Calcium Hydroxide Nanoparticles-coated Broken-milled Rice Foam: Novel Eco-Friendly Approach to Reduce Ocean Acidification

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Ocean acidification is the crucial environmental problem that CO_2 has been absorbed by seawater and turn to H_2CO_3. This phenomenon causes the oceans to become more acidic and reduce CO_3^{2-} in seawater to be relatively less abundant. As CO_3^{2-} is the precursor of $CaCO_3$ in the shell formation and the coral calcification. Therefore, ocean acidification causes the shell formation failure in aquatic animals and coral bleaching in coral reefs. The originated idea of this project was expected to solve the problem of enormous quantity of undegradable foam wastes in the sea from "Loi Krathong" (Annual Festival throughout Thailand to pay respect to the water by floating the decorated materials). Hence, this work aims to create biodegradable foam from low-cost residue such as broken-milled rice and coating the foam with $Ca(OH)_2$ nanoparticles. $Ca(OH)_2$ will react with H_2CO_3 to reduce acidity and assist the process of shell formation and coral calcification by producing $CaCO_3$ as a by-product. The physical properties of the foam will be characterized and the testing with artificial seawater will be conducted for the convenient scientific control. The pH of the seawater will be continuously monitored to confirm that the $Ca(OH)_2$-coated foam can increase the pH of the seawater.