

Antimicrobial Edible Bio-Disposables of Kombucha of Fruit Skins With Chitosan Coating

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The plastic pollution problem worldwide has worsened due to the use of non-biodegradable tablewares in takeaways during the pandemic. Public hygiene concerns have also arisen. Eateries provided wrapped disposables to ensure hygiene, but produced an extra amount of wastes. To ensure hygiene and environmentally friendly, we invented a new material which has good antimicrobial ability, is edible and biodegradable. We apply the material to make our edible kombucha of fruit skins with chitosan coating (KFC) as antimicrobial bio-disposables to ease the burden. Kombuchas are cellulose membranes while chitosan is an edible dietary fibre that has antibacterial and antifungal properties which qualify it for food preservation. In this investigation, edible roasted kombuchas with chitosan coating were tested and certified based on GB 18006-2008, ISO18188:2016 and COMMISSION REGULATION (EU) 2017/2158 on the presence of acrylamide in food, so they should be edible and safe for consumption, biodegradable with high tensile strength, show good water proofness and would not cause any allergic effect. Our invention signifies a breakthrough as they are not only eco-friendly alternative materials to replace plastics disposables, but also antimicrobial so that natural resources are saved from making wrapping materials for disposables. Besides, an innovative greener way that involves neither 2M nitric acid nor 16.7M NaOH but using vinegar only to obtain antimicrobial chitosan coating from BSF was discovered. When *Mucor rouxii*, a source of chitin deacetylase was used in the second step of the Green Vinegar Method, chitosan with a higher DD% and a higher yield was obtained, so it is greener to incorporate fermentation in this innovative green method to obtain chitosan from BSF shells.