TITLE: PRODUCTION OF BIOPLASTIC FROM ROOT STARCH AND VEGETABLE PIGMENTS AS AN ALTERNATIVE TO CONVENTIONAL PLASTICS

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ABSTRACT:

Conventional plastics, derived from petroleum, take about a century to be degraded in the environment, accounting for a significant part of the waste that accumulates in nature directly causing environmental pollution. Biodegradable plastics have physical and chemical properties similar to conventional plastics, but these take a long time to be degraded. This is because many microorganisms, such as bacteria and fungi found in the soil, release some enzymes capable of decomposing biodegradable plastics, which is impossible in the case of conventional plastic. A raw material used to produce bioplastic, starch, has propitious characteristics for the formation of biodegradable polymers. Thus, the high cost of oil and the worldwide trend of reducing environmental impacts have increased the need and interest of producing biodegradable materials. In laboratory, bioplastics based on sweet potato starch (*Ipomea batatas*), potato and cassava were produced by the following procedure: 10 g of starch sample extracted from the vegetable were weighed on a precision scale; with pipettes, were measured 50 mL of water, 8 mL of glycerol, 12 mL of acetic acid and with a precision scale was measured 10g urucum (*Bixa orellana*) in the production of natural pigment. All substances were mixed in a 600 ml beaker and then heated with Bunsen burner with constant stirring through a glass rod until the mixture reached the desired consistency. The obtained gel was then deposited on plastic plates to cool and dry. After drying it was possible to observe that the plastic produced from sweet potato with the addition of urucum (*B. orellana*) presented greater tensile strength. Bacterial degradation was also shown to be effective. Within two weeks the tested samples were completely degraded leaving negligible amount of residues as opposed to petroleum plastic. Based on the experiments carried out, it can be concluded that the proposed procedure presents a bioplastic with high biodegradation potential; and with the addition of the urucum powder as a natural dye in addition to promoting pigmentation also allowed an increase of the resistance in relation to the bioplastic without dye.

Keywords: biodegradation, microorganisms, Oil, waste.

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