The Revolution of Plastic

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This study aims to research the possibility of using sago starch to make pure degradable bio-plastic without adding any other plastic, resin or rubber available in the market. The goal of this investigation is to create a fully natural bio-plastic by using sago starch and glycerol. Experiments were carried out to investigate the tensile strength, elongation at break, water absorption capacity and biodegradability of the sago starch-based bio-plastic. In terms of biodegradability, sun exposure test, soil burial test, fermentability microbe decomposition test, simple hydrolysis, acid hydrolysis and alkaline hydrolysis were carried out. Results showed that the best ratio of starch to glycerol in making sago starch-based bio-plastic was 3:1 and the bioplastic made from this ratio showed the highest tensile strength and maximum load which were 8.34MPa and 206.74N. The first week of water absorption test showed a significant of $p<0.01$ the following four weeks. Whereas in biodegradability, the weight of the bio-plastic decreased in the sun exposure test, soil burial test and fermentability microbe decomposition test. Besides, the bioplastic showed the ability to degrade when in contact with water, low pH and high pH value at 70°C. Therefore, I conclude that sago starch is able to make biodegradable plastic without any other plastic, resin and rubber added to it. There is a possibility of using sago starch to make biodegradable plastic in order to replace the petroleum-based plastics which are widely used in our life.

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