POLIPLASTIK: From Waste to a Sustainable Biopolymer

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Toxic waste such as petroleum-based plastics are a factor that contribute seriously to environmental deterioration, being a poison for ecosystems. In the Community of San Pablito, Mexico, Amate Paper is made since pre-Hispanic times, this artisanal production discards large amounts of mucilage daily, wasting this liquid with coagulant properties. Additionally, the waste contains large amounts of chlorine, devastating considerably the flora and fauna of this community. Our proposal is to create POLIPLASTIK, a biopolymer made with citrus peel flour processed with chlorine-free mucilage. In order to make this project an efficient method of clarification is proposed avoiding the use of chemicals, warming gradually the mucilage. After that we made a homogenous mixture of citrus flours and mucilage, taking advantage of the pectin present in the orange peel and the starch of Heliocarpus appendiculatus, from which a bioplastic with diverse textures can be created. When we increased the amount of orange flour, the elastic modulus becomes more rigid, and brittle. In relation to its resistance to flexion the same behavior is observed, when the amount of flour is increased its Resistance to flexion diminishes. About its biodegradation, it can be indicated that as the flour content increases, the degradation of the material is faster. We proposed a sustainable alternative to waste reuse in this community of 3,000 inhabitants, strengthening their culture, economy and decreasing pollution rates.

Awards Won:
Fourth Award of $500