

The Application Modular Floating Pontoon to Support Floods Disaster Evacuation System in Heavy Populated Residential Area

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During floods disaster in the heavy populated residential area, the lack of existing life saving appliances system such as rubber boat and wooden boat were not able to evacuate the disaster victims spontaneously in mass. The condition might be explained since the rubber boat and wooden boat have limited occupant capacity. Based on the conditions, the main objectives of the research are focused on the evaluation of the application of modular floating pontoon as multipurpose floating equipment to support floods disaster evacuation ...

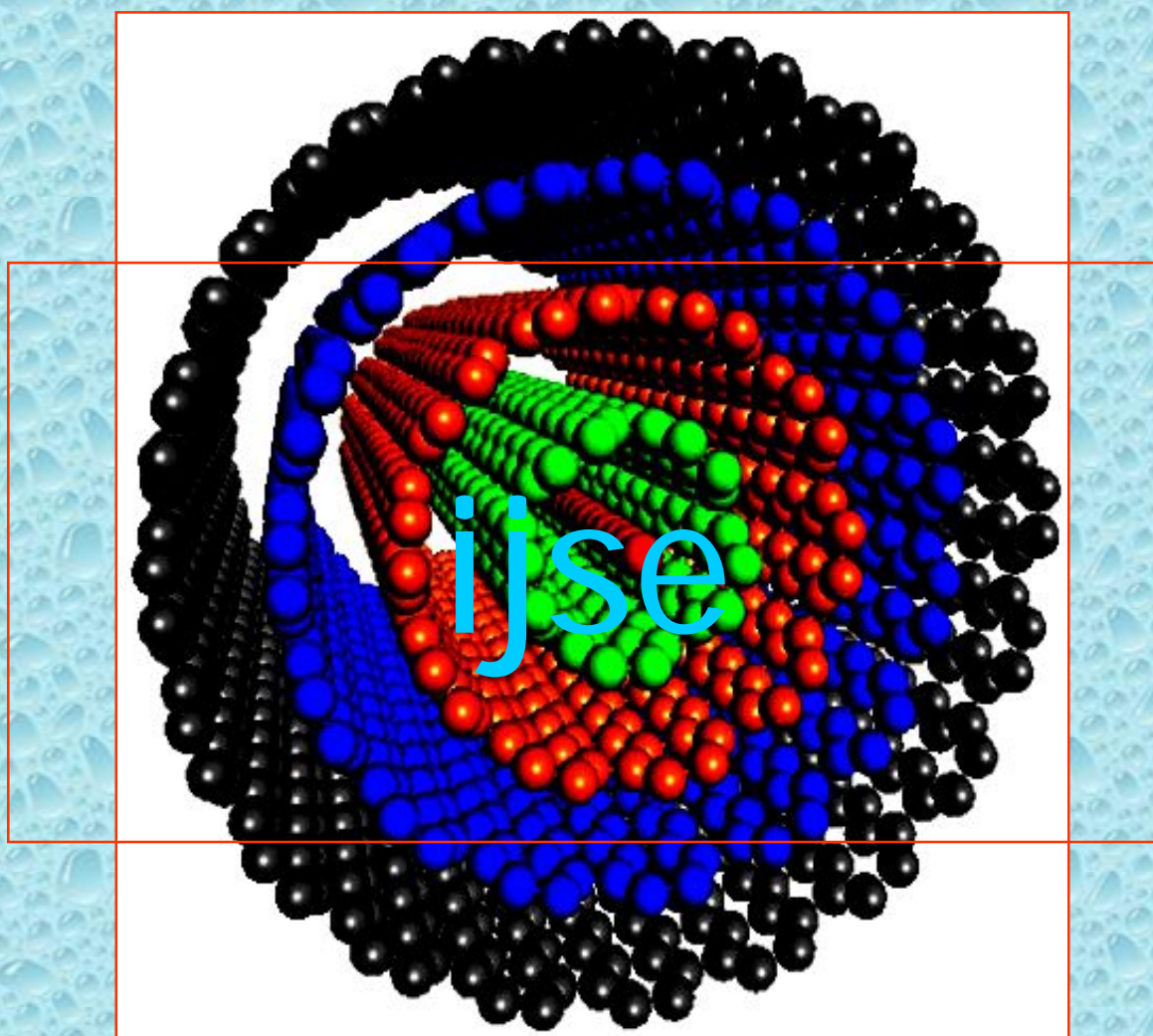
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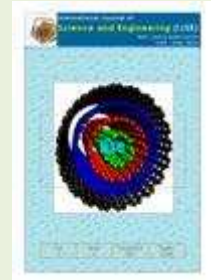
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The Application Modular Floating Pontoon to Support Floods Disaster Evacuation System in Heavy Populated Residential Area

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Abstract - During floods disaster in the heavy populated residential area, the lack of existing life saving appliances system such as rubber boat and wooden boat were not able to evacuate the disaster victims spontaneously in mass. The condition might be explained since the rubber boat and wooden boat have limited occupant capacity. Based on the conditions, the main objectives of the research are focused on the evaluation of the application of modular floating pontoon as multipurpose floating equipment to support floods disaster evacuation process. The investigation of the modular floating pontoon performance such as hydrostatics characteristics, the equilibrium condition and the intact stability was studied using strip theory and Krylov's method. Furthermore, the strength analysis of the modular floating pontoon structure was calculated using finite element method. The results show that the modular floating pontoon is reliable to support the evacuation process.

Keywords— Modular floating pontoon, evacuation system, heavy populated residential area, floods disaster equipment, intact stability, equilibrium condition, strength analysis

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I. INTRODUCTION

Indonesia has many regions which are very susceptible to floods. In 2013, the Jakarta business center area such as Thamrin and Sudirman Street were also swamped by floods. Based on the data of Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG), the average of rainfall in the Jakarta area reach 250-300 millimeters per day in the rainy seasons. It could be three to four times than the typical rainfall, Fig. 1, [1]. The extremely high rainfall may lead to ecological disasters such as: floods, the shutdown of economics activities and crisis of freshwater.

The floods in Jakarta, instead of the heavy rain since December 2012, was caused by the poor drainage systems, the many embankments collapse and the water current volume increased through the 13 rivers across the city. The surrounded regions such as: Bogor, Bekasi, Depok, Tangerang undergo the same circumstances. On January 18th 2013, National Disaster Management Agency declared that the number of casualties recorded were 12 people killed caused by the flood with the details as follow: five persons due to electric shocks, two persons because of the cold, two persons because of the slip or fall, one person was drowning,

and two person was found dead at home. Finally, it is confirmed that the total of disaster victims became 20 persons died, and 62.819 persons were relocated, [2].

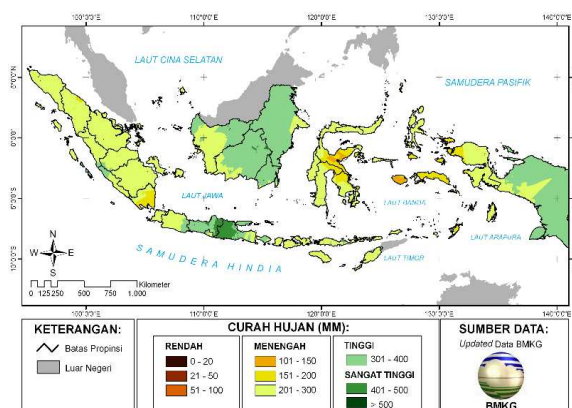


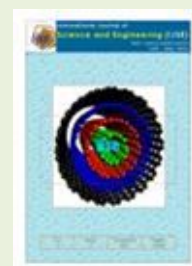
Fig. 1 Rainfall distributions on February 2013, [1]

Many efforts were made to address the various problems that occurred during floods such as: the improvement of river



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Assessment of *Nelumbo nucifera* and *Hydrilla verticillata* in the treatment of pharmaceutical industry effluent from 24 Parganas, West Bengal

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Abstract - Modern day technologies employed in industrialization and unhygienic lifestyle of mankind has led to a severe environmental menace resulting in pollution of freshwater bodies. Pharmaceutical industry effluents cause eutrophication and provide adequate nutrients for growth of pathogenic bacteria. This study has been conducted with aquatic plants water lotus (*Nelumbo nucifera*) and hydrilla (*Hydrilla verticillata*) with an novel aim to treat pharmaceutical industry effluents showing the outcome of the experiments carried out with the effluents collected from rural areas of 24 Parganas, West Bengal, India. Determination of pH, solid suspend, BOD₅, NH₃-N, MPN and coliform test were used for this notioned purpose. Pharmaceutical waste effluent water treated with water lotus showed less pH, solid suspend, DO, BOD, NH₃-N, MPN and coliform bacteria than hydrilla treatment when compared to the control. In conclusion, water lotus is found to be more efficient in treatment of pharmaceutical industry effluent waste water than hydrilla.

Keywords - aquatic plants, pharmaceutical effluent, waste water, water lotus, hydrilla.

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I. INTRODUCTION

Earth is covered by almost 70% water. Fresh-water content of this total available water of the earth is only 3% which comprises of icecaps, glaciers, groundwater and surface water. Only 0.3% of this surface water is available for human use like agriculture, household and drinking, industry, etc. in the form of lakes, swamps and rivers. Modern technology, global industrialization and unhygienic lifestyle have lead to a serious problem of pollution in freshwater resources like lakes, rivers and swamps [1]. Industrial effluents contribute to the inorganic pollution due to addition of waste chemicals. Anthropological influences like domestic liquid discharge, agricultural wastes, organic industrial wastes, etc. provides adequate

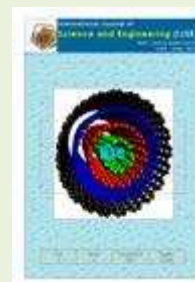
nutrients in dissolved state for growth of pathogenic bacteria, and algae and also which interferes in beneficiary use of these natural supplies of freshwater. Rivers, lakes and other freshwater bodies encounter a serious environmental problem of eutrophication due to excess deposition of phosphorus deduced from various human activities [2]. Pharmaceutical industry effluents add up to the existing contamination of freshwater bodies which can cause acute water pollution and other environmental hazards.

Aquatic plants have been used to recover and recycle these waste waters and use them for agricultural and industrial purpose if not for household and domestic use. Low cost, easy maintenance and the ability to assimilate nutrients and sediment the inorganic chemicals makes the



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Investigation on the Effect of Shapes on the Drying Kinetics and Sensory Evaluation Study of Dried Jackfruit

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Abstract - Jackfruits are seasonal and highly nutritional fruits indigenous to the Southwestern rainforests of India. However much of the produce are spoilt annually due to poor preservation techniques. Minimal studies have been conducted on the drying kinetics of jackfruit and the effect of shapes on the drying kinetics. In this research, drying curves of three different shaped jackfruit slices were obtained using a convective oven at 40°C, 50°C, 60°C and 70°C. Modified Midilli-Kucuk Model was found to be the best kinetic model for drying of jackfruits. At all temperatures, effective moisture diffusivity values and activation energy varied from 2.66×10^{-10} - $4.85 \times 10^{-10} \text{ m}^2/\text{s}$ and 16.08 - 20.07 kJ/mol respectively. Drying was found to be most efficient at 50°C using the square shaped slices with a R^2 , RMSE and SSE value of 0.9984, 0.01127 and 0.002668 respectively. Sensory evaluation of untreated and additive-added dried jackfruit slices was conducted by 40 untrained sensory panelists. Jackfruit with ascorbic acid and sugar coating had highest aesthetics value due to better retention of colour by ascorbic acid. However sugar coated jackfruit had the most favorable taste and smell. Further optimization must be done to satisfy consumers collectively to enable a highly marketable product.

Keywords—Activation energy; Effective diffusivity; Jackfruit; Oven drying kinetics; Sensory evaluation

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I. INTRODUCTION

Jackfruit is one of the many seasonal local fruits available in Malaysia and is indigenous to the South-western rain forests of India (Boning, 2006). Jackfruits are fruits rich in energy, dietary fibre, potassium, magnesium, iron, vitamin B-complex, vitamin C and many other nutrients. They are also free from saturated fats and cholesterol making it an excellent choice of fruit for consumers (Umesh, et al., 2010; Swami, et al., 2012). Many methods of preservation have been applied to preserve the multi-nutritional jackfruit for the consumers. However, nearly 75% of jackfruit in India still gets spoilt annually due to lack of proper preservation, an integrated supply chain and storage facilities during peak seasons of harvesting (GlobalVillageFruit, 2013).

Preservation of food has been a way of life since prehistoric times to maintain the availability of food for human consumption. Among many methods of food preservation, drying or dehydration is one of the oldest techniques to prevent damage and spoilage of the food by microorganisms; subsequently, presenting higher stability of food for easier storage and transport (Mulet, 2011). Currently, most jackfruit studies compare final values of antioxidant activity, total phenolic contents and phytochemical aspects of the fruit after undergoing different drying techniques

(Shanmugapriya, Saravana, Payal, Mohammed, & Binnie, 2011; Baliga, Shivashankara, Haniadka, Dsouza, & Bhat, 2011). Minimal studies on the drying kinetics of the jackfruit have been studied because more researchers are concerned with the nutritional value of the jackfruit after drying. However, without a proper optimization of the drying process initially, conclusive values of nutritional values from different drying techniques should not be made.

In this experiment, the convection oven drying of jackfruit with three different shaped cuts was thoroughly studied for their drying kinetics to showcase the best fit of drying data in comparison to drying models from previous researches. The drying kinetics of jackfruit slices obtained can be used for better optimization of fruit dehydrators for jackfruits. Consecutively, the consumer acceptance of the dried jackfruit slices was analysed using sensory evaluation tests which target the three main senses namely sight, smell and taste. The preference typed sensory evaluation in this experiment allowed better understanding of the consumer demands and the perception of the general public on preserved dried jackfruit which was untreated compared to jackfruits which had food additives. The results of the sensory evaluation will provide a preliminary analysis for dried fruit manufacturers in Malaysia and especially India on whether to invest on the



Growth performance and mineral status on goats (*Caprahircuslinn.*) supplemented with zinc proteinate and selenium yeast

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Abstract - The aim of this study was to determine the effects of dietary supplementation of Zn proteinate and Se yeast on growth performance and mineral status in local goats. Twenty two (22) doelings weighing 7.86 ± 2.12 kg were grouped into 6 weight classes in a feeding trial to determine the effects of dietary zinc proteinate and selenium yeast on mineral status and growth performance. The Zn-supplemented groups received 200 mg additional Zn daily from chelated Zn proteinate, an insoluble powder containing 15% elemental Zn. Se-supplemented groups received 3 mg Se from Se yeast consisting mainly of selenomethionine (63%). The four (4) dietary treatments were as follows: T1 : 0 mg Zn + 0 mg Se; T2: 0 mg Zn + 3 mg Se; T3 : 200 mg Zn + 0 mg Se. T4: 200 mg Zn/head + 3 mg Se/head. The experiment was conducted in a 2 x 2 factorial design in RCBD. Napier grass used in the trial contained 89.03 ppm Zn, while the mixture of corn-soybean oil meal had Zn content 49.73 ppm. Supplementation of Zn and Se in the diets composed of 60% Napier and 40% soya-corn mix had no effect on dry matter intake, body weight gain, and feed efficiency. Giving 200 mg Zn/head tends to increase ($P < 0.05$) the Zn concentration in the blood of doelings among the levels of Se. Percent digestibility of Zn decreased with Zn supplementation at 200 mg. Percent apparent digestibility of Zn tends to be higher in animals without mineral supplementation. Results indicate that Zn and Se supplementation did not affect growth performance. Zn supplementation increased blood Zn concentration, but did not affect digestibility of Zn.

Key words- goats; minerals; digestibility; growth; performance

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Introduction

In order to increase the animal productivity, people are trying to develop new technology to manipulate feed formulation such as silage, amofer technology, fermentation and ammonization to improve feed quality [1; 2; 3; 4]. Nutrient manipulation such protein-energy ratio was studied related to feed quality [5]. Among those technology regarding feed quality, farmer tend to be underestimate the availability of mineral among the available nutrients in the feed, since the needs of the animals are in small amount. Mineral nutrition of ruminant is a chronic problem since most forage plants contain varying levels of micro-minerals. To maintain the balance of minerals, the animals are given mixture of minerals to prevent deficiency that can cause certain diseases and maintain optimum productivity [6]. Underwood and Suttle [7] stated that minerals have the functions of the body's metabolic processes, among these

are: structure, physiological, catalysts and regulator. Mineral requirements of goats are not fully understood or investigated, and established requirements are extrapolated largely from information from cattle and sheep [8].

Zn and Se are critical trace minerals for production and reproduction in farm animals. These minerals are absorbed and used to enhance performance, improve immunity, health and reproduction. While Se initially has been known as toxic element to some plants and animals, it is now recognized as one of the elements needed by the animal for growth and fertility [9]. The primary function of Se is in the synthesis of glutathione peroxidase that helps deactivate oxygen radicals such hydrogen peroxide and prevents them from causing cellular damage [10]. Zn contributes to the growth and division of cells, antioxidants, sexual development, immune cell, dark adaptation, taste, and appetite [11].