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Valorisation of avocado seeds: extraction and characterisation of starch for textile applications

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#### ABSTRACT:

Sustainable disposal of the waste is problematic due to increasing shortages of landfill space. Avocado is a common fruit that is widely consumed in many countries. This consumption results in large quantities of avocado waste being generated by the avocado processing industries. However, avocado seeds contain large amounts of starch that could be beneficiated. Starch is widely used in various industrial applications and is routinely sourced from food crops, thus competing with traditional sources of food. Alternative non-food sources of starch are needed. This work focused on ascertaining the cleaner way of extracting starch from avocado seeds for use in industrial applications. The starch was extracted from avocado seeds via a wet extraction method and tested for application in the textile industry. Optimal conditions for the extraction of starch were determined using statistically designed experiments employing a Box–Behnken design and Statistica 13 software for the experimental design, statistical analysis and optimisation of the extraction process. The analysis of variance results revealed that a quadratic model is significant for the factors and responses studied. A quadratic mathematical model was developed, and

the optimum combination of a response factor was obtained by the simultaneous optimisation of the responses. The starch yield was 64% (on dry weight basis). Analysis of the extracted starch showed that it contained well over 90% starch content. Application of the starch in textile applications showed that it performed as well as a commercial starch sample. The collection and processing of waste avocado seeds can be a new source of employment and provide income generation opportunities.