

Wuttinan Rueangsri 2012: The Value Added of Green Mussel Shell Waste from Processing by Microbiological Process. Master of Science (Marine Science), Major Field: Marine Science, Department of Marine Science. Thesis Advisor: Assistant Professor Jintana Salaenoi, Ph.D. 134 pages.

Green mussel (*Perna viridis*) is an economically important product in the marketplace. It is a food commonly consumed, cheap, delicious and highly nutritious value. It can be processed in several designs. After processing, various wastes of mussel shell fragments were produced and a lot of garbage, diseases, vectors and bad smell were affected to the environment. To manage these problems, the purpose of this experiment is to modify the worthless shell waste into the useful valuable substances by increasing the amount of important composition from those wastes in microbiological processes. The scope of this study was to find out the chemical compositions of mussel shells and adjusted the appropriate process of fermentation by comparing the two fermentation techniques; fermenting with natural flora and natural flora mixed with commercial flora before applying the fermented product for the high benefits. The results showed that the maximum compositions of mussel shells were calcium comparing to the others. The contents of SO_3 , MgO , P_2O_5 , Mg , Al_2O_3 , Na_2O and Si were detected in descending order. SEM analysis showed the outer shell has less porous than the inner. The fermented mussel shells without aeration had a rough eroded and more porous comparing to the unfermented ones. It was found that the ferment without aeration using microorganisms in the ratio of 200 : 66.7 : 66.7 : 0.17, 500 : 166.7 : 166.7 : 0.42 and 1000 : 333.3 : 333.3 : 0.8 [sample: molasses: water: commercial strain] had the highest effective in releasing calcium from the mussel shell and the pH value of the extract became the lowest in week 3 after the process.

After testing the efficiency in reduce turbidity and protein of waste water releasing from the milk plant, Kasetsart University, the data was confirmed that the adding of the fermented mussel shell residues in waste water, the decreasing of turbidity and protein occurred. The bio-extract from the fermentation without aeration at the ratio of 1:500 - 1:1000 had the high effectiveness in promotion the growth of the green bean sprouts. And the bio-extract also served the medium for phytoplankton. At the ratio of 0.04 : 0.06 (media : bio-extract), the growth of *Chlorella* sp. was at the same rate comparison to the use of the medium only and at that ratio, ammonia and nitrite in the medium was decreased.

Student's signature

Thesis Advisor's signature