calcium 1.64 – 2.58%, phosphate 0.26 – 0.34%, potassium 2.71%, neutral detergent fiber 54.85%, acid detergent fiber 36.57%, vitamins B, B12, and beta carotene.

Pre-weaned ruminants do not yet have a fully developed rumen. The high crude fiber and nutrient content of *Azolla microphylla* is expected to stimulate rumen development and increase the growth of pre-weaned Nubian goats. This study aims to determine the body weight gain of pre-weaned Nubian goats given concentrate in the form of pellets based on *Azolla microphylla* with different levels of administration. The research was carried out for 32 days from March 13 to April 14 2022 at LPPB Pondok Kubang, Central Bengkulu, Bengkulu. This study used 15 pre-weaned Nubian goats with an average weight of 13.51 kg. The feed ingredients used were *Azolla microphylla*, milled corn, bran, and molasses. The method used in this study was a completely randomized design (CRD) consisting of 3 treatments and 5 replications with each replication consisting of 1 goat. The treatment given is P0 = control. P1 = 50% *Azolla* + 20% Milled Corn + 25% Bran + 5% Molasses. P2: = 75% *Azolla* + 10% Milled Corn + 10% Bran + 5%. Feeding was carried out 3 times a day with the amount of feeding based on the amount of 10% of body weight with the main feed given to each treatment in the form of forage Indigofera sp. as much as 1.5 kg / head / day.

Pellets is given as much as 150 grams/head/day in the form of pellets to ensure all feed is consumed and improve palatability. Milk is given once a day as much as 0.7 liters / head / day. The variables observed in this study were body weight gain, consumption, and *feed conversion ratio*. Consumption data were collected by recording the difference between feeding and the rest of the feed given, while data collection for body weight gain was carried out by weighing every week starting from weighing the first day of the study, the first week, the second week, the third week and the fourth week. The data obtained were analyzed using uniformity analysis (ANOVA). Based on the results of the study, the treatment of *Azolla microphylla* had no significant effect (P>0.05) on body weight gain and

feed consumption of pre-weaned Nubian goats. The results showed that the average weekly weight gain was P0 0.905±0.1574, P1 1.013±0.11121 and P2 1.175±0.17078. Feed consumption was P0 21.214±8.14, P1 21.518±9.214 and P2 22.399±8.292. Consumption of concentrate P1 2.470±0.879 and P2 2.812±1.139. And the value of the *feed conversion ratio* P0 4.71, P1 4.20 and P2 3.81.

Temperature and humidity during the study ranged from 25.6 – 31.4°C and humidity 62 - 91%. Based on the results of the analysis, it can be concluded that the administration of *Azolla microphylla* in pellet form has no effect on the body weight of pre-weaned Nubian goats. However, based on research data, there was a tendency to increase body weight along with the increase in the quantity of *Azolla microphylla* given and an increase in the value of feed and concentrate consumption.

Keywords: Pellet, Azolla, Nubian, Body Weight Gain.

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Drying Characteristics of Crystalline Coconut Sugar with Rotary Rack Type Dryer

F. Lutfia, [1]* K. Syska, [1] and Ropiudin [2]

[1] Food Technology Study Program, Faculty of Science and Technology, University of Nahdlatul Ulama Purwokerto, Jl. Sultan Agung No. 42, Karangklesem, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 54231

[2] Agricultural Engineering Study Program, Dept of Agricultural Technology, Faculty of Agriculture, Jenderal Soedirman University, Jl. Dr. Soeparno No. 63, Karangwangkal, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 53122

**Corresponding author: fahlinlutfia@gmail.com*

Abstract

Drying is one of the critical points in making crystal coconut sugar. The production of crystal coconut sugar in Banyumas Regency is very potential to be developed, but the drying of crystal coconut sugar that has been carried out in Banyumas Regency still uses natural drying. The dryer used in this study is a rotary rack type dryer. This study aims to 1) examine changes in the moisture content of crystalline coconut sugar in a rotary rack-type dryer, 2) examine changes in the drying rate of crystalline coconut sugar in a rotary-rack-type dryer, and 3) examine the physical and chemical properties of crystalline coconut sugar dried using a rotary-type dryer. rotating rack.

The research was conducted at the Integrated Science Laboratory, University of Nahdlatul Ulama Purwokerto. The research was carried out from February to July 2022. The material used in this study was crystal coconut sugar obtained from crystal coconut sugar craftsmen in Banyumas Regency, Central Java. The materials used for analysis were Pb acetate solution, HCl, NaOH, Luff-Schoorl solution, KI, H_2SO_4, Na-thiosulfate solution, and aquades. The tools used in this study include a rotary rack type dryer. A number of other auxiliary equipment consists of digital scales, thermometers, stainless steel trays and stirrers. The tools used for analysis are pH meter, erlenmeyer, measuring cup, beaker, and pipette.

The experimental design was carried out on the parameters of water content, sucrose content, pH, and organoleptic tests. The data is then processed using Microsoft Excel data analysis to see the diversity that occurs in each observed drying factor and its interactions. The further test used is Duncan's follow-up test, this test is carried out if the treatment of temperature and drying time or the interaction between temperature and time has a significant effect on the observed quality parameters. The experimental design carried out in this study was a completely randomized factorial design with three replications for each treatment. The factors that were studied were A, drying temperature factors with A1, A2, A3 were 40, 60, and 80 ^{o}C, and B was drying time factors with B1 and B2, namely 1 hour and 2 hours.

The results of the analysis of changes in the water content of crystalline coconut sugar showed that the treatment for the difference in drying temperature was

significantly different at the 5% level on the decrease in the water content of crystalline coconut sugar. The higher the drying temperature, the faster the drying process. Based on the results of research Albar, *et al*. (2020), the higher the temperature of the drying air, the greater the heat energy carried by the air so that the greater the amount of water mass that is evaporated from the surface of the material.

The results of the analysis of the effect of drying rate on the characteristics of the material showed that the treatment differences in drying time were significantly different at the 5% level on the increase in the pH value of crystalline coconut sugar. The higher the drying temperature, the pH value will increase slightly, this is because the acid content in crystalline coconut sugar evaporates during the drying process. According to Kamil, *et al*. (2017), the longer the heating, the organic acids contained in crystalline coconut sugar such as ascorbic acid are damaged. The results of the organoleptic test analysis showed that the treatment differences in drying time were significantly different at the 5% level on the texture of crystalline coconut sugar. The higher the temperature and drying time, the higher the dry level of the crystalline coconut sugar texture. According to Dewi, *et al*. (2014), the longer drying time causes more water evaporation so that the water content in crystalline coconut sugar is getting smaller. The reduction of water molecules in the drying process also causes shrinkage of the material and an increase in the concentration of pectin, cellulose, and other materials that make up cell walls, thus the greater the concentration of pectin and the percentage of crystalline coconut sugar, the drier the texture formed.

Based on the results of the research on the drying characteristics of crystalline coconut sugar on the rotary rack type dryer, conclusions can be drawn: (1) Based on the research that has been done, the G3K2 sample (temperature 80 ^{o}C, time 2 hours) showed the best sample in chemical analysis including water content (3%, already in accordance with SNI), sucrose content (26.75%), and pH analysis (7.10). (2) The results of the physical analysis showed that G3K2 showed the best samples in the organoleptic test of color (3.72), taste (4.04), and texture (4.08).

Keywords: drying characteristics, crystalline coconut sugar, rotary rack type dryer, water content, organoleptic test

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Formulation and Characterization of Coffee and Crystalline Coconut Sugar for Product Diversification Based on Local Food

N. S. Istiqomah, [1]* K. Syska, [1] and Ropiudin [2]

[1] Food Technology Study Program, Faculty of Science and Technology, University of Nahdlatul Ulama Purwokerto, Jl. Sultan Agung No. 42, Karangklesem, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 54231

[2] Agricultural Engineering Study Program, Dept of Agricultural Technology, Faculty of Agriculture, Jenderal Soedirman University, Jl. Dr. Soeparno No. 63, Karangwangkal, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 53122

**Corresponding author: kholifatun645@gmail.com*

Abstract

Diversification of coffee products can be done by combining coffee with crystal coconut sugar which is expected to produce coffee products that are fresh, healthy and highly nutritious. This product is inspired by coffee drinks that are already circulating in the market. The development of this product is a new thing to research. For industrialization purposes as well as to increase durability, practical value and hygiene, it is necessary to formulate crystal coconut sugar coffee. Through this formulation, crystal coconut sugar coffee will be able to be produced with proportional raw materials, a series of standardized processes and produce products with good aroma and taste characteristics. Therefore, research on the formulation of this crystal coconut sugar coffee drink needs to be done in order to increase the added value of Robusta coffee. The formulation and characterization of crystal coconut sugar coffee drinks can be developed to diversify local food-based products from the archipelago. Thus, crystal coconut sugar coffee drinks will be produced to increase the added value of Indonesian coffee and crystal coconut sugar so as to increase the competitiveness of local food products. The research objectives of making this crystal coconut sugar coffee formulation are: (1) to examine the condition of the production process of the best crystal coconut sugar coffee drink based on physicochemical and organoleptic characteristics. (2) To study the formulation of crystalline coconut sugar coffee drink with physicochemical and organoleptic characteristics.

The research was conducted at the Integrated Science Laboratory, University of Nahdlatul Ulama Purwokerto. The research was carried out from January to June 2022. The materials used in the research were Robusta ground coffee, Crystal coconut sugar, mineral water, aquades, cotton, tissue. The tools used in the manufacture of crystal coconut sugar include: Digital Balance, Spoon, Measuring Cup, Bath, Thermometer, coffee cup and filter, equipment used in testing product characteristics, among others: pH-meter. The experiment was carried out with 2 kinds of treatment. The brewing temperature treatment was varied in the range of 60-70, 70-80, and 80-90. Meanwhile, the ratio of coffee weight: Crystal coconut sugar used included 10:0, 9:1, 8:2, and 7:3 (g/g). This study used a completely randomized design (factorial RAL with drying temperature (A) and a comparison of the composition of coconut sugar coffee (B). From these two factors, 12

combinations were obtained with 3 replications, so there were 36 experimental units. According to Mattjik and Sumertajaya (2013).

The results of the research on pH analysis, the best pH value is the highest pH level, namely in the formulation of coffee: crystal coconut sugar 7:3 with a temperature of 60-70℃, the less sugar used in the formulation of crystal coconut sugar coffee, the lower the resulting pH, The higher the concentration of sugar used in the coconut sugar coffee formulation, the higher the pH. The addition of crystalline coconut sugar to the coffee formulation has an effect on the higher pH of the formulation, this is because the higher the sugar content, the lower the activity of bacteria or starter. According to Gianti and Evanuarini (2011), if bacteria, yeasts and molds are placed in a concentrated sugar solution, the water in the cells will come out through the membrane and flow into the sugar solution, this is called osmosis and the microorganism cells undergo plasmolysis so that their proliferation is inhibited. The best yield results from the crystal coconut sugar formulation, namely the coconut sugar coffee formulation which has the least yield, namely the coffee: crystal coconut sugar formulation 8:2 with a temperature of 80-90℃. In the 8:2 formulation with a temperature of 80-90℃ the yield decreased by 1.375% from the weight of the formulation, the more addition of crystalline coconut sugar to the coffee-crystal coconut sugar formulation, the lower the yield. Instant coffee circulating in the Indonesian market is a type of Robusta which has a high extraction yield, but the higher the brewing temperature the lower the yield, this is because the higher the brewing temperature, the more the extraction process can be maximized so that more compounds are extracted in the brew, and the lower the chemical compounds in coffee grounds (Sutono, 2017). The results of the ANOVA test showed that the combination of the coffee-coconut sugar crystal formulation with variations in brewing temperature had a significant effect ($\alpha = 0.05$) on the taste of the organoleptic test. The most preferred taste of crystal coconut sugar coffee formulations are those that tend to be with the addition of crystal coconut sugar with a combination of coffee: crystal coconut sugar 7:3 with a brewing temperature of 80-90℃, and the coffee-coconut sugar formulation which has a low level of taste preference for coffee combinations. : coconut sugar crystal 10:0 with a brewing temperature of 60-70 , this is due to the addition of coconut sugar crystals helps to give a sweet taste to the coffee formulation of coconut sugar crystals.

The conclusions obtained in this study are: (1) the best pH in the crystal coconut sugar coffee formulation with a value of 5.89 with a formulation of 7:3 at a temperature of 60-70℃. (2) The best yield of crystal coconut sugar coffee formulation with a value of 7.89 g with a ratio of coffee: crystal coconut sugar 8:2 with a temperature of 80-90℃. (3) The organoleptic test on the coconut sugar crystal coffee formulation got the best values, including: color test with a value of 5, aroma test with a value of 5, and taste test with a value of 4.84.

Keywords: formulation, characterization, coffee, crystalline coconut sugar, food diversification

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Development of Specialty Coffee Based on Robusta Coffee with Innovation of Fermentation using *Saccharomyces cerevisiae* for Improving Coffee Quality

M. Maliah, [1]* K. Syska[1] and Ropiudin [2]

[1] Food Technology Study Program, Faculty of Science and Technology, University of Nahdlatul Ulama Purwokerto, Jl. Sultan Agung No. 42, Karangklesem, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 54231

[2] Agricultural Engineering Study Program, Dept of Agricultural Technology, Faculty of Agriculture, Jenderal Soedirman University, Jl. Dr. Soeparno No. 63, Karangwangkal, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 53122

**Corresponding author: maslakhatunmaliah@gmail.com*

Abstract

Coffee is one of the plantation commodities that has an important role in economic activities in Indonesia. Fermentation using Saccharomyces cerevisiae can be developed to produce fine robusta coffee by paying attention to the concentration of Saccharomyces cerevisiae and the fermentation time of coffee cherries to facilitate the exfoliation of mucus (Pratiwi, 2018) so that fine robusta coffee will be produced to improve the quality of competitive Indonesian coffee, especially Sunyalangu Coffee, Banyumas Regency, Central Java. The research objectives of developing robusta coffee-based specialty coffee with immersion and fermentation engineering are: (1) determining the best concentration of yeast starter to produce specialty coffee in the form of fine robusta coffee. (2) determine the best fermentation time to produce specialty coffee in the form of fine robusta coffee.

The research was carried out at the Integrated Science Laboratory, Nahdlatul Ulama University, Purwokerto. The research was carried out for 6 (six) months from February to July in 2022. The materials used in this study were starter Saccharomyces cerevisiae (2%; 3%; 4%), water, aquades, robusta coffee berries obtained from Sunyalangu Village, Karanglewas District, Banyumas Regency, Central Java. The tools used in this study were a jar, a roaster, a grinder, a digital scale, a rotary rack type dryer, a 1000 ml measuring cup, a 250 ml glass beaker, a 500 ml glass beaker, a thermometer, and a pH meter. This study used factorial RAL to see the effect of yeast concentration and fermentation time on pH and fermentation temperature, percentage of unpeeled beans, physical quality of rice coffee, density of kamba coffee rice, increase in roast volume, and quality of taste. This study used two factors, namely yeast concentration and fermentation time. Yeast concentration using Saccharomyces cerevisiae as the R factor covering three levels (2%; 3%; 4%). While the fermentation time with 3 levels, namely 8, 10, and 12 hours. The repetition was done three times. The observed research response variables consisted of water content, pH and temperature of fermentation, percentage of unpeeled beans, physical quality of rice coffee, density of kamba coffee rice, increased roasted volume, and organoleptic tests.

The results of the 5% ANOVA test analysis were found in the water content, the results showed that the concentration of yeast and the duration of fermentation had no significant effect on the water content. The water content is influenced by the temperature and time used during the drying process which causes evaporation so that the water content in coffee is lower. The drying process for each treatment was carried out using a rotary rack-type dryer with a temperature of 100oC and a time of 6 hours. The results of the 5% ANOVA test analysis were found at pH and temperature during fermentation. The results showed that the concentration of yeast and the duration of fermentation had a significant effect on the temperature after fermentation. The increase in temperature occurs due to the degradation process and exothermic reactions (Pratiwi, 2018). The increase in temperature continued to increase along with the increasing concentration of yeast and fermentation time used. Fermentation that occurs in this study is anaerobic, the temperature at the time of fermentation affects the growth of lactic acid bacteria, causing increasingly acidic conditions. The results of the 5% ANOVA test analysis were found in all parameters, the results showed that the concentration of yeast and the duration of soaking had a significant effect on the overall value of steeping coffee. Overall is the overall assessment of the panelists from several parameters that are assessed.

The results of research on the development of specialty robusta coffee with fermentation engineering using the yeast Saccharomyces cerevisiae to improve the quality of Indonesian coffee can be concluded: (1) the concentration of Saccharomyces cerevisiae (2%, 3%, 4%) and the duration of fermentation 8 hours, 10 hours, and 12. the best results in the R3F3 treatment (4% concentration and 12 hours fermentation time) this treatment can produce coffee with specialty/fine robusta flavor categories. (2) the concentration of saccharomyces cerevisiae significantly affected the pH and temperature after fermentation with a pH value of 4.53 and a temperature of 29.20. Meanwhile, the duration of fermentation significantly affected the percentage of unpeeled seeds with a value of 8.00. (3) the results of the organoleptic test treatment of the concentration of Saccharomyces cerevisiae and the duration of fermentation had a significant effect on steeping coffee. In the treatment of R3F3 (4% concentration and 12 hours of fermentation time) with an overall value of 2.73, the panelists liked it.

Keywords: specialty coffee, *Saccharomyces cerevisiae*, fine robusta coffee, fermentation, coffee quality

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Energy Audit on Ribbed Smoked Sheet (RSS) Rubber Processing at PT Perkebunan Nusantara IX (Persero) Krumput Garden, Banyumas Regency, Central Java, Indonesia

M. T. Rahmasari[1*], Ropiudin [1] and A. M. Ritonga[1]

[1] Agricultural Engineering Study Program, Dept of Agricultural Technology, Faculty of Agriculture, Jenderal Soedirman University, Jl. Dr. Soeparno No. 63, Karangwangkal, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 53122

Corresponding author: meinanda1999@gmail.com

Abstract

Rubber (Hevea brasiliensis Muell. Arg) is one of the main commodities in Indonesia for export and to meet domestic needs as a raw material for industrial needs. One type of processed rubber is Ribbed Smoked Sheet (RSS). As rubber production increases, the energy required on processing process will also increase. In order to utilize energy efficiently in Indonesia, especially for the rubber processing industry, an energy audit is required. The purpose of this study is to determine the energy needs of each unit of the Ribbed Smoked Sheet (RSS) rubber processing activity at PTPN IX Krumput, to determine the type of energy consumption in the Ribbed Smoked Sheet (RSS) rubber processing process at PTPN IX Krumput, and to identify the results of the energy audit and energy saving opportunities in the Ribbed Smoked Sheet (RSS) rubber processing process at PTPN IX Krumput. The materials used in the study were latex, antacid, water, firewood, laboor material, and packaging wood. Data retrieval out with 3 repetitions in the rubber processing process.

The method used in this study is an experimental method in the form of mathematical calculations in the ongoing rubber processing process, where the data obtained are analyzed descriptively to get picture of the energy use needed in the RSS processing so that energy saving efforts can be sought. Variables obtained from data collection include the amount of RSS production, human energy requirements, fuel energy requirements (wood), electrical energy requirements, and energy efficiency. The results showed that the total energy required for RSS rubber processing was 100543 MJ or 40.48 MJ/kg with details of fuel energy (wood) of 100152.00 MJ or 40.32 MJ/kg, electrical energy of 258.73 MJ or 0.10 MJ/kg and human energy of 132.99 MJ or 0.05 MJ/kg. Energy requirements in the Ribbed Smoked Sheet (RSS) rubber processing at PT Perkebunan Nusantara IX, Kebun Krumput consist of human energy, electrical energy, and fuel energy in the form of wood. Conclusions from the results of an energy audit on the rubber processing process of Ribbed Smoked Sheet (RSS) at PT Perkebunan Nusantara IX, Kebun Krumput showed that smoking is the stage that requires the most energy. Efforts to save fuel energy by maximizing the capacity of the smoke room to be filled with sheets and being disciplined when controlling room temperature so that the maturation process is on time.

Keywords: energy audit, ribbed smoked sheet, rubber processing, efficiency

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Development of Specialty Coffee Based on Robusta Coffee with Innovation of Fermentation Time using Lactate Acid Bacteria for Improving Coffee Quality

V. Arisna [1]*, K. Syska[1] and Ropiudin [2]

[1] Food Technology Study Program, Faculty of Science and Technology, University of Nahdlatul Ulama Purwokerto, Jl. Sultan Agung No. 42, Karangklesem, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 54231

[2] Agricultural Engineering Study Program, Dept of Agricultural Technology, Faculty of Agriculture, Jenderal Soedirman University, Jl. Dr. Soeparno No. 63, Karangwangkal, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 53122

Corresponding author: vikiarisna@gmail.com

Abstract

Coffee is one of the plantation commodities that has a fairly high economic value among other plantation crops, and plays an important role as a people's producer, export commodity, and foreign exchange income. The fermentation process can be carried out to remove the mucilage that is still attached to the beans and help improve the taste of brewed coffee by producing microbial metabolites, which are precursors of volatile compounds formed during roasting. Microorganisms that play a role in fermentation are yeast, bacteria, and fungi that produce lactic acid (Mussatto et al. 2011; Pereira et al. 2014). The fermentation process is carried out using Lactobacillus casei, Lactobacillus bulgaricus, and Streptococcus thermophillus bacteria to produce fine robusta coffee in order to improve the competitive quality of the archipelago, especially Robusta Coffee, Banyumas Regency, Central Java. The research objectives regarding the development of specialty coffee based on robusta coffee with fermentation time are: (1) to determine the best combination of bacterial concentration and fermentation time to produce specialty coffee in the form of fine robusta coffee. (2) determine the effect of combination treatment of bacterial concentration and fermentation time on specialty coffee in the form of fine robusta coffee.

The research was conducted at the Integrated Science Laboratory, Nahdlatul Ulama University, Purwokerto. The research was carried out for 6 (months) months from February-July 2022. The materials used in this study were starter Lactobacillus casei, Lactobacillus bulgaricus, and Streptococcus thermophillus, water, aquades, robusta coffee berries obtained from Sunyalangu Village, Karanglewas District, Kabupeten Banyumas, Central Java. The tools used in this research are plastic jars, rotary rack type dryer, roaster machine, grinder machine (roasted coffee grinder), digital scale, thermometer, and digital pH. The study was conducted using two factors, namely the concentration of bacteria as factor K and fermentation time as factor F. The bacteria used were Lactobacillus casei, Lactobacillus bulgaricus, and Streptococcus thermophillus which included three levels (32.50 ml/l water, 65.00 ml/ l water, and 97.50 ml/l water) while the fermentation time used consisted of three levels, namely 6, 8, and 10 hours. The repetition was carried out three times and in this study used Factorial RAL to see the effect of the concentration of

bacteria and fermentation time on water content, pH and temperature during fermentation, percentage of unpeeled beans, physical quality of rice coffee, density of rice coffee kamba, increase in roasted volume, and taste.

The results of the 5% ANOVA test analysis on the water content showed that the concentration of bacteria and the duration of fermentation had no significant effect on the water content. The water content is influenced by the temperature and time used during drying which causes evaporation so that the water content in the material is lower. Drying for each treatment was carried out using a rotary rack-type dryer with a temperature of 80 oC for 6 hours. Based on the results of the 5% ANOVA test analysis at pH and temperature, the fermentation time significantly affected the temperature after fermentation. The increase in temperature occurs due to the degradation process and exothermic reaction (Velmourougane 2013). K3F3 is the treatment with the highest temperature, the temperature increase continues to increase along with the longer time used in fermentation. The temperature at the time of fermentation affects the growth of lactic acid bacteria, causing more acidic conditions. Based on the results of the 5% ANOVA test analysis on the percentage of unpeeled seeds, bacterial concentration and fermentation time did not significantly affect the percentage of unpeeled beans. The percentage of unpeeled seeds is influenced by soaking for 24 hours before fermentation, at the immersion stage an imbibition process occurs which causes water absorption in the cell walls. During the imbibition process, the beans expand rapidly to double their actual size and the skin that covers the beans becomes softer which makes pulping easier for the coffee cherries. Based on the results of the 5% ANOVA test analysis on the Physical Quality of Rice Coffee, bacterial concentration and duration of fermentation had no significant effect on the value of the physical quality of rice coffee. The quality rating of specialty robusta coffee is determined based on the findings of the type and number of defective beans. K1F3 has the highest average defect value, which is 4.67, this value meets the requirements of SNI number 01-2907-2008 that the maximum defect value for the physical quality of rice coffee is 5. The presence of defective beans in rice coffee is caused by pests and diseases that cause hollow beans/black beans and taking coffee cherries that have fallen to the ground so that the beans are broken. In this study, no dirt, live insects, foul-smelling seeds, and mold were found because selective sorting and washing were carried out. Based on the analysis of the 5% ANOVA test on taste quality, bacterial concentration and fermentation time, there was a significant effect on the overall value of steeping coffee. The panelists' assessment showed that the total concentration of bacteria and the duration of fermentation would affect the panelists' preference for the overall value of brewing coffee, K2F2 got a high overall value. This happened because the treatment had a distinctive aroma of steeping coffee, sour and slightly bitter flavor, thick mouthfeel, and had acidity with a pH that was up to standard.

Based on research on the development of specialty coffee based on robusta coffee with long fermentation engineering using lactic acid bacteria to improve the quality of Indonesian coffee, conclusions can be drawn: (1) the best treatment based on chemical analysis is K3F2 (bacteria concentration 97.50 ml/l water and fermentation time 8 hours) with a value of 4.20 and based on the organoleptic test, namely K2F2 (concentration 65.00 ml/l water and fermentation time 8 hours) with a value of 4.00. (2) based on

organoleptic test, bacterial concentration of 65.00 ml/l of water and 8 hours of fermentation had a significant effect on pH and temperature after fermentation. (3) the concentration of bacteria and fermentation time did not significantly affect the moisture content, the percentage of unpeeled beans, the physical quality of the rice coffee, the density of the rice coffee kamba and the roasted coffee kamba density, the increase in the volume of roasted coffee beans.

Keywords: specialty coffee, lactate acic bacteria, fine robusta coffee, fermentation time, coffee quality

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Temperature and Drying Time Effect on Biopellet Characteristics from Coffee Bean Skin and Sengon Wood Carbonization

Y. Aditya [1]*, Ropiudin [1] and A. M. Ritonga [1]
[1] Agricultural Engineering Study Program, Dept of Agricultural Technology, Faculty of Agriculture, Jenderal Soedirman University, Jl. Dr. Soeparno No. 63, Karangwangkal, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 53122

**Corresponding author: yoga.adity16@gmail.com*

Abstract

Energy is the main commodity for daily life in society. The energy produced generally comes from fossil fuels which have a limited amount and cannot be renewed. It takes alternative energy that is environmentally friendly, renewable, and has a price that can be reached by all levels of society. Biomass has the potential to be an alternative energy source because it has an abundant amount. The direct use of biomass waste as energy is still less effective. This is due to the fact that biomass has a variety of forms, making it difficult to distribute and has an unstable heating value. The physical properties of biomass can be improved by compressing the waste biomass into biopellets. Making biopellets has several stages, one of which is drying. Drying is an important step in the manufacture of biopellets which will affect the characteristics of the biopellet. However, there are still few studies that combine the effect of temperature and drying time on the quality of biopellets.

Therefore, this study aims to determine the effect of temperature and drying time on the characteristics of biopellets including testing water content, ash content, volatile matter content, density, burning mass rate, and shatter index. The main ingredients used in this research are coffee husk and sengon wood powder which has been carbonized and tapioca adhesive. Meanwhile, the main tools used include a biopellet printer, a furnace, a scale drying oven and a stove. This study used a completely randomized design (CRD) with a factorial pattern. The drying temperature factor consists of 3 levels, namely 55°C, 100°C, 125°C and the drying time factor consists of 3 levels, namely 1 hour, 2 hours, and 3 hours. The stages of the research carried out included the preparation of raw materials, carbonization process of coffee husk and sengon wood powder, grinding of coffee husk charcoal and sengon wood powder, sifting of coffee husk charcoal and sengon wood powder, making adhesives, mixing raw materials with adhesives, printing biopellets, drying. biopellet, biopellet testing, and the last step is the analysis of the test data.

The test results show that the higher the temperature and the longer drying time used, the lower the moisture content, shatter index, and mass rate of combustion, but the value of ash content and density will increase. The characteristics of the biopellets produced from the research have a water content ranging from 3.00-50.33%ww, ash content 3.67-9.33%, volatile matter content of 88.10-92.06%, density 0.365-0.858 g/ cm^3, the mass rate of combustion is 0.0934-0.1434 g/minute, and the shatter index is 23.73-45.32%. The drying temperature treatment had a very significant effect on all the

characteristics of the tested biopellets including moisture content, ash content, volatile matter content, density, combustion rate, and shatter index. Treatment of long drying time has a very significant effect on the characteristics of biopellets including moisture content, ash content, density, combustion rate, and shatter index. Meanwhile, the characteristics of volatile matter content did not have a significant effect. The most optimal use of temperature and length of time for water content characteristics is at a temperature of 125°C with a drying time of 3 hours (T3L3). The characteristics of ash content, volatile matter, and density were optimal at 55°C with a drying time of 1 hour (T1L1). Meanwhile, for the characteristics of the mass rate of combustion and the most optimal shatter index is at a temperature of 100°C with a drying time of 2 hours (T2L2).

Keywords: biopellet, carbonization, drying, coffee skin, sengon wood

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Effect of Calcium Chloride on Quick-Cooking Hom Kradang-Nga (*Oryza sativa* L.) Brown Rice

R. Toae[1]*, S. Mideng[1], M. Ruchirasak[1], S. Aunkaew[1], and J. Pecharapanta[3]
[1] Faculty of Agriculture, Princess of Naradhiwas University, Narathiwat 96000, Thailand.

**Corresponding author: roselawatee.t@pnu.ac.th*

Abstract

In recent years, consumers have preferred to eat ready-to- eat food over homemade food. Especially, rice which has been used for a long time for cooking. Quick-cooking rice (QCR) is the best choice for them using 5-10 min for recook. The QCR preparation is initiation by soaking, cooking and follow by drying. The concentration of the saturated solution at soaking step is one of the factors of QCR preparation. The study aims to evaluate the properties of quick-cooking Hom kradang-nga brown rice (QC-HBR) using different calcium chloride ($CaCl_2$) concentrations. Hom kradang-nga rice (*Oryza sativa* L.) is a local rice of Tak Bai District, Narathiwat Province, Thailand. The color of brown rice is reddish-brown with an elongated oval shape. The proportion of cooking with water is 1:1.5. The cooked brown rice is crumbly but not hard and has a scent resembling the Hom kradang-nga flower (*Cananga odorata* Lam.). The elongation of cooked rice is 1.70 times when compared with regular rice, with a medium gelatinization temperature (70-74 °C) and a cooking time is 16-24 min. The amylose content is medium about 22.7% and contain protein, lipid, carbohydrate, fiber, and ash about 8.96, 2.42, 71.40, 1.52 and 0.87%, respectively.

Preparing QC-HBR was followed by weighing 100 g native Hom karadang-nga brown rice (N-HBR) and soaked in 100 ml of 0, 1 and 3 % (w/v) calcium chloride solution at room temperature for 1 and 3 h and washed with water two times. After cooking with an electric cooker with 150 ml H_2O, they were soaked in cold water (4 °C) for 2 min and drained the water out to spread for 5 min. The cooked N-HBR dried in hot air oven at 90 °C for 3 h until moisture content (MC) was 10-12% for QCR. The MC and optimum cooking time (OCT) were evaluated. The QC-HBR (5 g) were boiled in 50 ml H_2O at 98±1 °C for 2 min to analyze OCT as the time that the dry central core of QC-HBR grains disappear (completely gelatinization) when they were squeezed between two glass plates. We found that the MC between 5.70-8.61%. The OCT of samples was between 12-14 min that less than 24 min for regular cooking of N-HBR. Especially, for soaking with the concentration of $NaCl_2$ solution is 3% (w/v) for 1 h and dried for 3 h shown the OCT about 11.65 min. Concentration and soaking time of $CaCl_2$ solution are affected of QC-HBR preparation.

Keywords: brown rice, quick cooking rice, calcium chloride

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Identifying feasibility of Giant Freshwater Prawn (Macrobrachium rosenbergii) and Red Tilapia (Oreochromis niloticus-mossambicus) Polyculture Integrated with Vegetables in Recirculating System

N. Chealoh*, L. Buerahang and M. Buerahang
Faculty of Agriculture, Princess of Naradhiwas University, Mueang Narathiwat District, Narathiwat, 96000, Thailand

Corresponding author: nifareesa.c@pnu.ac.th

Abstract

Monoculture is the most practiced aquatic production system. This varies according to the organism, but typically most culture is stocked in high densities to obtain high productivity. In this culture system, only ~20% of the nutrients (C, N and P) supplied by the diet is consumed by the target species while the other of nutrients become solid waste. Polyculture system is culturing of different species in the same pond. The system allows a more efficient exploitation of nutrients and produces less waste, also integrated aquaculture systems are a strategy to improve environmental sustainability. In this study, the growth of giant freshwater prawn and red tilapia cultivated together with vegetable in circulating water system, using a total of 200 aquatic animals, divided into 70 giant freshwater prawn (7.50±1.27 g) and 130 red tilapia (3.45±0.26 g) in PE tank size about 1*2*0.6 m. Prawn and red tilapia were fed commercial diet with feeding 5% of body weight twice daily, for 7 weeks. growth rate, as well as weekly data on the water quality and the amount of water discharged. During the second week of the trial, new cropping systems are introduced.

Water quality was analyzed throughout the experiment, observed that temperature and dissolved oxygen were optimum water quality with suitable for aquatic animal life (the value in the range of 27-30 °C and 4.5-7.5 mg/L). Concentration of ammonia and nitrite were in the range of 0.5-1 mgN/L and 1-3 mg/L, during the second week and decreased after the cropping was introduced into systems (the value in the range of 0-0.25 mgN/L and 0.1-0.25 mg/L throughout the experiment). The specific growth rates of giant freshwater prawn and red tilapia were 0.28 and 0.26 g respectively. The average weight of giant freshwater prawn and red tilapia were increased by 6.31±0.66 g and 12.90±1.65 g respectively. The end of the experiment, the giant freshwater prawn and red tilapia survived in the range of 62.9 and 82.4 %, respectively. Feed conversion ratio (FCR) of giant freshwater prawn and red tilapia were in the range of 2.55 and 2.67, respectively. In conclusion, the giant freshwater prawn and red tilapia could be cultured together. The integrated culture may increase the efficiency of the system, red tilapia swim actively in the water column, whereas prawns eat tilapia feces and leftover diet. Meanwhile, cropping-integrated was consistently removing ammonia and control the concentration of inorganic compounds.

Keywords: Giant freshwater prawn, red tilapia, vegetable, circulation system

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Effect of Crowding Stress condition on Survival Rate and Growth Performance in Red Tilapia transportation

Chealoh, N. *, Yapa, P., Yamplee, A., Pi, F., and Yeeraseh, K.
Faculty of Agriculture, Princess of Naradhiwas University, Mueang Narathiwat District, Narathiwat, 96000, Thailand

*Corresponding author: nifareesa.c@pnu.ac.th

Abstract

The density of fish during transportation significantly affects water quality. Life fish transportation often uses crowded condition and long duration, which generally results in high mortality rates but it is different among species. This is due to a stressful situation during transportation. Aquatic animals respond to stress throughout physiological changes such as changes in osmolarity, metabolism of energy, hematology, and hormone releasing to reach homeostasis. All self-regulating process are critical their health status and affect to their growth performance. This study was carried out to evaluate the survival rate and growth performance of red tilapia rearing in same condition after transport under different fish densities in closed containers. In this study, red tilapia fingerlings (2-3 g) were randomly packet into sealed plastic bags for 24 h (stressful situations) at two densities, consisting of 10 and 30 fish per liter water (normal and crowding). The temperature was controlled at same condition and adjusted about 27¡C. After transported, all alive fish were acclimated and reared in PE tank, each density with 3 replications were separated by rearing in individual cage.

Red tilapia was fed commercial diet containing 32% crude protein with feeding 5% of body weight twice daily, for 6 weeks. The basic water parameters were frequently sampled and recorded once a week throughout the experiment. The result of this study presented the survival rate of red tilapia from two density transport conditions were 100% after transportation. However, water quality in transported bag showed variation such as Alkalinity and ammonia concentration were significantly different ($P<0.05$) between normal and crowding. After rearing the fish is consistently monitored for water parameter and maintaining optimum water quality (including of temperature, pH, DO, ammonia, nitrite, and nitrate) for 6 weeks. The results showed that survival rate was higher in normal when compared to crowd density (93.96±0.24% and 72.84±1.17%). feed conversion ratio (FCR) observed 1.00±0.33 in normal and 1.61±0.13 in crowd density with significantly different ($P<0.05$). In the same way, specific growth rate (SGR) revealed highest in normal density when compared to crowd density (0.030 and 0.012 respectively). It could be concluded that stress condition in red tilapia could be induced by high fish density during life fish transportation. Also, high fish density transportation significantly affected to red tilapia growing and long-term survival which was inversely related to transporting and stocking fish density. Over crowd density during transportation condition leads to significant fish production losses, considerably decreased survival rate and growth performance of red tilapia.

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Keywords: Red tilapia, Crowding, Stress, transportation

Analysis of Procurement and Demand Raw Material and Added Value of Dried Fish Making Business in Bengkulu City

Nabilasari, M[1]*, B. Sumantri[1], and Sriyoto, S[1]
Department of Agricultural Socio-Economics, Agribusiness Study Program, Faculty of Agriculture, Bengkulu University

*Corresponding author: melysanabilasari5500gmail.com

Abstract

The dried fish-making business is one of the household businesses based on processing marine fishery products which is held traditionally and simply with the help of sunlight. In carrying out their business, at certain times, not a few dried fish makers experience problems in fulfilling raw materials in the form of fresh fish, considering that fishery products are seasonal agricultural products and are easily damaged. This study is intended to: (1) Analyze the source and the number of fresh fish used in the business of making dried fish in Bengkulu City, (2) Analyze the factors that affect the quantity of demand for fresh fish in the business of making dried fish in Bengkulu City and (3) Analyze the added value from the business of making dried fish in Bengkulu City. This research was conducted from January to February 2022 in Kampung Melayu District, Sumber Jaya Village, Bengkulu City. Sumber Jaya Village was chosen purposively with the consideration that this area is a dried fish production center in Bengkulu City based on the results of the initial survey of the study. The sample of this study was 86 people who were selected using the census method where all population was sampled. The data used are primary and secondary data, and the data analysis used is qualitative and quantitative analysis. Sources of fresh fish raw materials used in the manufacture of dried fish are divided into three, namely self-catch, buying, and self-catch and buying. The largest percentage of sources of raw material is by buying (88%), where the place to get the most comes from fishermen directly. The raw materials used were 10.563 Kg per production process, which is dominated by the type of *beledang* fish. The factors that partially affect the quantity of demand for fresh fish by dried fish makers are the price of ice and dummy of scale business. This variable has an effect on the 95% confidence level. Meanwhile, the price of dried fish and the price of fresh fish has no effect. The process of making fresh fish into dried fish in Bengkulu City is able to create added value for each type of fish used because it has an NT value > 0 (positive), the amount of added value is Rp. 5.799,32 per kg of raw material (*beleberan*), Rp. 4.223,61 per kg of raw materials (*kase*), Rp. 5.161,32 per kg of raw material (*beledang*), Rp. 7.556,13 per kg of raw material (*kerong*), and Rp. 9.592,77 per kg of raw material (*pala batu*). Suggestions that can be given are (1) in the procurement of raw materials, dried fish makers should be able to utilize many existing sources of raw materials in order to maintain production continuity, (2) recommended type of fish to be processed into dried fish in the business of making dried fish in Bengkulu City is *pala batu* fish, considering that this fish has a greater added value than the types of *beleberan*, *kase*, *beledang*, and *kerong* fish.

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Keywords: Dried Fish, Procurement, Demand, Raw Material, Added Value

Identification of Seed-Borne Fungi from Several Lowland Rice Strains of Assembly Result of University of Bengkulu

A. Rahmi, A, * T. Pamekas, and N. Zahara
Department of Plant Protection, Faculty of Agriculture, University of Bengkulu

**Corresponding author: rahmiairin26@gmail.com*

Abstract

One of the efforts to overcome the paddy field deficit is by utilizing the swampy land which is still available. In this case, swamp rice or lowland rice seeds health is one of the things that should be evaluated, especially in developing new varieties. One of the pathogens that usually infect rice seeds is fungi. This research aimed to identify the seed-borne fungi that infected or contaminated the seeds of several lowland rice strains developed by University of Bengkulu. The research was done by using three kinds of methods including the grinding method that involved MgSO4 to “wash” away the fungi outside the grains that bare eyes could not see, the platting of seeds method or blotter test method where the seeds were planted on blotting paper for approximately seven days to see the fungi that might already infecting inside and couldn’t be found outside the seeds, and the seedling symptom test method where the seeds were planted on river sand as the media for approximately a month (30 days) to see if there’s any disease symptom that phytopathogenic fungi might cause. This research was held from September to November 2021 in Laboratory of Plant Protection, the samples used in this research were 10 strains of lowland rice including UBPR 1, UBPR 2, UBPR 3, UBPR 4, UBPR 6, UBPR 7, UBPR 8, UBPR 9, UBPR 10, and UBPR 11 that were obtained from Department of Agricultural Cultivation University of Bengkulu, also 1 rice variety INPARI 32 obtained from BPTP Bengkulu as the comparison. UBPR stands for ”Universitas Bengkulu Padi Rawa“ or ”University of Bengkulu Lowland Rice“.

The result showed that 8 species of seed-borne fungi obtained from three methods were Aspergillus flavus, A. niger, Trichoderma sp., Penicillium sp., Fusarium sp., Pyricularia oryzae, Mucor sp., and Rhizopus sp. From the grinding method, three species of fungi obtained, including A. flavus, A. niger, and Trichoderma sp. From the platting of seeds of blotter test method, three species of fungi were obtained, including A. flavus, A, niger, and Penicillium sp. From the seedling symptom test, there were six species in total of fungi obtained, including Fusarium sp., P. oryzae, A. flavus, Mucor sp., Rhizopus sp., and Penicillium sp. Based on the number of fungi successfully identified, the seedling symptom test was the method that could detect more species of seed-borne fungi from the several lowland rice strains that were used than the other two methods.

Keywords: Identification, Seed Borne, Fungi, Lowland Rice, Bengkulu

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The Effect of Paclobutrazol Concentration on Floral Initiation of Garden Balsam (*Impatiens balsamina* L.) to Improve as Potted Plant

N. Chedao,[1] C. Cheha, [1] A. Madeng, [1] and A. Waelaning[1]
Plant Science Program, Faculty of Agriculture, Princess of Naradhiwas University, Narathiwat, Thailand

**Corresponding author: nusanisa.c@pnu.ac.th*

Abstract

The improvement of a potted plant in the control of canopy size and flowering period of garden balsam was studied by direct application of paclobutrazol, an inhibitor of gibberellin synthesis or action, can significantly retard plant growth and accelerate flowering at doses in several woody, perennial and annual plants, at Faculty of Naradhiwas University, Narathiwat Province, Thailand. Paclobutrazol is a well-known plant growth retardant. It has long been used to reduce plant height for potted plant production, particularly ornamental plants. Garden Balsam or rose balsam (*Impatiens balsamina* L.) belongs to the family Balsaminaceae. It is an annual plant growing up to 60-75 cm in height, with a thick but soft stem. The seedlings were individually potted in 10 inches plastic pots filled with growing media. The experiment was on Completely Randomized Design (CRD) with four treatments. The application of paclobutrazol concentration levels used were control, paclobutrazol at 100, 200 and 300 ppm). Each treatment was replicated five times.

The paclobutrazol was applied by drenched at 21 days after planting after pinched at fourth leaf pairs for 3 days. The results showed that the application of paclobutrazol markedly delayed floral initiation. The maximum days taken to the first flower opening (59.80±0.36 days) were observed from the control (0 ppm of paclobutrazol). The maximum number of flowers (36.04±0.32) were drenched with 300 ppm of paclobutrazol. However, for getting the minimum number of flower diameter and the first flower opening (2.18±0.14 and 57.20±0.34, respectively) were recorded from the plants drenched with paclobutrazol at 300 ppm. Thus, the plant applied with pinching and paclobutrazol at 300 ppm had dense flowers at the top, but the size of the flowers was small. On the other hand, the plants had shorter nodes of stem compared to other applications of paclobutrazol and control.

Keywords: Impatiens balsam, paclobutrazol, flower initiation, pinched,

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Adaptation of Vegetable Farmers in Nusa Indah Sub-District Ratu Agung To Climate Change

D. Arborea, A[1], N. Arianti, N. N
Department of Socio-Economic of Agriculture, Faculty of Agriculture, University of Bengkulu

**Corresponding author: alviradewi2@gmail.com*

ABSTRACT

Agriculture is a sector that is very vulnerable to the impact of climate change because the farming industry relies on the water and weather cycle to maintain its productivity. Therefore, the existence of climate change, such as high rainfall, will have an impact on crop productivity, including vegetable crops. In addition, vegetable farming is one of the livelihoods people rely on to earn income to meet their daily needs. Therefore, vegetable farmers indeed seek high productivity. However, erratic climate change impacts vegetable farming, especially on production results. Nusa Indah Village is one of the villages in Ratu Agung District that develops vegetable farming. This village is located at the edge of an empty river into the sea. The impact of climate change will harm farmers' agriculture. Adaptation actions to the effects of climate change need to reduce the perceived negative impacts.

Nationally, the Ministry of Agriculture of the Republic has made adaptation efforts, including adjustments in the farming system. The farming system's adjustment includes planting time, site selection, variety selection, use of screen houses, plastic houses, and development of irrigation technology, as well as capacity building of farmers and extension workers through climate schools. This study aims to analyze the impact of climate change felt by farmers in Nusa Indah Village and the actions of farmers to adapt to the effects of climate change. The research was conducted in October 2021 in the Nusa Indah Village, Ratu Agung District, Bengkulu City. Research respondents were farmers of kale, spinach, and mustard greens which took in a census of 15 people. The data used are primary and secondary, and the data analysis used is quantitative descriptive. The results showed that all vegetable farmers (100%) in the village of Nusa Indah felt the harmful impact of climate change.

The effects felt are flooding or inundated land (80%), crop failure (54%), and a decrease in the quantity and quality of vegetable production (40%). These problems are generally caused by the intrusion of seawater through rivers into the land. Vegetable farmers in the village of Nusa Indah have taken several adaptation actions to the adverse effects of climate change. As many as 80% of farmers adapt in various ways to reduce the impact of climate change experienced, while 20% do not take adaptation actions. Adaptation actions taken by vegetable farmers in Nusa Indah Village are delaying planting time (80%), doing early harvesting (47%), and spreading NPK fertilizer on the land (27%). Other adaptation actions that should also do carry out by farmers, such as changing plant types, planting time, and cropping patterns, improving irrigation and drainage techniques, and changing pest control techniques, are not carried out by farmers. At least the actions

taken by farmers are closely related to the ability of farmers to implement them. On average, the land area of vegetable farmers in Nusa Indah Village is only 0.06 ha. Farmers have little capital, so, naturally, adaptation actions taken by farmers are also few. The steps taken to adjust to the abilities and knowledge and skills possessed by farmers.

Keywords: Climate Change, Adaptation, Vegetable Farmer

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Consumer Perception Analysis of Marketing Mix of "Rujak Buah Ulek" at Istana's Fruit Salad

D. Aryani,[1] A. Nyayu, N,[2] and P. Basuki, S [3]
[1] W.R. Supratman Street, Kandang Limun, Bengkulu - 38371, Indonesia

**Corresponding author: desiaryani2000@gmail.com*

Abstract

Fruits are agricultural commodities that have a role in food diversity. Rujak buah ulek is one of many variations of processed fresh fruits. This study aims to analyze consumer perceptions of the marketing mix of rujak buah ulek at Istana's fruit salad and the relationship between consumer perceptions of the marketing mix with purchasing decisions. The method to determine the number of respondents in this study is the accidental sampling method. Respondents in this study amounted to 96 people. to analyze consumer perceptions of the marketing mix used descriptive analysis. The correlation between consumer perceptions of the marketing mix with purchase decision process is analyzed by the Spearman.

The results of the analysis show that consumer perceptions of all components of the marketing mix of product, price, promotion and place at Istana's fruit salad are in the good category. That means strategy the product marketing mix applied was appropriate and according to consumer wishes. Consumer perceptions of products are assessed from several indicators such as fruit type, size of fruit pieces, color of spices, flavor of spices, packaging and other. Consumer perceptions of prices are assessed from several indicators such as price suitability with quality and benefits, price competitiveness, and price affordability. Consumer perceptions of promotions are assessed from several things, such as the use of social media, collaboration with online motorcycle taxis, and others. Consumer perceptions of the place are assessed from several indicators such as location access, cleanliness, layout, supporting facilities, and others.

process of making a purchase decision for Rujak buah ulek needs to do the five stages of the decision-making process there are identifying needs, information seeking behavior, evaluation of alternatives, purchasing decisions, and post-purchase evaluation. Based on the calculation of the relationship between consumer perceptions of the marketing mix with Purchasing decisions using Spearman's Rank analysis are known to value significance is 0.000 or smaller than alpha = 0.05, then Ho is rejected and H1 is accepted, meaning that there is significant relationship between perceptions of the marketing mix with decisions making process. The value of the correlation coefficient between the product and the purchase decision is good and correlation coefficient positive (+), meaning that the relationship is said to be in the same direction means that if the perception of the product is good, then decision making the decision is getting easier, in other words to buy good rujak buah ulek doesn't need to be taken seriously.

The correlation coefficient value for the Istana fruit salad is 0.814, meaning that the level of the strength of the relationship between perceptions of prices is very strong. The correlation coefficient is positive (+) or said to be unidirectional. The value of the

correlation coefficient between promotions and purchasing decisions rujak ulek is 0.682 which means that the level of strength of the relationship between perception of promotion and decision purchase is strong. The correlation coefficient is positive (+), meaning that the relationship said to be unidirectional which means that if the perception of promotion is good, then the decision to buy rujak buah ulek is also done easily. The value of the correlation coefficient between the place and the decision to buy rujak buah ulek is 0.809 which means the level of strength of the relationship between the perception of the place in is very strong. The conclusion there is a significant relationship with a positive direction between consumer perceptions of the marketing mix and purchasing decisions at Istana's fruit salad that is price and place have a very strong relationship level, while products and promotions have a strong relationship level.

Keywords: Rujak Buah Ulek, Consumer Perception, Marketing Mix

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The Effectiveness of The Role of Farmers' Group on The Performance Of Rice Farming In Kemumu Village, Arma Jaya District, North Bengkulu Regency

P. Arma [1]*, Asriani. P. S.[1], and M. Nabiu[1]
Agribusiness Study Program, Agricultural Socio-Economic Department, Faculty of Agriculture, Bengkulu University

*Corresponding author: armaputra06@gmail.com

Abstract

Farmer groups are institutions that have an important role in agricultural activities. Based on Permentan number 67 of 2016, farmer groups have a role as learning classes, cooperation vehicles and production units, where this role is needed by farmers in carrying out their farming activities. However, in its implementation, there are still some problems faced, such as there are farmer groups that rarely carry out farming and carry out farming activities together so that farmers as members of the farmer group do not get and feel the role of the farmer group. Therefore, efforts are needed to see the role of farmer groups. The purpose of the study is to determine the effectiveness of the role of farmer groups, process innovation, rice farming business performance, and the effectiveness of the role of farmer groups on rice farming business performance. and the effect of the effectiveness of the role of farmer groups on the performance of rice farming through process innovation. This research was conducted in Kemumu Village, Arma Jaya District, North Bengkulu Regency during February 2022.

The area was chosen with the consideration that Kemumu Village has the largest number of farmer groups in North Bengkulu Regency and has good rice potential. The sample determination method used was simple random sampling and obtained the results of 120 respondents. The data used are secondary data and primary data. The data analysis used is qualitative and quantitative analysis with structural equation modeling (SEM) analysis tools with PLS. The results showed that farmer groups in Kemumu Village have carried out their roles effectively. The results of process innovation in a high category that states that farmers have implemented process innovation well. The performance of farming is in the high category, where the high performance describes the ability of farmers to run their farming business.

The results of the analysis of the effect of the effectiveness of the role of farmer groups on the performance of rice farming that has been carried out state that simultaneously the effectiveness of the role of farmer groups has a negative and insignificant effect on the performance of rice farming businesses. Meanwhile, indirect influence states that the effectiveness of the role of farmer groups has a positive and significant effect on the performance of rice farming through process innovation. The result of the comparison between the direct and indirect influences between these variables states that the indirect influence is greater than the direct influence, it states that process innovation is a mediation that helps improve the performance of rice farming

and has a greater contribution than the direct influence between the effectiveness of the role of farmer groups and the performance of rice farming. Thus, the results state that in an effort to improve the performance of rice farming, it is necessary to increase process innovation. The process innovation that most affects the performance of farming is that farmers can apply process innovations as a result of the implementation of the role of farmer groups in the form of how to apply pesticides in a timely manner. Therefore, farmer groups must always encourage farmers in terms of accepting and implementing process innovations in farming activities because the results of research show that the effectiveness of the role of farmer groups does not affect the performance of farming, but becomes influential when there is mediation by process innovation.

Keyword: Effectiveness, process innovation, performance, mediation, SEM-PLS

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Adaptation of 5 Varieties of Shallots in Fields Exposed to Leaf Blight and Bulb Rot in the Lowlands

P. Dimas [1*], Alnopri [1], B. Hendri [1]
[1]Department of Agroecotechnology, Faculty of Agriculture, University of Bengkulu
[2]Department of Plant Protection, Faculty of Agriculture, University of Bengkulu

**Corresponding author : E-mail dpangestu2000@gmail.com*

Abstract

Shallots are an economic commodity with an increasing demand yearly, so production must increase. One way to increase production is to develop several varieties of shallots that are suitable for the local environment and have high yield potential. The lowlands of Bengkulu city are potential areas for the development of shallots. But leaf blight and bulb rot causes of the decline in shallot production. However, which varieties produce high yields and are resistant to late blight and bulb rot is not yet known. The materials used are seeds of 5 varieties of shallots, cow manure, lime, Urea, KCL, and SP-36 fertilizers. This research was conducted in April - June 2022 in an integrated agricultural area, Kandang Limun Village, Muara Bangkahulu District, Bengkulu City with an altitude of 10 m above sea level. This study aims to obtain shallot varieties suitable for planting in the lowland environmental conditions of Bengkulu city, to measure the level of attack of leaf blight and bulb rot, and obtain varieties that are resistant to late blight and bulb rot in the lowlands. This study was arranged using a randomized block design with a single factor consisting of 5 varieties of shallots, namely Batu ijo, Sembrani Jogja, Solok, Peking Putih, and Bima Brebes, which were repeated 4 times. The replication unit consisted of 1 plot of shallots measuring 1x0,8 m2. Lowlands infected by bulb rot and leaf blight pathogens is cultivated into beds 1x0.8x0.3m3 and added with a dose of cow manure 2kg.m2^{-1} and lime 500g.m2. doses, and then covered with plastic mulch.

An onion seed is planted in a plant hole at 15 x 10 cm2. Fertilization with a dose of Urea 200 Kg. Ha^{-1}, SP-36 150 Kg. Ha^{-1}, KCL 150 Kg. Ha^{-1} is done 2 weeks after planting and plant maintenance for 2 months. Observations were made on growth, production, and infection with bulb rot and leaf blight. The results showed that each variety has different growth, yield and disease intensity. Peking Putih variety had been most infected by leaf blight, while Sembrany variety had been most infected by bulb rot. Bima variety was resistant to leaf blight diseases, while Solok, Batu Ijo, and Peking Putih were resistant to bulb rot disease. Peking Putih variety showed the best percentage of viability, number of tillers and bulbs, while Solok variety showed the best diameter of tubers was found in. Solok variety showed the highest bulb weight with a potential yield of 8. 82g.plant^{-1} or 4.551 ton. ha^{-}1. These results shown are close to the description of the variety. Based on growth, yield and disease intensity, it is recommended that the Solok variety shall be planted in the Bengkulu lowlands.

Keywords: Shallots-varieties, late Blight, bulb rot, growth

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Efficacy of Four Bio-Organic Fertilizer Formulas containing Salinity Tolerant Bacteria Consortia to Increase Corn Growth and Yield in Salinity Stress

R. Noviani [1], M. Handajaningsih[1], and Marwanto[1]
Agroecotechnology Study Program, Faculty of Agriculture, University of Bengkulu

**Corresponding author:* marwanto@unib.ac.id

Abstract

Corn is an important crop in Indonesia after rice, but corn production is still relatively low. Increasing corn production in Bengkulu is possible through land extensification. Bengkulu province has a coastline of ± 525 km, so it is estimated that this area has tidal plains and coastal areas affected by salinity are quite extensive. Bioremediation using *rhizobacteria* is expected to increase the tolerance of corn plants to salinity stress. Therefore, this study aimed to determine a bio-organic fertilizer formula containing a consortium of saline-tolerant bacteria that was able to maximize the growth and yield of maize under salinity stress conditions. The experiment was carried out from September 2021 to March 2022, in Bengkulu City. The study was conducted using a split plot design with a completely randomized design (CRD). The main plot was salinity stress, namely S1 (0.5 dS m^{-1}), S2 (3.5 dS m^{-1}) and S3 (5.3 dS m^{-1}).

Furthermore, the subplot was bio-organic fertilizer formulas with 4 levels, namely Formula 1, Formula 2, Formula 3 and Formula 4. All of those formulas were cow manure based which were added with rhizobacteria. The results showed that the bio-organic fertilizer formula was able to increase the tolerance of corn plants to salinity. The Formula 4 in combination with S2 (3.5 dS m^{-1}) level of salinity showed the best effect compared to the other combinations. This combination resulted leaf greenness of 54.53, root fresh weight 338.50 g/plant, root dry weight (88.50 g/plant). The shoot fresh weight of plant was 483.00 g, the shoot dry weight was 147.27 g/plant. Weight of cobs per plant with husk reached 442.00 g , while the weight of cobs per plant without husk was 344.67 g. The Formulla 4 + salinity level 3.5 dS m^{-1} did not affect the weight of 100 kernels (seeds). Meanwhile, under salinity stress of 5.3 dS m^{-1}, the Formula 4 performed the highest weight of 100 seeds compared to the other formulas. The level of salinity stress solely showed that 3.5 dS m^{-1} improved corn leaf area and number of seeds per row of corn cob. The Formula 4 as single factor increased corn leaf area and number of seeds per row of corn cob, and seed weight of corn cob.

Keywords: Salinity Stress, Corn, Bio-Organic Fertilizer, Salt Tolerance

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Antibacterial Activity of Papaya Leaf (*Carica papaya* L.) against *Escherichia coli*

O.P.I. Sari, Dewi Jumiarni*, N. Murniati
Department of Biology Education, Faculty of Teacher Training and Education, Bengkulu University

**Corresponding author: dewij@unib.ac.id*

Abstract

Indonesia has diversity of medicinal plants, including papaya (*Carica papaya* L.). Previous research revealed that papaya leaves have several active compounds that are useful as antifungal, anti-inflammatory, and antibacterial. Moreover, the Bengkulu community used papaya leaves as a traditional medicine to treat diarrhea from generation to generation. This study aimed to analyze the inhibition of leaf extract of papaya (*Carica papaya* L) cultivar Bangkok against the bacteria *Escherichia coli*. The results of this study are expected to be very important as initial information for the development of modern medicine, especially to find sources of new medicinal ingredients derived from local biodiversity. This study is an experimental study. Extraction of papaya leaves using the maceration method with 96% ethanol solvent. Inhibition zone testing was carried out using the disc diffusion method, with a concentration of papaya leaf extract at 40%, 60%, 80%, 100%, aquadest (negative control), and Ciprofloxacin antibiotic (positive control). Each treatment was repeated five times. The results showed that papaya leaves of the Bangkok cultivar have an inhibited effect on *Escherichia coli* growth. The diameter of the inhibition zone at extract concentrations of 40%, 60%, 80%, and 100% were 10.26 mm; 10.77 mm; 12.02 mm; and 12.33 mm, respectively. The diameter of the inhibition zone at positive control was 26.21 mm and at negative control was 0 mm. However, the inhibition zone with 100% extract was lower than the positive control with the antibiotic ciprofloxacin.

The presence of an inhibitory zone in each treatment concentration of papaya leaves (*Carica papaya* L.) is due to the active substances contained in papaya leaves (*Carica papaya* L.) such as flavonoids, alkaloids, saponins, and tannins. The results obtained are different from the results of previous studies. The difference in the resulting inhibition zone was probably caused by the papaya leaf extract sample used. In the previous study, the papaya leaf used was the California cultivar, while in this study, the papaya leaf of the Bangkok cultivar was used. The selection of papaya leaves of this Bangkok cultivar is because there is a higher content of flavonoid antibacterial active compounds than other types, such as papaya leaves of the California cultivar. According to research by Nisa et al. (2019), the total value of flavonoids in papaya leaf extract of the Bangkok cultivar is around 50.34 micrograms/gram, while the in the California papaya leaves is 46.02 micrograms/gram. This is what can cause the average diameter of the inhibition zone of the papaya leaf ethanol extract of Bangkok cultivar to be larger. Thus, from this study, it can be concluded that papaya leaf extract inhibits *E. coli* growth. The higher concentration of the extract, the stronger the inhibition. The strongest inhibition

was at 100% concentration with an inhibitory zone of 12.33 mm, or a strong category in inhibiting *Escherichia coli* growth.

Keywords: antibacterial activity, papaya, traditional medicine

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Effect of the Crude Extract from *Melaleuca cajuputi* to Control *Colletotrichum* sp. Causing Agent of Fallen leave Disease of Para Rubber

S. Dasae[1], F. Ibrohim[1], S. Kaewchai[3*]
Faculty of Agriculture, Princess of Naradhiwas University, Naradhiwas, Thailand

*Corresponding author: saithong@pnu.ac.th

Abstract

The aim of this research was to study the effect of the crude extract from *Melaleuca cajuputi* to control *Colletotrichum* sp. causing the agent of fallen leave disease of para rubber. The fresh leaves of *Melaleuca cajuputi* were collected, air dried, and ground into small pieces. The ground leaves were divided into 2 parts, the first part was soaked in water for 24 hours at the concentration of 1:10, 1:15, 1:20, and 1:25 W/V. The supernatant was filtered with filter paper. The second part was soaked in 95% ethanol for 72 hours at 1:10 W/V and filtered for supernatant and evaporator for the crude extract. The methodology was poisoned food technique by adding the crude extract into a sterile PDA (potato dextrose agar) petri dish at the concentration of 1:10, 1:15, 1:20, and 1:25 W/V for the crude extract by water, and at the concentration of 400, 600, 800 and 1000 mg/L for the crude extract by 95% ethanol. The agar plug of *Colletotrichum* sp. at the age of 10 days was placed at the center of the petri dish. The control was done in the same way but without crude extract. The mycelium growth of *Colletotrichum* sp. was recorded and calculated to mycelium inhibit percentage. The results found that the crude extract by water at the concentration of 1:10 W/V gave the best mycelium inhibit percentage at 23.75%. The crude extract by 95% ethanol at the concentration of 1000 mg/L gave the best mycelium inhibit percentage at 56.67%.

Keywords: crude extract, *Melaleuca cajuputi*, fallen leave disease, para rubber

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Chemical composition and Digestibility of pith Oil Palm Trunks fermented for Animal Feed

A. Ausengmake, T. Kraiprom*, S. Jantarat, K. Longnapa, Daniel Kofi
[1]Faculty of Science and Technology Prince of Songkla University, Pattani campus, 94000, Thailand
[2]Palmy Industrial Partnership Ltd

**Corresponding author: thaintip.k@psu.ac.th*

Abstract

The fermented the pith that part of oil palm trunks (OPT) has high potential to animal feed. The objective of this research was to study the chemical composition of fermented pith of OPT and digestibility by enzyme pepsin. This research had 5 treatments and 3 replications of each treatment with Completely Randomized Design (CRD). The 5 treatments compose of the pith of OPT fermented at 30 days (T1), the pith of OPT fermented with 1% of dried yeast at 30 days (T2), the pith of OPT fermented with 2% of dried yeast at 30 days (T3), the pith of OPT fermented with 3% of dried yeast at 30 days (T4); the pith of OPT fermented with 4% of dried yeast at 30 days (T5). The dried yeast composes of 98.85% of *Saccharomyces cerevisiae*. The results showed that the pith of OPT fermented with yeast 1-4% decrease pH content (3.82-3.37). Moreover, the fat content of T1 (6.60%) was significantly higher than T4, T3, T5 and T2 (5.39, 5.07, 4.84 and 4.37%), respectively ($P<0.05$). The crude protein in T5 (16.56%) was significantly higher than T4, T3, T2 and T1 (15.77, 13.83, 13.26 and 12.37%), respectively ($P<0.05$). The digestibility of pith OPT fermentation by enzyme pepsin was significant higher in T2 (97.68 %) than T3, T1, T4 and T5 (95.78, 92.79, 90.43 and 90.24 %), respectively. Moreover, the number of yeast and mold fermented in pith of OPT decreased when yeast concentration was increased (5.4x107, 7.5x105, 6.1x105, 3.0x105 and 2.3x105 CFU/g), respectively. It was concluded in this study that the pith of OPT fermented at 30 days with or without yeast that is for animal feed due to high nutritive value and high digestibility.

Keywords: chemical composition, pith Oil Palm Trunks, animal feed

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Optimal level of Andrographis paniculate bio-extract in Drinking water on Egg Production Performance and Egg Quality of Japanese quail

Kadayloding, I. Deemea*, S. Jehming, S. Saleh, B. Matukae, M. Samaae
Faculty of Science Technology and Agriculture, YalaRajabhat University

**Corresponding author: Bukhori.m@yru.ac.th*

Abstract

The objective of this research was to study the optimum and suitable Andrographis fermentation level in quail egg production performance and egg quality at the level. 0,0.5,1.0,1.5 The water content of 208 quail at 4-7 weeks was divided into 4 groups, 4 groups, and the first group received water without supplementation, herbal brine, and group 1. At 2,3,4, the andrographis fermentation was added at 0.5,1.0,1.5 levels, respectively. The initial and end quail weights were recorded. How much you eat and how much water you eat Egg production was recorded and egg quality was analyzed for 4 weeks. The results showed that Andrographis fermentation had statistically no difference in productivity (P> 0.05), water intake, feeding, and egg feeding percentage. Giving eggs and the rate of conversion of food into eggs with reduced rates and it was found that the Andrographis supplementation at level 1.5 had a better effect than other groups.

Keywords: Japanese quail, create, productivity, egg quality

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Ultrasonic-Assisted Solvent Extraction (USE) of Stingless Bee Honey from *Heterotrigona itama* and LC MS/MS Identification of Chemical Compounds

H. Datumada[1,2], T. Hayimad[2], T. Thongsaiklaing[1,2*]
[1]Biotechnology and Molecular Biology Laboratory (BMBL), Faculty of Agriculture, Princess of Naradhiwas University, Narathiwat, Thailand 96000
[2]Division of Animal Science, Faculty of Agriculture, Princess of Naradhiwas University, Narathiwat, Thailand 96000

**Corresponding author: thanasetfdr@gmail.com*

Abstract

Stingless bee is a small size and non-function sting, across tropical and subtropical regions around the world (Latin America, Africa, South Asia, and northern Oceania), with more than 500 species, and 32 genera identified, besides pollinators. This bee has produced unique honey with physicochemical characteristics that consisted of various chemicals composition. Many research publications reported about chemical substances in their honey including sugar, amino acid, fatty acid, flavonoid, phenolic acid, phenolic compound, polyphenol, diterpenoid antioxidant compounds, proteins, enzymes, carotenoids, organic acids, antioxidant compounds, vitamins, and minerals. They exhibit the medicinal potential to be used to control various pathological conditions, tumours, cancers, inflammations, arthritis, visual disorders, neurological disorders, atherosclerosis, hypertension, diabetes, and ageing.

The consideration detail for flavour, taste and colour contains present in stingless bee honey are strongly associated with botanical sources, resin, geographical region, climate conditions, environment around the food support area, storage conditions and bee species. Several styles of stingless bee honey production of have been growing, particularly in Southeast Asia. Most species of stingless bees are commercially bred by farms such as *Geniotrigona thoracica* (Smith, 1857), *Heterotrigona itama* (Cockerell, 1918), *Lepidotrigona terminata* (Smith, 1878), and *Tetragonula laeviceps* (Smith, 1857). The selling price of this honey is about USD 100 per kilogram. The aim of this research was to identify the chemical compounds of stingless bee honey, *Heterotrigona itama* growing in the local community area. One kilogram of fresh stingless bee honey was collected from honey pots and transferred into dark Duran bottom.

Obtain honey was dissolved with distilled water ratio 1:1 (V/V) and mix well. After that, ethyl acetate an extraction solvent was added to the honey solution ratio 1:1 (V/V) and vigorous sharked. Then, transfer to the ultrasonic cleaning chamber used for ultrasonic-assisted solvent extraction (USE) at the frequency of 35 kHz at 35 ± 5 ºC. Sonication was maintained 30 seconds for 3 times. Centrifuge 9,000 rpm for 10 minutes, supernatant as an organic solvent layer was collected to a new flask. Pool obtains supernatant and evaporates vacuum was performed a rotary evaporator. The LC-MS/MS analysis was performed Agilent UHPCL column: Zorbax Eclipse Plus C18 Rapid Resolution HD 100 mm length x 2.1 mm inner-diameter, particle size 1.8 µm and 10 µL of injection volume. Data analysis software was used MassHunter WorkStation. The results of the

combination techniques between ethyl acetate and ultrasound-assisted solvent extraction found twenty chemical compounds These compounds were composed of monosaccharide, amino acid, fatty acid, flavonoid, phenolic acid, lignan and various conjugate substances.

Keywords: stingless bee honey, ultrasonic-assisted solvent extraction, LC MS/MS

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Inventory of Macrofungi in Konak Protected Forest, Kepahiang, Bengkulu

R. Refa'i, Dewi Jumiarni*, A. Rahman
Department of Biology Education, Faculty of Teacher Training and Education, Bengkulu University

*Corresponding author: dewij@unib.ac.id

Abstract

The Konak Forest in Kepahiang Regency is a conservation forest area located in Bengkulu Province where the area vegetation is well preserved. The area of the Konak Forest is 6 hectares with the main vegetation being pine trees. This forest has important functions such as supporting the life of flora and fauna, preventing flooding, controlling erosion, maintaining soil fertility, and serving as a source of firewood for the surrounding community. The condition of vegetation that is still maintained will be associated with a high potential for biodiversity. However, research on biodiversity in the Kepahiang Konak Forest is still limited. One of the various types of biodiversity that are thought to exist in the Kepahiang Konak Forest ecosystem is various types of macrofungi. Until now, there has been no inventory activity to determine the types of macrofungi in the Kepahiang Konak Forest. This study aims to inventory the diversity of macrofungi in Konak Forest. This study is exploratory descriptive research. The area studied for sampling was 10% of the total area (6000 m2). Sampling was conducted by purposive sampling method at three different stations by cruising technique.

The first station is dominated by pine trees (*Pinus merkusi*) and meranti trees (*Shorea sp*). Forest shrubs are overgrown with Heliconia plants or banana flowers. The second station is dominated by candlenut trees (*Aleurites moluccanus*). The forest floor contains grass and shrubs. The third station is dominated by a pong pong tree (*Cerbera odollam*) with a height of 4-5m. The forest floor is overgrown with shrubs with a height of 30 -100cm. The macrofungi were observed for their morphological characteristic including habitat, size, shape, color, and utilization. The samples obtained were photographed and identified. This study found 22 species from 12 families of macrofungi. Two species belong to the phylum Ascomycota and others belong to the phylum Basidiomycota.

The macrofungi were found including *Daldinia concentrica, Xylaria longipes, Pleurotus ostreatus, Ganoderma sessile, Oudemansiella megalospora, Pycnoporus sanguineus, Polyporus arcularius, Trametes elegans, Trametes pubescens, Trametes versicolor, Trametes betulina, Microporus xanthopus, Nigroporus vinosus, Parasola plicatilis, Parasola conopilus, Cymatoderma elegans, Auricularia aricula, Schizopylum commune,* Mycena galericulata, *Gymnopus querchophilus.* The most found were Polyporaceae family, with as many as 8 species. The Polporaceae family is the most species variety as this family has good adaptations seen from the hard and woody fruit body texture with result that it has tolerance to an environment that is not in accordance with macrofungi. The macrofungi obtained have several types of roles such as *Pleurotus ostreatus, Auricularia aricula*, and *Schizopylum commune* that are edible, and some macrofungi contain medicinal compounds such as *Pycnoporus sanguineus*, *Polyporus*

arcularius, Trametes versicolor, Cymatoderma elegans, Ganoderma applanantum, and *Microporus xanthopus*. Environmental factors at the station were 27.7oC-30.1oC for temperature, 82%-95% for humidity, and 59-440 Lux for the light intensity which are appropriate conditions for macrofungi growth.

Keywords: macrofungi, protected forest, Konak forest

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Effect of Table Sugar on The Growth of Chrysanthemum in Aseptic Condition

R. Wamaedeesa*, S. Doloh, N. Mamah
Faculty of Agriculture, Princess of Naradhiwas University, Khok-khian, Mueang, Narathiwat, 96000

**Corresponding author: raheema.w@pnu.ac.th*

Abstract

Chrysanthemums are popular cut flowers with the most in demand. Since the current production for domestic trade is still insufficient, resulting in having to be imported from abroad. The Micropropagation technique is widely used to produce abundant chrysanthemum seedlings. However, a suitable methodology to produce enough chrysanthemum seedlings by using plant tissue culture is required. Hence, this study aimed to identify the suitable concentration of table sugar for the growth of apical shoots of chrysanthemum cultured under sterile conditions. The apical shoots were cultured on MS medium containing 0, 30, 40, 50 and 60 g/l sugar. The cultures were incubated for six weeks in a growth chamber (25° ± 1°C) under cool white fluorescent lamps providing the light intensity of 77.78 µmol m-2s-1. The photoperiod was adjusted to a 16/8 h light and dark cycle. It was found that the apical shoots of chrysanthemums cultured on all media had a 100 % survival rate.

The average height, number of roots and number of leaves of chrysanthemum seedlings had significant differences (P≥0.01). Comparing the average height and number of roots of seedling grown on MS medium with and without table sugar, it showed that MS medium with table sugars at all concentrations had a higher average height, number of roots and shoots than MS medium without table sugar. Consequently, it was found that adding 50 grams per liter of table sugar gave the highest value of shoot height (8.13 cm.), the highest number of roots (25.9 roots) and leaves (27.7 leaves), and the highest value of fresh weight (0.59 g). Moreover, adding 60 grams per liter of table sugar gave the highest number of shoots (1.6 shoots). Hence, table sugar can be used as carbon source for micropropagation of chrysanthemums.

Keywords: chrysanthemums, plant tissue culture, table sugar, MS medium

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Drone Utilisation in Mangrove Ecosystem Inventory in Muara Jenggalu Bengkulu City

Syafa Aisyah Putri, Ayub Sugara, Agung Hasan Lukman, Ari Anggoro
Faculty of Agriculture, University of Bengkulu Jl. W.R. Supratman, Kandang Limun, Bengkulu 38371

*Corresponding author: syafaaisyahputri@mhs.unib.ac.id

Abstract

Mangroves play a significant role in coastal ecology: as a habitat for a complex interaction of various marine life such as crabs, hermits, small fish, gastropods, and coastal organisms, waves and storms barrier minimize damage due to coastal disasters, tourism, research and education location. Furthermore, it provides environmental services, including biodiversity preservation, gas regulation, climate regulation, genetic resources, and regulators of trophic dynamics of species and populations (biological control). The extent of mangrove degradation is relatively increasing every year. Over the past 25 years, Indonesia has lost 30.1% or 1.3 million hectares of mangroves. Some studies report that 11 out of 70 (16%) mangrove species are known to be endangered. The causes of this degradation include mangrove logging as a source of wood and non-timber, conversion of mangrove land into shrimp ponds, salt ponds, agricultural land, settlements, and tourism; and lack of fresh water supply due to dam construction. Given the problem of mangrove degradation globally, it is necessary to manage the natural resources of mangrove ecosystems. This management requires geospatial data obtained through remote sensing technology, such as drones. Remote sensing is an essential technology in the spatial inventory and monitoring of natural resources, and its use is constantly increasing for projects in various fields.

At least 11 remote sensing roles can be applied to explore mangrove information, including inventory, determination of areas, composition, and species, as well as change detection and surveillance. The data obtained from satellite images and aerial photos using drones is the primary data that needs to be processed and integrated into a system that manages, analyses, and displays spatial information called geographic information systems. The ecosystem of mangrove Muara Jenggalu in Gading Cempaka District, Bengkulu City, Bengkulu Province, has complex biodiversity. The people around this area depend on living and sheltering behind the mangrove ecosystem to deal with coastal disasters. This location also has great eco-tourism potential and excellent educational value. Unfortunately, no data available can be used as a reference for spatial analysis, ecosystem distribution, and the distribution of mangrove species in this region. Therefore, it is essential to research the mangrove spatial database of the Muara Jenggalu to mitigate coastal disasters using drone technology. This research will then be related to the sustainability of the management of the biodiversity of mangrove forests in Bengkulu City. This study aims to 1) Identify the distribution and types of mangroves in the Jenggalu Estuary, Bengkulu City, 2) Conducting studies on drone technology to produce mangrove spatial data, 3) Generate an inventory of spatial databases to create an ecosystem-based

coastal disaster mitigation planning model. The research method used for this research is from literature reviews. The research outcome is expected to contribute to developing science in the sustainable use of coastal areas, create an ecosystem-based coastal community adaptation model in coastal disaster mitigation, and become an additional reference for data collection and monitoring purposes in the following related research.

Keywords: Drone, mangrove, Muara Jenggalu, remote sensing, spatial

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Screening of Rhizosphere Actinobacteria as Biological Control Agents *Xanthomonas oryzae* pv. *oryzae*

F. Muhammad[1], Y. Yanti[1] U. Khairul[1]
*Email: yy.anthie79@gmail.com; mira23@agr.unand.ac.id

ABSTRACT

Bacterial leaf blight caused by *Xanthomonas oryzae* pv. *oryzae* is an important disease in rice plants. Actinobacteria have the potential as biological agents to control *Xanthomonas oryzae* pv. *oryzae* because it has the ability to produce bioactive compounds. This study aims to select Actinobacteria isolates that can suppress the development of *Xanthomonas oryzae* pv. *oryzae* and possibly to stimulate in-plant growth of rice plants, as well as to determine the antagonistic ability of Actinobacteria and enzymes that inhibit the growth of *Xanthomonas oryzae* pv. *oryzae*. The research was conducted at the Microbiology Laboratory and Experimental Garden of the Faculty of Agriculture, Andalas University, Padang, the tools and materials in this study, 70% alcohol, distilled water, starch-casein-agar (SCA) media, ISP2 media, wakimoto media, starch-casein-broth media (SCB), ISP broth media, NA media, Skim Milk Agar, CMC (carboxymethyl cellulase), MRSA (deMann Rogosa Sharpe Agar), McFarland solution, manure, sterile soil, The materials used in this study were alcohol 70 %, distilled water, starch-casein-agar (SCA) media, ISP2 media, wakimoto media, starch-casein-broth (SCB) media, broth ISP2, NA media, Skim Milk Agar media, CMC (carboxymethyl cellulase) media, media MRSA (deMann Rogosa Sharpe Agar), McFarland solution, manure, sterile soil, aluminum foil, tissue, cutton plastic cups, clear plastic, filter paper, and label paper, cotton buds.

The study was divided into three stages: ie., isolation and biosafety testing (hemolysin test, hypersensitivity reaction, and pathogenicity test) of actinobacterial isolates from the roots of rice plants in three districts in West Sumatra, selection of potential Actinobacteria isolates in suppressing the development of bacterial leaf blight and increasing the growth of rice plants. In-plantation, and assays for antagonists and potential activity of Actinobacteria enzymes. The results showed that 30 isolates were isolated from the rhizosphere of rice plants in three districts in West Sumatra, and 25 isolates were successfully selected based on biosafety tests. The results of the in-plant test showed that 10 isolates had the ability to increase the growth of rice plants and suppress the development of bacterial leaf blight. Antagonist test results showed that 5 isolates were antagonistic to *Xanthomonas oryzae* pv. *oryzae* with an inhibitory index of 5,66-6,66 mm. Five isolates were selected: APRD 3I211, APRD 1I122, APRP 2S121, APRP 1I121, APRP 3I212. Of the five isolates, four isolates had the ability to produce protease enzymes, five isolates had the ability to produce cellulase enzymes, and five isolates had the ability to produce amylase enzymes.

The conclusion of this study was that Actinobacteria were successfully selected in three districts in West Sumatra, the isolates of Actinobacteria that had been isolated were

proven to be able to suppress the development of bacterial leaf blight in rice plants in-planta, and showed antagonistic ability against *Xanthomonas oryzae* pv. *oryzae* and capable of producing protease enzymes, cellulase enzymes, and amylase enzymes.

Keywords: Actinobacteria, *Xanthomonas oryzae* pv. *oryzae*, resistor zone, secondary metabolites.

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

SCREENING OF ANTIMICROBIAL PRODUCING ENDOPHYTIC BACTERIA OF CARDAMOM (*Amomum compactum* L.) FROM NORTH BENGKULU DISTRICT, INDONESIA

Y. Harmelayati[1], H, Wibowo, R[1],W. Darwis[1], Sipriyadi[1], R. Sinaga, L[1], N Aini[1], D. Sari, T[1], R. Dewi[1], C. Simanjuntak, P. H[1], G. Tumanggor, A[1], S. Shabrina[1], Agustiono[1], D. Kurniawan[1], C. Berliana[1], R. Fauzan, A[1], A. Putri, A[1]

[a)] Corresponding [1]Undergraduate student, Department of Biology Faculty of Mathematics and Natural Sciences, University of Bengkulu, W.R. Supratman St., Bengkulu City, Indonesia [2]Department of Biology Faculty of Mathematics and Natural Sciences, University of Bengkulu, W.R.Supratman St.,Bengkulu City, Indonesia
[3]Graduate School of Biology Program, Faculty of Mathematics and Natural Sciences, University of Bengkulu, W.R. Supratman St., Bengkulu City, Indonesia

author: Riskyhadiwibowo80@gmail.com

ABSTRAK

Endophytic bacteria are bacteria that live in host plant tissues without causing disease symptoms and many benefits, these bacteria enter plant tissues generally through roots. Endophytic bacteria can secrete secondary metabolites that are antagonistic to pathogens, the metabolites produced can also lyse pathogenic cell walls from fungal groups. Secondary metabolite compounds possessed by a bacterium have functions including acting as a virulence factor between microbes and plants, as well as a form of symbiotic interaction between microbes and host organisms. These bacteria can be obligate or facultative in colonizing and will produce the same bioactive compounds as their host plants. Almost every higher plant has some endophytic bacteria, one of which is cardamom (*Amomum compactum* L.) from North Bengkulu. This study aimed to find a potential source of antimicrobial cardamom isolated from the rhizome, stem and leaves of the cardamom plant (*Amomum compactum* L.). Cardamom samples were collected by placing them in plastic in a dry/non-moist state to prevent the growth of fungus on cardamom. Isolation of endophytic bacteria was carried out by grinding method with serial dilutions of 10^{-1}, 10^{-3}, 10^{-5}, each dilution series was pipette 0.1 ml onto Nutrient Agar medium and spread with a spreading rod. The bacterial isolates that grew were then purified by the quadrant method and then incubated at 25-30 ^{o}C for 48 hours and identified by morphological observation, Gram staining, biochemical tests (catalase test, carbohydrate test, citrate utilization test, urease test, starch hydrolysis test) , and assays for antagonists against pathogens. A total of 22 isolates were obtained from endophytic bacteria isolates that had been isolated from rhizome organs, stems, and cardamom leaves with 8 isolates from rhizome, 6 isolates from stems and 8 isolates from leaves. A total of 11 isolates of gram-positive bacteria and 11 isolates of gram- negative bacteria were obtained by Gram staining. In the biochemical test, it was found that 7 isolates were close to the genus *Bacillus*, 4 isolates were close to the genus *Azotobacter*, 3 isolates were

close to the genus *Staphylococcus*, 3 isolates were close to the genus *Rhizobium*, 1 isolate was close to the genus *Citrobacter*, 1 isolate was close to genus *Zymophillus*, 1 isolate was close to the genus *Sporalactobacillus*, 1 isolate was close to the genus *Micrococcus*, 1 isolate was close to the genus *Methylobacillus*. Antimicrobial activity tests were carried out against *Staphylococcus aureus*, *Escherichia coli*, and *Candida albicans* bacteria. The results showed the greatest inhibitory zone activity was generated by isolate code KLR 4 against *S. aureus* (16.2 ± 11.46 mm) with strong activity, *E. coli* (8.6 ± 3.68 mm) with very strong activity, and *C. albicans* (21.21 ± 0.21 mm) with very strong activity.

Keyword: Endophytic Bacteria, Antimicrobials, Cardamom (*Amomum compactum* L.)

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

DIVERSITY OF ENDOPHYTIC BACTERIA OF KAPULAGA (*Amomum compactum* L.)

Agustiono[1], R.Wibowo[1], H, W. Darwis[1], Sipriyadi[1], L. Sinaga, R[1], N Aini[1], T. Sari, D[1], R. Dewi[1], C. Simanjuntak, P. H[1], G. Tumanggor, A[1], S. Sabrina[1], Y. Harmelayati[1], D. Kurniawan[1], C. Berliana[1], R. Fauzan, A[1], A. Putri, A[1]

[1]Undergraduate student, Department of Biology Faculty of Mathematics and Natural Sciences, University of Bengkulu, W.R.Supratman St.,Bengkulu City, Indonesia
[2]Department of Biology Faculty of Mathematics and Natural Sciences, University of Bengkulu, W.R.Supratman St.,Bengkulu City, Indonesia
[3]Graduate School of Biology Program, Faculty of Mathematics and Natural Sciences, University of Bengkulu, W.R.Supratman St.,Bengkulu City, Indonesia

[a)]*corresponding author: Riskyhadiwibowo80@gmail.com*

Abtract:

Kapulaga (*Amomum compactum* L) plants are included in the *zingiberaceae* family which is a spice plant native to Indonesia which is widely used and has benefits as an ingredient in herbal medicines. Bacteria that live in host plant tissues without causing disease symptoms, endphytic bacteria enter plant tissues generelly through roots. Endophytic bacteria can be obligate or facultative in colonizing their host and the host generelly consists of several genera and species. Usually endophytic bacteria will produce the same bioactive compounds as those produced by the host plant. This study aimed to obtain endophytic bacterial isolates and to determine the diversity of endophytic bacteria of Kapulaga. Isolation of endophytic bacteria was carried out by grinding methods with serial dilutions of 10^{-1}, 10^{-3}, 10^{-5}. After that, 0.1 ml of each dilution series was pipetted on NA medium and spread with a spreading rod. The bacterial isolates that grew were then purified and identified by morphological observation, Gram staining, and biochemical tests (catalase test, carbohydrate fermentation test, citrate utilization test, urease test and starch hydrolysis test). A total of 22 isolates of endophytic bacteria were isolated from the rhizomes, stems, and leaves of the kapulaga. Based on morphological observations, Gram staining and biochemical tests showed 22 isolates that had been isolated were close to the genera *Bacillus, Methylobacillus, Zhymophilus, Sporolactobacillus, Citrobacter, Azotobacter, Micrococcus, Staphylococcus,* and *Rhizobium.* The genus *Bacillus* consist of 7 species, the genus *Methylobacillus* consist of 1 species, the genus *Zhymophilus* consist of 1 species, the genus *Sporolactobacillus* consist of 1 species, the genus *Citrobacter* consist of 1 species, the genus *Azotobacter* consist of 4 species, the genus *Micrococcus* consist of 1 species, the genus *Staphylococcus* consist of 3 species, and the genus *Rhizobium* consist of 3 species. This shows that the Kapulaga (*Amomum compactum* L.) has a variety of endophytic bacteria.

Keyword: Kapulaga, *zingiberaceae* family, endophytic bacteria, isolates, diversi

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Diversity Of Endophytic Bacteria Of Bangle (*Zingiber cassumunar* Roxb.)

C. Simanjuntak[1], Putri H[1], H. Wibowo, R[1], W. Darwis, W[1], Sipriyadi[1], D. Kurniawan[1], R. Fauzan, A[1]

[1]Mahasiswa Jurusan Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Bengkulu, Jalan W.R.Supratman, Kota Bengkulu, Indonesia
[2]Jurusan Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Bengkulu, Jalan W.R.Supratman, Kota Bengkulu, Indonesia
[3]Program Studi S2 Biologi, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Bengkulu, Jalan W.R.Supratman, Kota Bengkulu, Indonesia

**Corresponding author: Riskyhadiwibowo80@gmail.com*

Abstract

Endophytic bacteria are bacteria found in plant tissues that do not provide infection or negative effects on the host plant. Endophytic bacteria can be found in various types of plants, especially plants that are often used as medicinal plants. One of them is the bangle (*Zingiber cassumunar* Roxb.) which comes from North Bengkulu Regency. The purpose of this study is to obtain endophytic bacteria and determine the diversity of endophytic bacteria isolated from bangle (*Zingiber cassumunar* Roxb.) from North Bengkulu Regency. The sample collection was taking part of rhizomes (stem modification), leaves, roots, and stem of bangle's (*Zingiber cassumunar* Roxb.) part. Isolation of endophytic bacteria was carried out by grinding method on Nutrient Agar (NA) media after sterilizing the surface of plant organs using soaked 70% alcohol in one minute, 5.25% sodium hypochlorite in five minutes, 70% alcohol in thirtieth seconds with three times. As many as of 34 isolates total of endophytic bacteria of bangle (*Zingiber cassumunar* Roxb.) were isolated from rhizomes, roots, leaves, and stems. Endophytic bacteria were identified based on macroscopic morphological observations (shape, color, edge, elevation, and colony surface), microscopic observations through Gram staining, and Biochemical Tests (catalase test, motility test, citrate test, urea test, carbohydrate fermentation test, and starch hydrolysis test).

As a result, the diversity of bacteria consisted of 8 genera, namely *Methylobacillus*, *Micrococcus*, *Rhizobium*, *Planococcus*, *Azitobacter*, *Alcaligenes*, *Micrococcus*, and *Rhizobacter*. The *Methylobacillus* genus consists of 1 species with isolate code BGA 1 isolated from roots, the *Micrococcus* genus consists of 2 species with isolate code BGA 2 and BGA 4 isolated from roots, the *Bacillus* genus consists of 17 species with isolate code BGA 3, BGA 7 isolated from roots, BGR 9, BGR 10, BGR 1, BGR 14, BGR 17 isolated from rhizome, BGB 24, BGB 25, BGB 26, BGB 27, BGB 28, BGB 29 isolated from stem, and BGD 30, BGD 33, BGD 34 isolated from leaves, the *Rhizobium* genus consists of 7 species with isolate code BGA 5, BGA 6, BGA 8 isolated from roots, BGR 18, BGR 19 isolated from rhizome, BGD 31, BGD 32 isolated from leaves, the *Planococcus* genus consists of 4 species with isolate code BGR 11, BGR 13, BGR 16 isolated from rhizome, BGB 23 isolated from stem, the *Azotobacter* genus consists of 2 species with isolate code BGR 20 isolated from rhizome, BGB 21 isolated from stem, the *Alcaligenes* genus consists of 1 species with

isolate code BGB 22 isolated from stem, and *Rhizobacter* which also consists of 1 species with isolate code BGR 15 isolated from rhizome. Endophytic bacteria isolated were mostly found from roots and *Bacillus* is the genus with the highest diversity of endophytic bacteria isolated from bangle (*Zingiber cassumunar* Roxb.) from North Bengkulu Regency.

Keywords: Bangle, endophytic bacteria, diversity, North Bengkulu, identification

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

POTENTIAL OF BANGLE PLANT ENDOPHYTE BACTERIA (*Zingiber Cassumunar* R.) AS THE PRODUCER ANTIMICROBIAL COMPOUNDS

D. Sari, T[1], H. Wibowo[1], W. Darwis[1], Sipriyadi[1], R. Dewi[1], R. Sinaga, L[1] , N. Aini[1], Agustiono[1,], C . Simanjuntak, P. H[1], G. Tumanggor, A[1], S. Sabrina[1], Y. Harmelayati[1], D. Kurniawan[1], C. Berliana[1], R Fauzan, A[1], A. Putri, A[1]
[1]Undergraduate student, Department of Biology Faculty of Mathematics and Natural Sciences, University of Bengkulu, W.R. Supratman St., Bengkulu City, Indonesia
[2]Department of Biology Faculty of Mathematics and Natural Sciences, University of Bengkulu, W.R. Supratman St., Bengkulu City, Indonesia
[3]Graduate School of Biology Program, Faculty of Mathematics and Natural Sciences, University of Bengkulu, W.R. Supratman St., Bengkulu City, Indonesia

[a)] *corresponding author: Riskyhadiwibowo80@gmail.com*

Abstract

Bangle (*Zingiber Cassumunar* Roxb.) is a plant that is widely used by Indonesian people as the traditional medicine. The benefits of this plant such as fever (*antipyretic*), laxative fart (*carminative*), phlegm laxative (*expectorant*), blood purifier, laxative, antioxidant, and anthelmintic (*vermifuge*). Higher plants have endophytic bacteria, which are bacteria associated with plant tissues that have various benefits, both for humans and for plants themselves. Endophytic bacteria in bangle (*Zingiber Cassumunar* Roxb.) have a potent antimicrobial activity in inhibiting the growth of pathogenic microbes. This study aims to determine the potency of 34 isolates of endophytic bacteria from the bangle plant (*Zingiber Cassumunar* Roxb.) that have been collected at microbiology Laboratory. The collection of bangles (*Zingiber Cassumunar* Roxb.) was taken from Padang Bendar Village, Hulu Palik District, North Bengkulu Regency, Bengkulu Province.

The samples were collected the rhizomes, stems and leaves of bangle (*Zingiber Cassumunar* Roxb.). The bacterial isolates of endophytic bacteria were recultured on *Nutrient Agar* (NA) media and then used to confirm the antimicrobial activity using the antagonist method against the human pathogen microbes, namely *Staphylococcus aureus*, *Candida albicans*, and *Escherichia coli*. Pathogenic bacteria were cultured in 50 ml of *Tryptic Soy Broth* (TSB) media and shaken for 24 hours. Then 1-1.5 ml of the pathogenic bacterial culture was put into an erlenmeyer containing 100 ml of NA at ± 40 °C, homogenized, then poured into a Petri dish of ± 10 ml, waiting for the media to solidify. Isolates of endophytic bacteria were inoculated into the medium containing the pathogen using an ossicle, then incubated at 30 °C for 2 x 24 hours.

Each treatment was carried out 2 times. Positive results were indicated by the formation of clear zone bacteria in endophytic isolates. The clear zone is measured using a caliper and the zone of inhibition index is calculated. The result showed that from isolation of endophytic bangle bacteria, 34 isolates were obtained. Bacterial results showed that most of the bacteria from the genus *Bacillus* sp. 22 isolates of endophytic bacteria could inhibit the growth of *S. aureus* (isolate codes BGA sp 2, 6, 7, 8, BGR sp 9, 12, 13, 14, 15, 16, 17, 18, 19, 20, BGB sp 24, 27, and BGD sp 30, 31, 32, 33, 34,, 27 isolates of endophytic bacteria could inhibit the growth of *E. coli* (isolate codes BGA sp 2, 6, 7, 8, BGR sp 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20 , BGB 21, 23, 26, 28, and BGD sp 30, 31, 32,

33) and 5 isolates of endophytic bacteria (isolate codes BGA sp 6, BGB Sp 23) had very strong inhibitory power, and BGR sp 11, BGB sp 21, 22could inhibit the growth of *C. albicans*. It can be concluded that the isolates of endophytic bacteria from bangle plant (*Zingiber Cassumunar* Roxb.) produced antimicrobial compounds in inhibiting the growth of pathogenic microbes.

Keywords: bangle, endophytic bacteria, antimicrobial, human pathogenic microbes

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The Comparison Between Kjeldahl and Ultrasonic on Milk Protein Measurement of Fresh Milk

Usamah Abdi Kafa, Hermawan Setyo Widodo*, Yusuf Subagyo
Faculty of Animal Science, Jenderal Soedirman University, Indonesia

*Corresponding author: hsw@unsoed.ac.id

Abstract

Kjeldahl is a method to measure protein in milk that has been recognized by many official organizations, but it has many disadvantages. A safer and more efficient method is available, namely the ultrasonic method that is proposed as an alternative. The purpose of this research was to determine the accuracy, precision, and linearity as well as real milk protein measurement of both methods. The materials used were 30 samples of fresh cow's milk and standardized milk samples with 2%, 6%, and 10% of protein content. These samples were measured by both methods and triplicated for standardized milk. The obtained data were analyzed by descriptive, t-test for comparing both methods and Pearson's correlation. The average of protein by Kjeldahl and ultrasonic while measuring fresh samples were not significantly different (2.97±0.*37 vs.*3.06±0,14%; p>0.05). The result of Kjeldahl and ultrasonic in the accuracy was significantly different (101.71±5.45*vs.*85.74±0.99%; p>0.05), but it had no significantly different precision level (0,61*vs.*0.58%; p<0.05). The linearity test showed a good response for both methods (R^2 = 0.998). Both methods had a weak correlation but it is in a positive trend. Finally, ultrasonic can be used as an alternative method for measuring protein in milk other than Kjeldahl.

Keywords: milk protein, Kjeldahl, ultrasonic, validation of analytical methods (VMA)

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The Bioactivity of Vitexin Compound from *Vigna radiata* (L.) As Potential SGLT2 Inhibitor for Diabetes Mellitus Treatments: In Silico Prediction

Rejeki Siti Ferniah[1]*, Syahidah Charisa Nabila[2], Tan David Christian[2], Nabilah Evelina Dewi[2], Shindi Agustiana Nurul Cahyani[1], Syarifah Khaerunnisa[3]

[1]Department of Biotechnology, Faculty of Science and Mathematics, Diponegoro University
[2]Department of Biology, Faculty of Science and Mathematics, Diponegoro University
[3]Department of Medical Science, Faculty of Medicine, Diponegoro University

**Corresponding author: ferniah@lecturer.undip.ac.id*

Abstract

Diabetes Mellitus (DM) is a chronic metabolic degenerative disease with a high prevalence worldwide. This syndrome is generally characterized by abnormalities of glucose metabolism and insulin secretion, becoming one of the main global non-communicable diseases which keep increasing gradually. In addition to increasing blood glucose levels, DM is also indicated by a series of other disease complications including neuropathy, nephropathy, non-healing wounds, cardiovascular disease, and elevated blood pressure. Various pharmacological treatments have been invented aiming for DM management, including stimulation of pancreatic cells to increase insulin secretion, deferment of carbohydrate digestion process, and inhibition of gluconeogenesis. One of the antidiabetic drug therapies that have been immensely developed over the last few years is the use of the SGLT2 (Sodium Glucose-linked Cotransporter Subtype 2) inhibitor. Through the blocking mechanism of SGLT2 as the main transport protein in kidneys, glucose will be prevented from being reabsorbed, yet it will flow through the augmentation step and be wasted with urine. SGLT2 inhibitor as an alternative medication for DM has been proven effective over other antidiabetic pharmacotherapy agents with certain advantages: delaying cardiovascular and renal malfunction disease, reducing the risk of hypertension and hypoglycemia, lowering HbA1C levels, and preventing caloric loss. Several types of SGLT2 inhibitor drugs that have been distributed commercially and already approved by the FDA include canagliflozin (Invokana), dapagliflozin (Farxiga), and empagliflozin (Jardiance). However, these medicines are still relatively rare and have not been widely used by society in Indonesia, mainly because of the expensive price. Therefore, the exploration of natural compounds is highly required as a candidate for SGLT2 inhibitors. Drug discovery research which focused on secondary metabolites in organisms has become one of the pharmacological topics that can be used as an alternative pathway. Mung bean (*Vigna radiata* (L.)) is one of the seasonal crops of the family Fabaceae (legumes) which can be easily found in tropical areas, including Indonesia. Its seed contains a bioactive compound named vitexin, with a percentage of 95.6% of the total content in the seeds. Vitexin (apigenin-8-C-glucosidase) is a bioactive compound which is known to have an important role in the antidiabetic activity of glucose metabolism by inhibiting SGLT2 during renal glucose reabsorption. This study aimed to predict and determine the inhibitory ability and chemical interaction between vitexin compounds from mung bean seed towards SGLT2 transport protein using in silico

approach. In silico research prediction on the analysis of vitexin compounds as potential candidates for SGLT2 inhibitor was carried out to determine the mechanism of computational binding and inhibition of vitexin compounds against SGLT2. The method applied in this research is molecular docking by using several bioinformatics softwares: PyRx, PyMol, and Discovery Studio. PyRx is used to obtain binding affinity values, RMSD (Root Mean Square Deviation) values, and formed chemical bonds. Visualization of conformational and molecular interactions between vitexin ligand and SGLT2 protein was shown and observed using PyMol and Discovery Studio. Results of the study showed that the binding affinity between vitexin and SGLT2 was more negative at -10.3 kcal/mol, while the binding of the original ligand with SGLT2 yielded -9.4 kcal/mol. The RMSD values obtained by both interactions are 0 Å. The visualization results show hydrogen bonds between vitexin compound and amino acids THR113 and THR375 (threonine) in SGLT2. It can be concluded that vitexin compound in mung bean seed is a potential phytochemical compound as excellent candidate of SGLT2 inhibitor for DM treatment.

Keywords: vitexin, *Vigna radiata* (L.), SGLT2 inhibitor, diabetes mellitus, in silico

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

In Silico Analysis of Potential Tripeptide as Matrix Metalloproteinase-1 Inhibitor for Antiphotoaging and Photocarcinogenesis

Armida Bahy Qonita
IPB University

**Corresponding author:* bahy_first@apps.ipb.ac.id

Abstract

Indonesia is a country that has the greatest risk of photoaging and photo carcinogenesis because it is exposed to a higher intensity of solar UV radiation than other regions. Photoaging is a disease of skin ageing caused by UV radiation and this disease also contributes to the emergence of photo carcinogenesis which is the most severe skin cancer that causes half cases of death by skin cancer. Both diseases arise due to the production of free radical compounds by UV light that can activate Matrix metalloproteinase-1 (MMP-1) through the MAPK and NF- κB pathways. MMP-1 can degrade type-I and type-III collagen which composes 80-90% of human body collagen. Therefore, MMP-1 inhibition is needed to prevent photoaging and photo carcinogenesis. Peptide application as a skin cosmetic especially for antiaging has increased up to 7.2% in 2020. The use of synthetic peptides as cosmetic ingredients for MMP-1 inhibitors is more advantageous in terms of bioavailability and toxicity. The first step in producing this peptide is peptide design. This study aims to design a synthetic tripeptide inhibitor MMP-1 based on collagen structure and screening through molecular anchoring in YASARA Structure and prediction of bioavailability and toxicity. In this study, we designed 729 tripeptides from type-I and type III collagen binding structures then tested the inhibition of these tripeptides against MMP-1 through YASARA Structure and observed their bioavailability and toxicity with pkCSM and Protox II. The tripeptide design based on 9 residues at the MMP-1 binding site on human collagen types I and III, namely Glycine, Alanine, Arginine, Leucine, Proline, Glutamine, Valine, Threonine, and Isoleucine resulted in 729 combinations of tripeptides. The tripeptide screening based on the presence of collagen cleavage residues and hydrophobic residues resulted in 636 potential tripeptide inhibitors of MMP-1. Assays for MMP-1 inhibition through molecular docking at the MMP-1 catalytic site residues His218, Glu219, His222, Gly225, and His228 from the HEXXHXXGXXH and Zn265 active sites yielded 256 test ligands having lower binding energies and dissociation constants than the comparison ligand named Batimastat so that the best 20 ligands with the lowest binding energies and dissociation constants were selected. Prediction of tripeptide bioavailability and toxicity for topical application of the 20 ligands showed that 10 ligands with a range of ΔG -8,229 to -7,970 kcal/mol and Kd 0.929-1,436 µM have good permeability, are not skin sensitizing, are not hepatotoxic, are not carcinogenic and are classified as LD_{50} class IV and V. Their inhibitory potential is due to the binding of important sites of MMP-1 in inhibiting the collagenase-1 enzyme by hydrogen bonds and hydrophobic interactions between the enzyme's amino acids and tripeptides, also hydrogen bonds with the catalytic zinc cofactor. Our tripeptides could be as antiphotoaging and anti-photo carcinogenesis candidates by in silico prediction for

MMP-1 inhibitors. The natural ligand, comparison ligand, tripeptides RAT, RTP, RAP, RIR, RLQ, RLR, and RGT can inhibit MMP-1 by binding to catalytic Zn as well as substrate-binding residues, whereas RGR, PGR, and RGQ inhibit collagenase-1 through binding to substrate-binding residues and catalytic residue.

Keywords: antiphotoaging, anti-photo carcinogenesis, matrix metalloproteinase-1, molecular docking, tripeptide design

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Study on KUB Chickens Body Weight, Feed Consumption, Feed Conversion Ratio, and Income Over Feed and Chick Cost Treated by Cage Density

M. Darussolihin, Heri Dwi Putranto*, Kususiyah
Animal Husbandry, Faculty of Agriculture, University of Bengkulu Jl. W.R. Supratman, Kandang Limun, Bengkulu 38371

*Corresponding author: heri_dp@unib.ac.id

Abstract

Kampung Unggul Balitbangtan (KUB) chicken is one of the strains produced by Balitbangtan through a process of breeding among Indonesian native chickens (*Gallus-gallus domesticus)* for 6 generations. KUB chickens are the result of breeding from various types of native chickens originating from Cianjur, Depok, Majalengka, and Bogor areas. KUB chicken has several advantages compared to other native chickens. The advantages of KUB chickens are they can produce up to 180 eggs/bird/year, the broodiness of KUB chicken has been reduced and it can be used as a meat producer. KUB chickens can reach body weights between 0.8–1 kg within 12 weeks of harvest. KUB chickens can produce meat faster than ordinary native chickens in a raising period of 70 days intensively using commercial rations. Furthermore, for purpose of meat production, KUB chickens are usually slaughtered at age of 2.5–3 months with a weight of 1.2–1.3 kg. The objective of the research was to evaluate KUB chicken body weight, feed consumption, feed conversion ratio, and income over feed and chick cost treated by cage density. The research was conducted from September 19 to November 13, 2021, in the Commercial Zone and Animal Laboratory (CZAL), Department of Animal Husbandry, Faculty of Agriculture, University of Bengkulu. There were 216 mixed-sex KUB DOC used for a duration of 8 weeks. The research design used was Completely Randomized Design (CRD) by 3 treatments with 6 replications. The treatments were divided into P0 (cage density of 10 birds/m^2), P1 (cage density of 12 birds/m^2), and P2 (cage density of 14 birds/m^2). Parameters measured were: body weight, feed consumption, feed conversion ratio, and income over feed and chick cost (IOFCC). Data were analyzed by Analysis of Variance (ANOVA). If the results have a significant effect on P<0,05, then it will be tested further by Duncan's Multiple Range Test (DMRT). IOFCC results are discussed descriptively. The results showed that cage density significantly affects feed consumption (P<0,01), however, it did not affect other parameters (P>0,05). Feed consumption cage density of 14 birds/m^2 was the lowest. This is caused by mixing the sexes of KUB chickens and the population in the cage. IOFCC cage density of 14 birds/m^2 was the highest. This is caused by the feed consumption cage density of 14 birds/m^2 being the lowest, while the price of KUB chicken/bird is about the same. The conclusion, the higher cage density, the lower feed consumption, however it did not decrease body weight and feed conversion ratio. Income over feed and chick cost cage density of 14 birds/m^2 was higher than cage density of 10 and 12 birds/m^2.

Keywords: body weight, cage density, feed consumption, feed conversion ratio, income over feed and chick cost

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

FECG (GDF9) EXON 1 Gen Sequence Characteristic on Mega Sheep

Selintaria Pardede, Edi Soetrisno, Heri Dwi Putranto*, Widya Pintaka Bayu Putra
Animal Husbandry, Faculty of Agriculture, University of Bengkulu
Jl. W.R. Supratman, Kandang Limun, Bengkulu 38371, Indonesia

**Corresponding author*: heri_dp@unib.ac.id

Abstract

One of the farms in Indonesia that are currently developing is sheep farming. Sheep have the advantage of having prolific traits. The prolific trait is the ability to have more than one offspring in one birth, one of which is the FecG gene (GDF9) (Davis, 2004). Lamb and goat meat production from 2019 to 2023 will increase by an average of 1.85% per year and it is predicted that a surplus will still occur if reduced by domestic consumption which reaches 66,000.42 tons (Ministry of Agriculture, 2018). However, the production of Lamb in Indonesia in the last two years (2020 and 2021) decreased by 20.27% (14,209.77 tons), namely in 2020 lamb meat production was 54,188.48 tons, in 2021 lamb meat production was 55,863.16 tons, and in 2019 lamb meat production was 70,072.93 tons and the goat and lamb meat trade balance in Indonesia also experienced a deficit, with an increasing trend of 18.77% per year (Central Bureau of Statistics, 2021). To overcome this problem, it is necessary to make efforts to improve the genetic quality of livestock through crosses by taking into account the superior traits of the parents which are expected to be passed on to the next generation (Suryati *et al.,* 2008). In this study, the sheep used were a cross between Merino sheep and Garut sheep with a composition of 75% Merino sheep and 25% Garut sheep or the so-called MEGA sheep (Merino × Garut). Merino sheep have a superior body weight that can reach 150-200 kg at an adult age and are also good wool producers. Meanwhile, Garut sheep are Indonesian local sheep that have also been recognized by the Ministry of Agriculture in 2011 as Indonesian germplasm which can quickly adapt to the environment and can reproduce throughout the year (Umizakiah *et al.,* 2014). This research was conducted in April-August 2021 at the Laboratory of Animal Molecular Genetics, National Research and Innovation Agency (BRIN). This study aims to detect the presence or absence of mutation sites in exon 1 of the MEGA sheep FecG gene and to construct a phylogenetic tree in exon 1 of the MEGA sheep FecG gene. This study used 30 DNA samples of MEGA ewes and then DNA sequencing was carried out and then to test the genetic diversity was carried out using the BioEdit application and phylogenetic analysis using the MEGA X application. Based on the analysis of MEGA sheep sequencing data, no mutation was found but there were deletions at positions g.2226_2231indel.TACT and g.2344_2346indel.G and based on phylogenetic analysis, MEGA sheep were in the same cluster as sheep from Iraqi, Iranian Mehraban, Brazilian, Norwegian White Sheep, Mexican Pelibuey, Chinese, American, and Sudanese Watish, Sudanese Shugor, and Sudanese Dubasi. The results of this study can be concluded that there is no mutation in exon 1 of the FecG gene (GDF9) in MEGA sheep and cannot be used as a molecular marker to obtain prolific sheep and exon 1 sequences of the FecG gene (GDF9) of MEGA sheep are in one cluster. the same as the Iraqi, Iranian Mehraban, Brazilian, Norwegian

White Sheep, Mexican Pelibuey, Chinese, American, Sudanese Watish, Sudanese Shugor, and Sudanese Dubasi sheep breeds.

Keywords: MEGA Sheep, prolific, mutation, phylogenetic, sequencing

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Effect of *Indigofera zollingeriana* and *Pennisetum purpureum* Level in the Diet on Dry Matter, Organic Matter Digestibility, and Ruminal pH in Vitro

Rapi Rapelino*, Irma Badarina, Dwatmadji
Animal Husbandry, Faculty of Agriculture, University of Bengkulu
Jl. W.R. Supratman, Kandang Limun, Bengkulu 38371

**Corresponding author:* rapirapel53@gmail.com

Abstract

Diet has a significant role in animal productivity. The ruminant diets are arranged from forages and concentrates. The availability of forages especially grasses often have scarcity problem caused by land conversion and dry season. On the other hand, the price of concentrates feed is still expensive. The effort to use the tree leguminous as a source of forages such as *Indigofera zolligeriana* is the alternative to overcome the forage shortage. *I. zolligeriana* has several advantages such as fast growth, adaptability in non-arable land, good response to fertilization, and easy maintenance. *I. zolligeriana* has also a good nutritive value so it can be used as ”green concentrate”. On the other hand, *I. zolligeriana* was reported to contain secondary metabolite tannin and saponin. Regarding ruminant nutrition, tannin and saponin were anti-nutritional compounds that have both beneficial and detrimental nutritional effects. The beneficial effects may include better utilization of dietary protein, faster body weight or wool growth, higher milk yield, increased fertility, and improved animal welfare and health through the prevention of bloat and reduced worm burdens. The adverse effects included low palatability, impaired diet digestibility, and potential toxicity to some rumen micro-organisms. These compounds had associated effects on digestibility and rumen fermentation. However, the expression effects depend on the source and level of application. This research aimed to evaluate the effect of *I. zollingeriana* and *Pennisetum purpureum* levels in the diet on dry matter, organic matter digestibility, and ruminal pH in vitro. This research was conducted at the Dairy Nutrition Laboratorium, Department of Feed Technology and Nutrition, Faculty of Animal Science, Bogor Agriculture University. The forages (*I. zolligeriana* and *P. purpureum* cv. Mott) were harvested from the outdoor laboratorium Animal Science Department, Faculty of Agriculture, University Bengkulu. The Completely Randomised Design were arranged with five treatments and four replications respectively. The treatments were T1=60% *P. purpureum* cv. Mott, T2 = 45% *P. purpureum* cv. Mott + 15% *I. zollingeriana*, T3 = 30% *P. purpureum* cv. Mott + 30% *I. zollingeriana*, T4 = 15% *P. purpureum* cv. Mott + 45% *I. zollingeriana*, and T5 = 60% *I. zollingeriana*. All the treatments were supplied with rice bran 40%. The in vitro digestibility was evaluated according to Tilley and Terry method. Ruminal pH was measured by using a pH meter. The variables observed were ruminal pH, dry matter, and organic matter digestibility. The one-way ANOVA and Duncan's multiple range test were applied. $P < 0.05$ is considered significant. The result showed that there is no significant difference in ruminal pH ($P>0.05$). The ruminal pH was in the normal range which was 6.66-6.73. The optimum condition for rumen microbial fermentation is when ruminal pH is in the range of 6.0-6.9. Digestibility is one of the major determinants of

forage quality. The increasing level of *I. zollingeriana* to *P. purpureum* cv. Mott had no significant effect to dry matter and organic matter digestibility. The dry matter digestibility was around 60,56%-70.46% where T1=70,46±11,45%, T2=63,64±8,91%, T3=63,25±13,24%, T4=66,39±13,40%, and T5=60,56 ±3,88%. The organic digestibility was around 60.01%-65.99% where T1=60,01±10,54%, T2=61,42±8,79%, T3=61,83±14,11%, T4=65,99±15,14% and T5=62,62±9,67%. Based on the digestibility, the diets were classified as "good" because their digestibility was more than 60%. This digestibility value can support the rumen microbial growth and in turn ruminant performance. The conclusion of this research is the use of *I. zollingeriana* up to 60% in the diet had no negative effect on digestibility and ruminal pH.

Keywords: *Indigofera zollingeriana*, digestibility, ruminal pH

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Diversity, Percentage of Attacks, and Control Techniques of *Spodoptera* spp. on Maize Planting in Wado District, Sumedang Regency

Iis Nurmalasari
Department of Plant Pests and Diseases, Agriculture Faculty, Universitas Padjadjaran
Tanjung Sari, West Java, Indonesia, 45363

Corresponding author: iis18001@mail.unpad.ac.id

Abstract

Maize (*Zea mays* L.) has a strategic role in the Indonesian economy because it has many functions which are often called 4F, namely Food, Feed, Fuel, and Fiber. *Spodoptera* spp. is a type of pest that attacks maize plants. Wado is one of the sub-districts with the highest corn productivity level in Sumedang, averaging at 9.47 tons/ha. Several pests of the genus *Spodoptera* that attack maize are *Spodoptera mauritia*, *S. exempta, S. exigua, S. litura,* and *S. frugiperda*. This pest group attacks various stages of maize plants and causes heavy damage if not controlled. Knowledge of species presence and insect monitoring is needed to prevent higher damage. The purpose of this research was to study the diversity, attack percentage, and control of *Spodoptera* spp. on maize in Wado District, Sumedang Regency. The experiment was conducted using the observation method. The sampling technique used was purposive sampling. Sampling was carried out in 4 villages in Wado District, namely Cisurat Village, South Cikareo Village, Sukajadi Village, and Cilengkrang Village. Each village took 5 samples, so the total was 20 maize fields. The rearing process and species identification were carried out at the Laboratory of Plant Pests, Faculty of Agriculture, Universitas Padjadjaran. The observations for control techniques of *Spodoptera* spp. were carried out by survey methods or questionnaires which would be completed by farmers to determine the control techniques used in the local area. The number of samples of farmers in each field is 5 people so the total number of farmers who fill out the questionnaire was 100 farmers. The result showed that there was one species found in Wado District, namely *S. frugiperda,* and Shannon's diversity index was in a low category (0.14). This was caused by pests on maize plants in Wado District, Sumedang Regency, only one pest species was found from the genus *Spodoptera* spp. Percentage attack of *Spodoptera* spp. included in the medium category (25.02%). The factor that affects the percentage of pest attacks on land is the population of pests and their natural enemies. The percentage of attacks will decrease if the population of natural enemies of pests on land is high. The relationship of *Spodoptera* spp. with natural enemies has a weak correlation (R^2 = 0.087). That means that natural enemies affected the population of *S. frugiperda* by 8.7%, while 91.3% was influenced by other factors than natural enemies. The low effectiveness of natural enemies against *S. frugiperda* was due to the fact that the population of insect pests was greater than the number of natural enemies. Generally, the farmers control *Spodoptera* spp. by using synthetic pesticides with the active ingredient emamectin benzoate for a duration of three times per season.

Keywords: Maize pests, natural enemies, pesticides, *Spodoptera frugiperda*

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Cool-Lit Watermelon Massage Bar: An Optimization Conditions in Formulating a Massage Bar from Watermelon Rind and Mint

S.N.H Mohammad Azmin[1]*, N.D.D Zamzuri[1], M. S. Mat Nor[2], S. Ahamad[1]
[1]Faculty of Agro-Based Industry, Universiti Malaysia Kelantan Jeli Campus, 17600 Jeli Kelantan, Malaysia
[2]Jeli Agricultural Technology (DC0008911-T), PT7458 Kampung Gemang Baru, 17700 Ayer Lanas, Jeli Kelantan, Malaysia

Corresponding author: huda.ma@umk.edu.my

Abstract

The massage bar is like a lotion but in a solid form with dual functionality. It could be used as a lotion for skin moisturization, while the oily ingredients in the massage bar could be applied for massaging purposes. Agroindustry waste like watermelon rind is precious to incorporate in the massage bar as it composes antioxidant, antifungal, antibacterial, and many more. Using this watermelon rind in this cosmetic product might reduce the landfill dumping of waste. Therefore, this research aims to formulate a massage bar using a watermelon skin extract incorporated with peppermint essential oil to give a cooling effect. This project started with extracting watermelon rind extract using an ultrasonic-assisted extraction method. The crude extract was tested for antioxidant activity and total phenolic compound using the thin layer chromatography (TLC) method. The result indicated that the watermelon rind extract of 2.77 g of yield showed DPPH radical scavenging ability at 38.01 % and the experimental total phenolic contents (TPC) was17.36 mg GAE/100 mL. Optimization of formulation conditions was conducted using Design Expert software version 12.0.3.0, where different watermelon rind extract and mint ratios were set. pH, viscosity, and hardness were measured for all thirteen formulations before comparing them with the commercial body bar. An optimum formulation with 50 µl of watermelon rind extract and 0.5 ml of mint oil showed the best measured physicochemical properties. This best formulation presented a pH value of 4.7, a viscosity of 20.02 Pa.s, hardness of 493.17 g, while the commercial product showed a pH value of 4.9, a viscosity of 26.8 Pa.s, hardness of 520.67 g. The tested properties showed promising results where the developed massage bar in this study can be commercialized. Besides, this study proved that the formulated massage bar comprises watermelon rind extract with antioxidant properties added with peppermint oil as a cooling effect of the product. The observed results revealed that watermelon skin extract contained a substantial amount of citrulline with a significant level of retained antioxidants that do good to the body's skin. Hence, watermelon skin extract comprises a phenolic compound that can be optimistically used for massage bars as added value in the cosmetic industry. Besides, the optimized formulation of the massage bar has a pleasing appearance, good application on the skin, and excellent storage stability.

Keywords: Massage bar, watermelon rind, *Citrullus lanatus*, peppermint essential oil, Design- Expert software

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Adoption of Drone Technology among Paddy Farmers in Perlis and Kedah

Nur Izzatul Aimuni binti Yusmadi, Tengku Halimatun Sa'adiah binti T Abu Bakar*
Faculty of Agro-based Industry, Universiti Malaysia Kelantan

**Corresponding author: halimatun@umk.edu.my*

Abstract

Drone technology is critical for sustainable agricultural development. That is one of the national development goals of improving farmers, fishermen, ranchers, and agro entrepreneurs' income status. Furthermore, the Malaysian government still aims to expand innovation and modern technology to improve and increase the productivity of the agricultural sector, thereby increasing income and the country's economy. When compared to the conventional approach, it will yield better results. The new developments of automated systems using agricultural robots and drones have contributed to the agro-based market. Although some studies have found benefits of using drone technology, the number of farmers using drone technology in Malaysia is low. Fewer paddy farmers adopted drone technology due to a lack of enthusiasm and understanding about using drones including farmers' age. Therefore, this study aims to determine the adoption of drone technology among paddy farmers in Perlis and Kedah. The independent variables in this study were facilitating condition, social influence, performance expectancy, and effort expectancy. Meanwhile, the dependent variable has been the adoption of drone technology. This study used a quantitative research design, and the questionnaire was constructed based on the Unified Theory of Acceptance and Use of Technology (UTAUT). This study has used simple random sampling to choose 150 paddy farmers that have been registered under Muda Agricultural Development Authority (MADA). The data was analyzed using SPSS version 26.0, including reliability tests, descriptive, correlation, and t-test analysis. This study showed a medium mean score for the adoption of drone technology (M= 3.1895), facilitating condition (M= 3.0592), social influence (M= 2.9333), performance expectancy (M= 3.2733), and effort expectancy (M=3.1708). Findings show that the adoption of agricultural technology or farming practices, in Malaysia is still in the adaptation phase. Then, the correlation analysis results presented a significant relationship between facilitating conditions (r=0.801, p=0.000), social influence (r=0.883, p=0.000), performance expectancy (r=0.972, p=0.000), and effort expectancy (r=0.900, p=0.000) on the adoption of drone technology among paddy farmers in Perlis and Kedah. Besides that, for t-test results showed an insignificant difference between paddy farmers' age towards the adoption of drone technology in Perlis and Kedah (t=0.006, p=0. 672). Contradict to a previous study, age does not affect drone technology adoption. One of the reasons is most farmers were exposed to drone technology. MADA is one of the earliest agencies in Malaysia to emphasize the use of drones in the agricultural sector, especially for pesticide spraying work in paddy fields. Hopefully, this study can increase the adoption of drone technology among paddy farmers, especially in Perlis and Kedah. Even though it is difficult to adapt technology to

agricultural activities, it is worth it since the productivity and income of the farmers can be increased.

Keywords: Adoption, drone technology, paddy farmers, UTAUT

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Household Awareness of Recycling Food Waste as Fertilizer for Agriculture in Kelantan

Nazima Binti Mat Nawi, Tengku Halimatun Sa'adiah binti T Abu Bakar*
Faculty of Agro-based Industry, Universiti Malaysia Kelantan

**Corresponding author: halimatun@umk.edu.my*

Abstract

In the current era, we can still see the dumping of garbage and food waste dumped everywhere. Based on statistics, Kelantan is among the states that produce a relatively of garbage and food waste in high amount every day. The Kelantan government itself admits that the "Kota Bharu Bersih" campaign is still not successful to this day. If we take this problem seriously, one of the causes of high waste disposal comes from excess food. Resource-intensive food production, loss, and food waste indirectly, will contribute to various environmental effects, such as soil erosion, deforestation, water and air pollution. As economic and social and environmental problems are now seen to be on the rise, food waste is recognized as an increasingly pressing issue among governments, NGOs, academics, and the general public. Along the food production chain much involves evidence based on the amount of food waste. On average (previous record estimates of wastage around 15,000 tonnes per day), a Malaysian throw away 1.64 kilograms (kg) of food waste per day, which is higher than the world average of 1.2 kg per day. From an economic perspective, food wastage means wastage the use of economic resources such as water and fuel as well as contributing to carbon dioxide emissions. The problem of food waste disposal needs to be resolved so that the country continues to be under control. For example, the amount of food waste and garbage is thrown away every day is high. Landfills will be congested and accumulate increasing garbage. Therefore, this study will be conducted to identify the level of awareness of households in Kelantan about food waste that can be recycled into fertilizer in agriculture. This study uses a method based on random probability sampling. The sample size of the study was 150 respondents. Questionnaires were distributed online as a medium to measure the level of knowledge and practices of households in the study area. The study also uses demographic factors such as age, occupation and level of education that can influence the level of household awareness in the disposal of food waste that can still be recycled for use as fertilizer in agriculture. The independent variables in this study were knowledge, attitudes, subjective norms and behavioral control while the dependent variable was awareness of recyclable food waste. A quantitative research design was used, and questionnaires were compiled based on the Theory of Planned Behavior (TPB). The findings showed that the high scores were recorded for household awareness of food waste recycling (M =4.46), attitudes (M = 3.91), subjective norms (M = 3.63), and perceived behaviors (M = 3.68). In general, there was a significant relationship between attitudes (r=0.329, p=0.000), and behavioral controls (r=0.395, p=0.000) with household awareness of food waste recycling. However, subjective norms (r=0.278, p=0.001) are not significant with awareness of food waste recycling. Contradict with the previous study, that mentions subjective norm is the main

factor that affects awareness. Findings have proved that most of the households in Kelantan believe that recycling food waste is important and not difficult to do at home. In the future, this study hope will increase the awareness of household on recycling food waste as potential to be compost that can be used in agriculture to produce fresher and more fertile crops.

Keywords: food waste, recycling, household, TPB

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Safety and Health Awareness in the Workplace among Oil Palm Plantation Workers

Nurul Ain binti Zainudin, Tengku Halimatun Sa'adiah binti T Abu Bakar*
Faculty of Agro-based Industry, Universiti Malaysia Kelantan

*Corresponding author: halimatun@umk.edu.my

Abstract

Malaysia's agriculture sector is the third most important industry in the country's economy. The oil palm plantation field is the biggest and most significant contributor to GDP in the agricultural industry (GDP). Malaysia is widely recognized as the world's second-largest producer and exporter of palm oil, after Indonesia. Oil palm plantations are important because they are at the beginning of the value chain and provide palm oil mills with raw materials required by the oil palm industry and other sectors. Agriculture ranks among the most hazardous jobs. Farmers are at risk for fatal and nonfatal injuries, work-related lung disease, noise-induced hearing loss, skin diseases, and certain cancers associated with chemical use and prolonged sun exposure. Farming is one of the few works in which the families who often share the work and live on the premises are also at risk for injuries, illness and death. Based on statistics, the total of occupational accident in the agriculture sector in Malaysia is 979 which are the second highest behind the manufacturing sector (Wahab, 2021). Even though the manufacturing sector is the highest but safety issues in the workplace need to be emphasized. Besides, awareness of safety and health in the agriculture sector is moderate level. This issue occurs due to workers' lack of safety knowledge and the unavailability of proper safety training is a reminder that the accident rates among them will increase. Even though it is moderate, safety and health issues in the workplace need to emphasize and the employment sector plays a very important role in the development and progress of the country. While to retain this issue from rising, we need to produce a professional and skilled workforce to ensure that the industry continues to develop and grow rapidly. Therefore, this study aims to identify safety and health awareness in the workplace among oil palm plantation workers. The independent variables in this study will be attitudes, subjective norms, behavioural control, knowledge, and practices. While the dependent variable is the safety and health awareness of workers in oil palm plantations. A quantitative research design will be used, and the questionnaire will be adapted based on the Theory of Planned Behaviour (TPB) and KAP model. Simple-Random Sampling will be employed to select 180 oil palm plantation workers. SPSS version 26.0 will be used to analyze reliability tests, and descriptive and correlation analysis. Based on the result, awareness of safety and health in the workplace among oil palm plantation workers is high (M= 4.4275, SD= 0.64054). Findings for all independent variables show a high mean score with results for attitude (M= 4.3867, SD= 0.64153), subjective norm (M= 4.2489, SD= 0.61652), perceived behaviour (M= 4.1652, SD= 0.69140), practices (M= 4.2375, SD= 0.62772) and knowledge (M= 2.8289, SD= 0.27236) have a high mean score. Results also show that there is a significant relationship between attitudes (p= 0.848, r= 0.000), subjective norms (p=0.721,

r= 0.000), perceived behavioral control (p=0.385, r= 0.000), practices (p= 0.529, r= 0.000), and knowledge (p= 0.616, r= 0.000) of safety and health awareness in the workplace among oil palm plantation workers. This demonstrates that plantation in Malaysia that was long-established have a complete standard of procedure (SOP) for occupational safety and health-giving high awareness among their workers. Hopefully, this study will increase the awareness of workers in oil palm plantations on safety and health issues although it is difficult to apply in employment, it will help improve the quality of labour and high workers.

Keywords: Safety and health awareness, oil palm plantation, TPB, KAP model

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Detection of Mycorrhizae from *Kayu Bawang* (*Azadirachta indica*) in Lowland and Highland Ecosystems using Biomolecular Approach

Cimbyo Layas Ketaren[1*], Guswarni Anwar[1], Sipriyadi[2]
[1]Department of Forestry, Faculty of Agriculture, University of Bengkulu
[2]Department of Biology, Faculty of Mathematics and Natural Sciences, University of Bengkulu
Jl. W.R. Supratman, Kandang Limun, Bengkulu 38371, Indonesia

**Corresponding author*: layascimbyo@gmail.com

Abstract

Arbuscular mycorrhizal fungi (AMF) are a group of rhizosphere microorganisms that are capable of forming a symbiosis with more than 80% of plant species, which indicates the complexity of the origin, evolution, and diversification of this group. Mycorrhiza is the mutualism of fungi and plant roots which has a role in the elongation of plant roots, thereby increasing nutrient and water uptake. Mycorrhiza is also associated with the *kayu bawang* tree, which is one of the local types of superior wood-producing trees that are widely used as building materials and furniture. This study aimed to determine the types of mycorrhizae associated with the roots of the *kayu bawang* trees using a biomolecular approach and to examine the specific conditions of mycorrhizal habitats in the *kayu bawang* trees. We collected roots of *kayu bawang* samples from two locations representing different elevations: Kertapati Village at ± 63 meters asl (lowland) and Pal Delapan Village at ± 959 meters asl (highland). It was carried out by choosing 4 angles with a distance of 50 cm at each angle calculated from the sample tree with a depth of 20-30 cm into the soil. The sample was washed and then mashed with the help of Liquid Nitrogen. Identification of fungi species was carried out using a DNA isolation kit following the protocol, then amplified through *polymerase chain reaction* (PCR) using forward primer ITS5.8S and reverse ITS4. DNA sequencing was carried out using the single *pass sanger method*. The resulting sequences were then compared with the *GenBank* database at NCBI using the BLAST method and then compiled into a phylogenetic tree using MEGA 11 software. The environmental conditions were also recorded such as temperature, air humidity, light intensity, altitude, slope, and rainfall. The preliminary findings suggested that there were 10 species of AMF associated with the kayu bawang trees: *Psathyrella sp, Mycena sp, Filoboletus manipularis, Mycena amicta, Tricholomataceae sp, Agaricales sp, Mycena pura, Mycena rosea, Mycena citrinomarginata, Favolaschia manipularis*. As for environmental factors in Kertapati Village, the results were as follows: light intensity (1374 Lux), temperature (34.3°C), humidity (45.2%), slope (52.9%), rainfall (53.38 mm^2), and soil pH (4.8) while in Pal Delapan Village were light intensity (937 Lux), temperature (28.1°C), humidity (62.7%), slope (6.8%), rainfall (338.69 mm^2), and soil Ph (4.73).

Keywords: *Kayu bawang*, Arbuscular Mycorrhizal Fungi (AMF), polymerase chain reaction (PCR)

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Proportion of Length Fiber on Wood Acacia Mangium (*Acacia mangium* Willd) as Raw Material for Pulp and Paper

Winda Nur Anisa, Ridwan Yahya
Department of Forestry, Faculty of Agriculture, University of Bengkulu
Jl. W.R. Supratman, Kandang Limun, Bengkulu, 38371

**Corresponding author*:

Abstract

In the Asian region, Indonesia is recorded occupy rating 3rd as pulp producer and rating 4th for producer paper. Type frequent wood used as ingredient raw pulping is of the genus *Acacia* and *Eucalyptus.* Mangium (Acacia *mangium* Willd) is type native Indonesian. Type this grow good on fertile land, fertile land erosion and soil used farming. One factors that can made criteria in determine standard appropriateness ingredient pulp raw material, that is dimensions fiber. There are several parameters measured in skeleton analysis ingredient pulp raw, wrong the only one is length fiber. Length fiber take effect to nature strength paper. Study this aim for knowing length fiber acacia mangium, knowing variation size fiber short and knowing proportion fiber short based on its position inside stem mangium from pith to near floem.

Separation fiber on wood mangium conducted with maceration method, then length fiber observed use microscope. Based on results studies measuring 600 fibers by random on every beam wood close researched floem obtained long average result fiber mangium is 934 µm. Size classified fibershort on mangium that is in the range of 701.95 – 726.09 µm.

Keywords:

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Bird Species Richness in the Collaborative Working Area of Bukit Barisan Selatan National Park and Tambling Wildlife Nature Conservation (TWNC)

Adi Kuswanto, Agus Susatya, Hery Suhartoyo
Department of Forestry, Faculty of Agriculture, University of Bengkulu
Jl. W.R. Supratman, Kandang Limun, Bengkulu 38371

**Corresponding author*: adikhus@gmail.com

Abstract

Bird is one of the sensitive faunas toward habitat change. Bukit Barisan Selatan National Park (BBSNP) develops partnerships with relevant stakeholders to manage their conservation areas for multi-activities. It is also one of the Bird Important Areas (BIA) in Sumatera as quoted by Birdlife International. Tambling Wildlife Nature Conservation (TWNC) has collaborated with BBSNP to manage their south region for community development, safeguarding regions, Sumatran tiger rehabilitation, and ecotourism development. However, people's activity and recent forest land use leading to habitat change may potentially affect the bird population at the site. The purpose of this research was to assess the bird species richness and relative abundances in the collaboration working area of TWNC. Three locations representing different forest land uses were determined for observation. The sampling method used was point count by following the transect with a length of one kilometer, in which two transects for each location. The interval between point counts was 200 meters and the radius of observation was 30 meters. Four repetitions were done for each location. Data analysis employed Species Discovery Curves to obtain species richness and Time Species Counts to gain a relative abundance of species in ranking scores. The Species Discovery Curves showed that enclave habitats have species richness lower than two others. However, three habitats possibly encounter new species if more observation effort was performed. The Time Species Counts suggested that the top scores of relative species abundance in forest habitat were *Treron bicinctus* and *Pycnonotus goiavier* while *Pycnonotus aurigaster* and *Merops viridis* were the highest in the enclave and *Prinia familiaris* and *Hirundo tahitica* in ecotourism support habitat. Forest and support ecotourism habitats were considered to have good suitability in accordance with their designation. Nonetheless, further studies on bird surveys with better approaches and methods need to be conducted.

Keywords: Bird community, collaboration area, Species Discovery Curves, Tambling Wildlife Nature Conservation, Time Species Counts

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The Potential and Utilization of Several Plants as Phytoremediation Agents for Acid Mine Drainage in Coal Mining

Barkah Yanuar Damar Dani, Guswarni Anwar, Agung Hasan Lukman
Department of Forestry, Faculty of Agriculture, University of Bengkulu
Jl. W.R. Supratman, Kandang Limun, Bengkulu 38371

**Corresponding author*: barkahdani79@gmail.com

Abstract

Mining waste materials can affect the living environment. The impact of the coal mining process is the emergence of giant pits in ex-mining excavations causing ponds of mine water. Mine ponds will form when the rainy season arrives. During the rainy season, soil stripping and other former mining activities will be dissolved in it. This is what makes the water in the former coal mines acidic. Acid mining water comes from mine drainage which can pollute water bodies if it is not managed and controlled properly. Moreover, stagnant water in ex-mining holes can affect the quality of the surrounding environment. Previous research reported that mine water contains TSS (*Total Suspended Solid*), Fe (Ferrum), and Mn (Manganese), and the pH of the water exceeds the quality standard for liquid waste from coal mining. So far, the handling of mine water is by using quicklime and dolomite lime, but this activity is considered inefficient and costs a lot of money. Phytoremediation is a process of absorbing harmful contaminants with the help of plants as an agent. Plants have the potential to reduce metal content (Fe, Mn, and Cd) in water, stabilize water pH, and reduce the percentage of TSS, BOD (*Biological Oxygen Demand*), and COD (*Chemical Oxygen Demand*) in water. This article aims to examine the potential and utilization of plants in phytoremediation activities for mining water. According to several studies that have been reviewed, there are several plants that have been used in the phytoremediation process, including *eceng gondok* (*Eichhornia crassipes*) which can reduce Mn levels by 72%, *kayu apu* (*Pistia stratiotes*) reduces Fe levels by 77-98% and Mn by 55 %, *purun tikus* (*Eleocharis dulcis*) reduced Fe levels by 70%, *ekor kucing* (*Acalypha hispida)* reduced Fe and Mn levels by 86.5% and 40.1%, and *kangkung air* (*Ipomoea aquatica* Forsk) lowers the pH of the water by 53%. Despite their effectiveness, phytoremediation has also some drawbacks in terms of the long process. Thus, it needs to be considered comprehensively and aligned to the objectives to get optimal results.

Keywords: Acid mine drainage, bio-accumulator, coal mining, phytoremediation, toxic materials

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The Relationship between Precipitation and the Growth and Anatomy Structure of *Sungkai* Wood (*Peronema Canescens* Jack) in the University of Bengkulu Area

Desi Hartati Telaumbanua, Putranto B.A.N, Nani Nuriyatin
Department of Forestry, Faculty of Agriculture, University of Bengkulu
Jl. W.R. Supratman, Kandang Limun, Bengkulu 38371

**Corresponding author*: desihartati812@gmail.com

Abstract

Rainfall is one of the key factors affecting the process of tree growth rings. The growth ring is a circle of concentration due to secondary growth that appears in layers resulting from the alternation of environmental conditions. The growth ring is closely related to the wood anatomy structure. Wood anatomy can also be used as an indicator of a certain climate that occurred in the past. The relationship of rainfall with the trees' growth ring in the tropics remains unresolved since the tropics have relatively similar seasons throughout the year. There is a lack of study on how *sungkai* wood growth relates to rainfall. Therefore, this study aimed to determine the relationship of rainfall to the growth ring width, pore diameter, and fiber dimensions in *Sungkai* wood (*Peronema canescens* Jack) in the University of Bengkulu area. The determination of the growth ring used dendrochronological and cross-dating methods. The pore diameter measurement was carried out by measuring the longest and the shortest pore. Fiber dimension measurements were conducted by measuring the length and the diameter of the fiber, the diameter of the lumen, and the thickness of the fiber wall. We performed maceration to obtain the fiber. The rainfall data used was from the last two decades from 2001 to 2020. This study showed that the relationship of rainfall with the growth of the growth ring width of *sungkai* wood was not significant. Similarly, it was also observed for the pore diameter, except for the diameter of the latewood pore. The pore diameter of the latewood has a significant negative correlation to dry months with a value of r=-0.45. It means that if the dry month is high, the pore diameter of the latewood will be smaller and vice versa. The relationship of precipitation with the fiber dimensions also showed no significant results, except in the lumen diameter of the fibers in the latewood which had a strong correlation value (r=0.44) indicating that if the number of rainy days increases, the diameter of the lumen will be larger. This study concluded that the relationship between rainfall and growth ring width, pore diameter, and fiber dimension on *sungkai* wood was not significant. Further studies are needed to assess other factors affecting tree growth rings for such species.

Keywords: *Sungkai* wood, growth ring, pore diameter, fiber dimensions

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The Characteristics of Microscopic Anatomical Structural of Earlywood and Latewood in Several Growth Rings of Cross Sections of *Pelangas* Wood (*Aporosa aurita* Miq.)

Dina Nurul Komaryah, Nani Nuriyatin, Agus Susatya
Department of Forestry, Faculty of Agriculture, University of Bengkulu
Jl. W.R. Supratman, Kandang Limun, Bengkulu 38371

**Corresponding author*: dnurulkomaryah@gmail.com

Abstract

Indonesia's forests have approximately 4000 important timber species. Around 400 species in 198 genera of 68 families are widely known in the trading. However, the lack of knowledge in distinguishing wood types is caused by human limitations in knowing the characteristics of the wood itself. Activities that occur in the cambium cause plant stems to enlarge and leave a growth ring. Earlywood is the wood formed at the beginning of the growth period that has large tracheid cells and low density. On the other hand, the latewood is formed at the end of the growth period which has small tracheid cells and high density. The purpose of this study was to determine the characteristics of the microscopic anatomical structure of early and late wood in the growth ring on a cross-section of *pelangas* wood (*Aporosa aurita* Miq.): diameter and pore density, radius, parenchyma and fiber dimensions. The method used was to estimate the growth ring using dendrochronology. Measurement diameter and density of pores, radius, and parenchyma were carried out by the method of making a certain area on the wood surface and estimating the diameter and density of pores, radius, and parenchyma formed in that area. Measurement of fiber dimensions in the form of fiber length, lumen diameter, fiber diameter and fiber wall thickness is carried out by making maceration or separation of wood fibers. To date, the previous research carried out have not yet examined such parameters in the genus Aporosa. However, on other parameters, several studies have stated that the genus Aporosa has an unclear tree growth ring and the vascular vessels are 1000-2000µm long. Other studies also reported that wood parenchyma usually spreads in aggregates and small irregular bands in strands of 3-8 cells. Therefore, it is expected that the results of this research can contribute to the current knowledge on Aporosa's anatomy structure and growth rings.

Keywords: Growth ring, microscopic structure, *Pelangas* wood, pore density, fiber dimension

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Shelf Life Prediction of Crystalline Coconut Sugar in Vacuum Packaging with Arrhenius Approach

N. S. Nuroniah[1]*, K. Syska[1], Ropiudin [2]
[1]Food Technology Study Program, Faculty of Science and Technology, University of Nahdlatul Ulama Purwokerto, Jl. Sultan Agung No. 42, Karangklesem, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 54231
[2]Agricultural Engineering Study Program, Department of Agricultural Technology, Faculty of Agriculture, Jenderal Soedirman University, Jl. Dr. Soeparno No. 63, Karangwangkal, Purwokerto, Banyumas Regency, Central Java Province, INDONESIA 53122

**Corresponding author: nitasaniah6@gmail.com*

Abstract

Moisture content is an important parameter that can determine product quality. Changes in water content in food products can cause various damages such as the presence of fungi and bacteria, hardening, softening or clumping, especially in dry food products. Storage of crystalline coconut sugar by vacuum packaging is an effort to inhibit the absorption of moisture from the environment so as to extend its shelf life. The shelf life of food products can be estimated and then the expiration time is determined using the Accelerated Shelf-life Testing (ASLT) method. The right method to describe the effect of temperature on the rate of product deterioration is the Arrhenius method or approach. The aims of this study were: (1) to examine the effect of storage and packaging temperature on several quality parameters of crystalline coconut sugar in vacuum packaging. (2) developed the Arrhenius Model to estimate the shelf life of crystalline coconut sugar in vacuum packaging. The place of research was carried out at the Integrated Science Laboratory, Nahdlatul Ulama University, Purwokerto. The research was carried out in February - July 2022.

The material used in this study was crystalline coconut sugar obtained from the Banyumas area, Central Java. The packaging used in this study included polyethylene (PE), vacuum packs and aluminum foil. The tools used to support the research are rotary rack dryer, digital scale, thermometer, and heat vacuum sealer. In this study, two factors were used, namely the type of packaging and storage temperature. The types of packaging used are PE (P1), vacuum packaging (P2), and aluminum foil (P3). Then stored at various temperatures, namely 5 (T1) and 30°C (T2). Changes in the weight of crystalline coconut sugar in some of the packages used, namely, polyethylene (PE) packaging, vacuum packaging, and aluminum foil packaging. The weight of crystalline coconut sugar on polyethylene (PE) packaging at a temperature of 30°C there was an increase in weight starting from the 3rd week (0.1), 4th week (0.13), 5th week (0.15), and at 15°C. there was weight gain starting from the 3rd week (0.12), the 4th week (0.12) and the 5th week (0.22). The weight of crystalline coconut sugar during storage in vacuum packs (vacuum pack) at a temperature of 30°C, there was an increase in weight starting from the 3rd week (0.17), 4th week (0.19), 5th week (0.26), and at room temperature. 15°C there was a reduction in weight from week 1 (0.16), week 2 (0.16), week 3 (0.34), week 4 (0.23). The

linear regression equation from the plots of ln k and 1/T on changes in weight parameters (mass) of crystalline coconut sugar with a temperature of 15°C on PE packaging, namely y = -7.8275x + 7.831 with a value of R^2 = 1, for vacuum packaging the linear regression equation is y = -9.5705x + 9.574 with a value of R^2 = 1, and for packaging aluminum foil linear regression equation is y = -8.5207x + 8.5241 with a value of R^2 = 1. The conclusions in this study are: (1) the best storage temperature and packaging of crystalline coconut sugar using aluminum foil packaging at a temperature of 15ºC, with weight gain values starting from the 2nd week (0.01), 3rd week (0.05), week 3 -4 (0.10), and 5th week (0.20). (2) the shelf life of crystalline coconut sugar stored at 15°C using aluminum foil packaging is longer at 7697 days, while the shortest shelf life is stored at 30°C using PE packaging, which is 1160 days. (3) based on the results of the hedonic test, storage and packaging temperatures have a significant effect on PE packaging and vacuum packaging.

Keywords: shelf life, prediction, crystal coconut sugar, vacuum packaging, arrhenius approach

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Growth Response of Two Varieties of Soybean (*Glycine max* Merril.) to Drought Stress on Nutrition Culture Media

Ikmal Aziz*, Marulak Simarmata, and Wuri Prameswari
University of Bengkulu

**Corresponding author*: ikmalaziz280700@gmail.com

Abstract

Soybean is one of Indonesia's strategic food crop commodities, whose needs continue to increase in line with population growth. Soybean also has high nutritional value and has the potential to be developed as a functional food. However, soybean production has not been able to meet the demand. Utilization of marginal land, including dry land, is one of the strategies to increase soybean production in Indonesia. The obstacles faced in soybean cultivation in dry land are drought stress which can affect plant morphology, anatomy, and physiology. This study aims to determine the growth response and tolerance level of two soybean varieties to drought stress (PEG 6000). This research was conducted from March to June 2022 in the Greenhouse of the Agronomy Laboratory, Department of Agricultural Cultivation, Bengkulu University. This study used a completely randomized design (CRD) with two treatment factors and was repeated three times. The first factor was the soybean variety, which consisted of two treatment levels: the Gepak Kuning and Dering 1 varieties. In comparison, the second factor was the concentration of drought stress (PEG 6000) which consisted of three treatment levels, namely the concentration of 0%, 10%, and 20%.

The results showed that the interaction between varieties with PEG 6000 significantly affected the variables of fresh crown weight, fresh root weight, shoot dry weight, root dry weight at 15 days after treatment (HSP), lateral root length at five days after treatment, leaf greenness level. 0 days after treatment, and had a significant effect between varieties on plant height variables, fresh root weight, root dry weight at 0, 5, and 10 days after treatment, the number of leaves at 5 and 15 days after treatment, shoot fresh weight at 5, 10, and 15 days after treatment, shoot dry weight at 10 and 15 days after treatment, stomata density at 5 and 10 days after treatment.Furthermore, the significant effect between stresses on plant height variables at five days after treatment, leaf number and leaf greenness at ten days after treatment, fresh shoot weight and fresh root weight at 5, 10, and 15 days after treatment, primary root length at 0 days after treatment, lateral root length and stomatal density at 15 days after treatment, shoot dry weight at 5 and 10 days after treatment, root dry weight at 5 and 15 days after treatment. The response of the Gepak Kuning variety to drought stress (PEG 6000 10%) was medium and Ring 1 was tolerant, while in drought stress (PEG 6000 20%), Gepak Kuning was sensitive while Ring 1 remained tolerant. During 1 is a tolerant variety, while Gepak Kuning is a variety sensitive to drought stress.

Keywords: abiotic stress, soybean, drought, PEG 6000

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Rumination Behavior of Pre-Weaned Nubian Goats Fed with Legume and Different Levels of *Azolla microphylla*

Joyce Octhaviolina Turnip[1*], Erma Ide Elismawati[1], Jepri Susanto[1], Nurmeiliasari[1], Amir H. K. Amrullah[1], J. Firison[2], H. Kusnadi[2]
[1]Department of Animal Science, Faculty of Agriculture, University of Bengkulu
[2]National Research and Innovation Agency

**Corresponding author*: joyceturnip@gmail.com

Abstract

A young goat consumes only milk during its first month of life, which is later introduced to forage and solid diets. The dietary transition causes dramatic alteration that affects the eating behavior of the goats. Studies on eating behavior showed feeding forages initiates rumination activity in young goats. As rumen develops, the rumination time increases. A transition from a liquid diet in a non-rumination phase to forage-based diets in the rumination phase is clearly observed in the eating behavior study. The rumen of pre-weaned Nubian goats undergoes changes in volume and function. Feeding with crude fiber and high nutrients can stimulate maximum rumen growth and development. Azolla microphylla is a potential diet to support changes during this transition period. Chemical composition of Azolla microphylla consists of 89.73% dry matter, 75.73 – 82.66% organic matter, 22.84 – 35.49% crude protein, 14.7% crude fiber, 3.7 – 4.5% ether 17, 34 – 24.26% ash, 1.64 – 2.58% calcium, 0.26 – 0.34% phosphate, 2.71% potassium, 54.85% neutral detergent fiber, 36.57% acid detergent fiber, vitamins B, B12, and beta carotene. The nutritional value of *Azolla microphylla* along with *Indigofera zolingeriana* is expected to stimulate growth and rumen development of pre-weaned Nubian goats. Feeding behaviour depicts the rumen development of pre-weaned goats. The development of the rumen might be indicated by increases in duration, percentage and frequency of rumination in pre-weaned Nubian goats.

This study aims to evaluate the rumination behavior of pre-weaned Nubian goats given *I. zolingeriana* and pellets containing different levels of *A. microphylla*. The study was conducted in April 2022 at the Baptist Agricultural Development Institute (LPPB) for 32 days starting March 13-14 April 2022 with data collection for 1 week at the end of the study. The material used was 15 Nubian goats aged 3 months with an average body weight of 13.50 kg. The study used a completely randomized design (CRD) method with 3 treatments and 5 replications, each replication using 1 goat. The treatments were P0=Control, P1=50% *A. microphylla* + 20% milled corn + 25% bran + 5% molasses and P2=75% *A. microphylla* + 10% milled corn + 10% bran + 5% molasses. The main feed given is *I. zollingeriana* 1.5 kg/head/day, pellets 150 g/head/day and milk 0.7 liters/head/day. The variables observed were eating behavior, rumination, standing and resting. The data is classified as duration, percentage and frequency of each variable. The results showed that the highest average duration of rumination was P2 (191.24±1.97) and the lowest was P0(187.47±2.24), the highest percentage was P2(35.41±0.37) and the lowest is

P0(34,72±0.41), and the highest frequency is P0(25.11±2.32) and the lowest is P2(19.05±1.23). The data were analyzed using uniformity analysis (ANOVA). Feeding pellet showed that the pellet *A. microphylla* had no effect significantly on the percentage and duration of eating, rumination, and rest. But it had a significant effect on the percentage and duration of standing, where P0 was not significantly different from P1 (P>0.05) but significantly different from P2 (P<0.05). However, giving pellet *A. microphylla* significantly affects the frequency of eating, rumination, standing and rest. Where P0 is not significantly different from P1(P>0.05), but significantly different from P2 (P<0.05). From the results of this study, it can be concluded that the administration of *A. microphylla* pellets did not significantly affect the duration and percentage of feeding, rumination and rest. However, it had a significant effect on the duration and percentage of standing and feeding frequency, standing rumination and rest in pre-weaned Nubian dairy goats.

Keywords: Rumination behavior, *Azolla microphylla*, Nubian

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The Effect of Using Black Soldier Fly (BSF) Maggot Flour (*Hermetia illucens*) in Ration on Broiler Performance

Choirul Fajri*, Yosi Fenita, Nurmeiliasari
Department of Animal Science, Faculty of Agriculture, University of Bengkulu

**Corresponding author*: choirul.ptr18@gmail.com

Abstract

Feed availability very much determines the livestock business. Dietary sources to feed livestock are expensive because most diets are also human's diets. Feed costs reach 60-70% of production costs, so the feed influences production costs. The feed must contain nutrients livestock needs in sufficient quantities for production needs (Sandy *et al.,* 2016). So far, protein sources still use concentrates. One of the most widely used concentrates is broiler concentrate (KBR). The higher the need for feed, the higher the need for concentrate as a source of protein. So there must be an alternative feed source with almost the same protein content as a concentrate so that it can be used as a substitute for protein sources in feed ingredients. To overcome all this, one of the feed ingredients that is thought to be able to replace concentrates and is easily obtained, especially in poultry rations, is *Black Soldier Fly* (BSF) maggot flour (*Hermetia illucens*). In addition to having high nutrition, Maggot BSF (*H. illucens)* also has a good nutritional mass as a poultry feed ingredient. Maggot BSF (*H. illucens)* can convert organic matter into biomass. Maggot BFS has the advantage that it can be produced in various sizes according to needs.

BSF maggots have storage organs called *trophocytes*, which store the nutrient content in the culture media they eat (Fahmi *et al*., 2009). According to Veldkamp *et al*. (2012), the amino acid profile in BSF maggot flour is similar to soybean flour, especially the content of methionine and cystine, which are essential amino acids for the growth of pigs and broilers. The provision of BSF maggot flour in the ration will meet the needs of these amino acids. This study aims to evaluate the effect of BSF maggot flour (*H. illucens*) in rations on broiler performance. This research was conducted from March to April 2022 in broiler cages *Commercial Zone and Animal Laboratory* (CZAL) Department of Animal Husbandry, Faculty of Agriculture, Bengkulu University. This study used 160 broilers aged 14 days. The design used was completely randomized (CRD) with four treatments, five replications, and each replication using eight broilers. The treatments given were P0: The use of 0% Maggot BSF Flour; P1: Use of 7% BSF Maggot Flour; P2: Use of 9% BSF Maggot Flour; and P3: Use of 11% Maggot BSF Flour. The variables observed were ration consumption, weight gain, final body weight, and ration conversion.

The data obtained were then analyzed by ANOVA. The results of the analysis of variance (ANOVA) showed that the average ration consumption at P0, P1, P2, and P3 were respectively (1982.00 grams/head), (2071.46 grams/head), (2114.29 grams/head). tail), and (2063.39 gram/head). The average final body weight of P0, P1, P2, and P3 were (1402.61 grams/head), (1437.41 grams/head), (1420.31 grams/head), and (1406.09

grams, respectively). The average weight gain at P0, P1, P2, and P3 were (923.86 grams/head), (961.46 grams/head), (944.08 grams/head), and (928, respectively). The average ration conversion at P0, P1, P2, and P3 were (2.15), (2.16), (2.25), and (2.23). The results showed that the use of BSF maggot flour (*H. illucens*) in rations up to 11% had no significant effect (P>0.05) on ration consumption, final body weight, weight gain, and ration conversion.

Keywords: broiler, BSF maggot flour, performance

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Formulation of Poultry Feed with Supplementation Protein content from *Trichanthera gigantea* and *Morus alba* Leave Meal for Japanese quail (*Cortunix japonica*)

Nur Atika Husna Kamal Mohamed[1], Suniza Anis Mohamad Sukri[1*], Yusrina Andu[2], Hasnita Che Harun[1], Mohammad Mijanur Rahman[1]

[1] Department of Agricultural Science, Faculty of Agro-Based Industry, Universiti Malaysia Kelantan, Kelantan, Malaysia

[2] Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA, Negeri Sembilan, Malaysia

**Corresponding author: suniza@umk.ediu.my*

Abstract

The poultry industry in Malaysia is a major source of meat protein. The most important cost involved in producing poultry is feed, especially the protein source element. Because feed contribute about 60 to 70% of total production costs, any effort to reduce feed costs will result in a significant reduction in total feed production costs. This quail formulation diet included four main ingredients: Madre de aqua leaves meal, Mulberry leaves meal, rice bran, and fish meal as a protein source. Fresh leaves of Madre de aqua and mulberry have been separated from the stem and were dried at 60 ℃ for 24 h before being crushed and powdered to form a meal. Rice bran, vitamin and mineral premix, broken rice, palm oil, limestone salt, and methionine have all been combined with the four primary ingredients, Madre de agua leaves meal, mulberry leaves meal, fish meal, and rice bran. In this study, the optimal protein content (%) will be determined by performing an optimization analysis using Design Expert Software Version 7.1 through Central Composite Design (CCD), a statistical tool. The goal is to identify the best protein source ingredient and formulation for *Cartunix japonica* japanese quail's diet. For leaves meal (Madre de agua leaves meal and mulberry leaves meal), rice bran and fish meal, the recommended optimum values were 29.5 %, 27.5 % and 19.5 % respectively. This led to an ideal protein level for mulberry leaf meal inclusion of 27.012 % compare to Madre de aqua leaves meal with 26.27 %. In the future, the poultry business may have the option of creating quail feed using leaves meal. In addition to being affordable, leaves meals have a significant possibility of replacing costly and imported components in the feed industry.

Keywords: Protein source, Madre de agua leaves meal, Mulberry leaves meal, Central Composite Design (CCD), quail feed

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

The Quality of Durian Peel Fermented Waste Product as High-Quality Animal Feed Source

Sareena Semae*, Nurhafizi Chepo, Muhammad Ikram
Animal Science Program, Faculty of Agriculture, Princess of Naradhiwas University

**Corresponding author:* sesemae@hotmail.com

Abstract

The durian peel waste product was value added as a high-quality animal feed source in the southern border province of Thailand. This study aimed at the effect of different additives on the quality of fermented durian peel under a completely randomized design (CRD). There were three additives viz. yeast, salt, and sodium nitrate used at 1 % of each that fermented for 21 days in a 20 liters tank. The durian peel fermented was assessed for its physical and chemical compositions. The results showed that all three groups of durian peel fermented were in good condition and can used for animal feed following the report of fermented physical standards. All groups of fermented durian peels have a scent like pickled fruit incorruptible, with no rotten smell, texture, not mucus, and not messy. The difference additive added to the durian peel fermented did not change the pH level which was 3.59 - 5.89 ($P > 0.05$).

The color of durian peel fermented with 1% salt was olive yellow that better quality (L=35.85 and a=18.65) than sodium nitrates and yeast. The characteristics of durian peel fermented with 1% yeast; the color was red dark than other recipes. The smell of durian rind fermented with yeast, salt, and sodium nitrate has a rather aromatic smell like the smell of pickled foods, a slightly acidic and aromatic aroma. Hydrocyanide was found in all formulas of fermented durian rinds but was not significantly different ($P>0.05$) (0.32-0.98 mg%) and the levels did not affect animal health. The levels of OM, DM, ash, and ADF were similar in all groups. However, yeast added to durian peel fermented was significantly ($P<0.05$) higher protein levels (22.28%) than salt (18.22%) and sodium nitrate (15.32%), respectively. But yeast added to durian peel fermented was significantly ($P<0.05$) higher NDF levels than salt and sodium nitrate. In addition, the hydrocyanide levels during 0.33-0.47 mg%, which are levels that are not harmful to health. Considering the cost of fermentation found that the 1% salt added had lower (1.45 baht/kg) than the others. In addition, the study can conclude that durian peel fermented with 1% salt is appropriate to bring for ruminant feeding because they have appropriate nutritional values and low cost for the fermentation step. Also, being used to replace grass during the shortage, is a way to reduce the feed cost production in raising goats, especially roughage sources when the production cost reduction makes more profit.

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Effects Of Kurdistan Chamomile Flower Supplementation on Broiler Chicken Performance

Alan O. Abdullah, Dekan A. Abdulkarim, Salar S. Ali, Mohammad A. Hassan, Hardi Ahmed Karim AL-JAF*
University of Garmian, Iraq

**Corresponding author*: hardy.ahmad@garmian.edu.krd

Abstract

This study was conducted to determine the effects of Kurdistan Chamomile Flower supplementation on broiler chicken performance. Three hundred, one-day-old Ross 308 broiler chicks were obtained from Kazewa Hatchery in Kalar and were randomly distributed into four treatment groups (75 chicks for each group) with three replicates (each 25 chicks). Chicks were raised on battery cage (H-type Broiler Chicken Battery Cage System) that consist three floor and area of each cage (120 × 100 × 90 cm). T1 (Feed with 0 mg/kg Kurdistan Chamomile Flower), T2 (Feed with 200 mg/kg Kurdistan Chamomile Flower), T3 (Feed with 300 mg/kg Kurdistan Chamomile Flower) and T4 (Feed with 400 mg/kg Kurdistan Chamomile Flower) experiment groups were constituted. In the study, the effects of the treatments on the performance parameters were found to be statistically significant. In body weight, the highest group in terms of total body weight gain was T4, and it was significantly higher than T2 and T3 groups ($p<0.001$). In total, the feed conversion rate (FCR) was found to be statistically significant. While T4 had a similar FCR (1.50) to the control group, it was significantly lower ($p<0.001$) compared to T2 and T3 (1.167). The inclusion of Kurdistan Chamomile Flower at level of 400 mg/kg diet improves broiler performance and Live body weight and Feed conversation ratio.

Keywords: Broiler, feed conversion rate, live weight gain, performance, Chamomile Flower

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Effect of Different Flooring Systems on The Broilers Performance

Hana A. Mohammed, Kozhin A. Maruff, Hazhan G. Xafur, Ahmed I. Mohammed*
University of Garmian, Iraq

*Corresponding author: ahmed.ismael@garmian.edu.krd

Abstract

This study was made to investigate the effects of different floor systems (litter floor (wood shaving) and cages) on the broiler performance. The experiment was performed on 72-one day-old Ross 308 chickens, Birds were divided randomly into two separate rooms (two groups each 36 birds, with 3 replicates of 12 birds). with identical conditions until 35 days of age. The results revealed a highly significant body weight ($P < 0.05$) in the week (2,3,4and 5) in broilers that were raised in battery cages than broilers raised on litter also body weight gain also, the broilers raised in battery cages a significantly ($P < 0.05$) had higher body weight gain at dissection (weeks 2 and 4) compared to commonly littered floors. as well as, the results showed that the feed intake at weeks (1and 2) was significantly greater ($P < 0.05$) for broiler that raised in cages than broilers raised on litter then feed intake became significantly higher in the broilers raised on litter at weeks (3,4 and 5) than cage system. While the feed conversion ratio was better for broilers that were raised in battery cages so feed conversion ratio was significantly worse ($P < 0.05$) at weeks (2, 3, 4 and 5) in the litter system than cage system just at the week (1) feed conversion ratio was significantly better in the litter system than cage system. The study concluded that battery cages were able to give good performance due to maintaining indoor air quality, reducing microbial contamination, and enhancing growth traits and immunity of broiler chickens compared to traditional deep litter systems.

Keywords: Broiler, body weight, feed intake, cage system, litter flour system

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
www.semcon.unib.ac.id

Important Causes of Sheep and Goat Mastitis

Mariwan Abas Hasan, Ali Dawd Sleman, Darun Mahamad Mahmud, Mahmood A. Hussein*
University of Garmian, Iraq

*Corresponding author: mahmood.ahmad@garmian.edu.krd

Abstract

Clinical mastitis is an important disease in sheep. The objective of this work was to identify causal bacteria and study certain epidemiological and clinical features of clinical mastitis in ewes kept for meat and wool production. Mastitis is the infection of the mammary gland or udder. Bacterial mastitis is diagnosed by the presence of bacteria, by increased numbers of white blood cells in the mammary fluid, and by tissue changes. Bacterial infection causing mastitis usually occurs through the teat of the animal rather than being transmitted through blood. Mastitis is an important disease because it is difficult to control and causes problems for animal welfare, and because of its economic impact. The purpose of this research is to identify treatment protocols for mastitis in sheep and goats. Mastitis, or inflammation of mammary glands and teats, is a worldwide issue that affects sheep and goats as well as dairy cattle. To reduce its negative impact and allow animals to recover and be protected from future infections, antimicrobial treatment needs to be quick and effective. Broadly acting medicines should be followed by targeted approaches. Treatment may fail due to incorrect medication or contamination. Treatment of mastitis can affect milk production and testing is necessary before milk can be sold from treated animals.

Keywords: Mastitis, causes, sheep, goat, staphylococcus

The 2nd International Undergraduate Conference on Agriculture & Life Science (Online Conference)
Faculty of Agriculture, University of Bengkulu, September 25th, 2022
https://semcon.unib.ac.id/index.php/iuca2022

Analysis of Fishing Business Income in the Putri Hijau District of North Bengkulu Regency

Elis Tyaningsih, Reswita, and Nyayu Neti Arianti
Department of Agricultural Socio-Economics, Agribusiness Study Program, Faculty of Agriculture, Bengkulu University

**Corresponding author*: reswita17@yahoo.co.id

Abstract

The income of fishermen always fluctuates. Income fluctuations occur due to seasonal factors, especially the lean season which is marked by a decrease in catches. At this time, in the Putri Hijau sub-district, many factories have developed, namely coal factories, palm oil factories and rubber factories. Many fishing ports have moved because the initial location has been damaged due to massive abrasion. Abrasion around the port is thought to be due to the presence of a coal factory that continues to dig on the seabed so that the seawater becomes high and erodes the soil. Not only abrasion is happening at this time, seawater has also been polluted by the presence of waste from palm oil mills. Even though the current sea conditions are not as good as they used to be, they continue to work as fishermen. This is what makes researchers interested in conducting research on the analysis of fishermen's income, whether the income earned by fishermen in Putri Hijau District is at UMR or below the UMR in Bengkulu Province/ sufficient or not to meet family needs. This study aims to analyze the amount of income earned by fishermen in Putri Hijau District, North Bengkulu Regency, Bengkulu Province. This research was conducted intentionally (*purposive sampling*).

This research was conducted from 05 to 11 November 2021 with an interview method using a questionnaire. The sample in this study amounted to 60 respondents, the determination of respondents was selected using the census method. The location of this research was chosen intentionally (*purposive sampling*), which was conducted in Putri Hijau District, North Bengkulu Regency, Bengkulu Province. The types of data used in this study are primary data and secondary data, and the data analysis used in this study is quantitative descriptive analysis. The results of this study indicate that the average total income obtained by fishermen is Rp. 9,679,083 and the average total cost incurred is Rp. 3,519,673, so the average income received by fishermen in Putri Hijau Subdistrict, North Bengkulu Regency is Rp. 6,159,410. Thus, it can be concluded that the fishing business in Putri Hijau District, North Bengkulu Regency, Bengkulu Province is classified as a prosperous, successful, and prosperous fishing business, and is considered capable of meeting household needs in daily life because the average income earned by fishermen in the study site has exceeded the minimum wage for Bengkulu Province, which is Rp. 2,238,094. For fishermen, it is hoped that they must care for and maintain the preservation of the waters so that the income of fishermen in Putri Hijau District can be stable and able to meet their daily economic needs.

Keywords: Income analysis, business, fishermen