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The potential of biodegradable compostable eco-straw from *Lepironia Articulata* sp. (Purun/Kercut)

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ABSTRACT

Plastic drinking straws are widely used to drink water and have been shown to be a useful tool in restaurants. Excessive usage, on the other hand, generates a large amount of plastic garbage that is hazardous to the environment and can harm endangered species. According to the findings, subjective norms and perceived behavioral control all have a significant influence on their receptive purpose toward biodegradable drinking straws. The goals of this study were to look into the degradable duration of biodegradable straw, analyse the population of Escherichia coli *(E-coli)* in biodegradable straw as an indicator of potentially harmful bacteria. An organoleptic evaluation of the straw has been carried out to ensure that the products satisfy the standards set by the organization as well as suit the expectations of the customers. *E.coli test* for straw hygienity utilising water and wastewater treatment guidelines. In terms of straw structure that can be dissolved in less than 6 months, straws were tested with and without Calcium Hydroxide ($Ca(OH)_2$) to measure hygiene test. Straw without $Ca(OH)_2$ reached 23 MPN/g and achieved non detected *E.coli in* this straw treated with $Ca(OH)_2$. Finally, *Lepironia Articulata* Sp. (Purun/Kercut) has the potential to become a biodegradable compostable eco-straw and as an alternative to non-degradable plastic straws due to its biodegradable, biocompostable and comparable mechanical properties compared to conventional plastic straws in the current market. The respondents chose biodegradable straws because they can lessen the hazard of ocean waste, reduce microplastics at sea and on land, and are non-toxic. Biodegradable straw from *Lepironia Articulata sp*. in accordance with the towards sustainable development goals.

1. Introduction

The current practices of production, design, utilization, and disposal of plastics have confirmed the severe negative impacts on the globe for ecosystem imbalances, biodiversity, human health, climate change, sustainable livelihoods, cultural diversity, and ultimately human rights [1] (Fig. 1). Plastic's widespread use is explained not only by their inexpensive price, but also by their long lifespan, light weight, and high strength [2]. Sadly, plastic packaging accounts for more than 30 % of worldwide consumption, and its usage was rapidly shifting from multi-use to single-use items, as seen by the trend line in [3]. More than 99 % of all plastic packaging, including straws, bags, and disposable dinnerware, is now manufactured from polymers derived from petroleum. Because of their chemical and biological resilience, they may have remained in the environment for hundreds of years [4], where they pollute and pose harm to both ecosystems and human health [5,6].

Plastic pollution has reached record levels throughout the globe, presenting serious hazards to marine life and coastal populations. Every year, between 4.8 and 12.7 million tonnes of plastic enter the ocean, with the great majority settling in the Indian and Pacific seas [7]. The decomposition of organic pollutants causes eutrophication, which in turn reduces oxygen levels for aquatic life, and they also reduce the amount of light reaching the water's surface, which has a negative impact on photosynthesis in aquatic plants [7]. Determining the phytoremediation plants' tolerance to the exact amounts of contaminants in wastewater is necessary before a large-scale phytoremediation treatment can be performed [8]. According to the United Nations Environment Programme (UNEP), a huge amount of modern plastic manufacturing has shifted toward single-use plastics [9].

Over the past fifty years, the demand for products made of plastic has

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