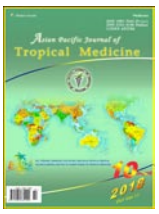

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A study on the optimization and characteristics of enzymatic preparation of *Artocarpus heterophyllus* Lam (Jackfruit) seed resistant starch

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ABSTRACT **Objective:** With the development of the *Artocarpus heterophyllus* Lam (*A. heterophyllus)* processing industry, *A. heterophyllus* Lam seed as by-products, usually are cooked to eat or discarded, and no industrial application has yet been discovered in china. It is especially important to study the nutrients of *A. heterophyllus* Lam seed and to develop and utilize them. *A. heterophyllus* Lam seeds are rich in starch. At present, there are few reports on the processing of native starch of *A. heterophyllus* Lam seed and its modification as well as the application. To find the best way to prepare the resistant starch of *A. heterophyllus* Lam seed and to witness the changes in starch properties before and after the treated starch molecules. **Methods:** *A. heterophyllus* Lam seed starch was used as raw material in this paper and was treated by autoclaving and pullulanase debranching to produce resistant starch. Resistant starch content was confirmed by a resistant starch assay kit from Megazyme, Ireland, according to the AOAC 2002.02 standard method recommended by the American Society of Analytical Chemists. Taking resistant starch content as an indicator, the single factor and L9 (3^4) orthogonal experiment were used to optimize the processing parameters. Electronic scanning microscopy, X-diffraction and Differential scanning calorimetry were used to characterize native starch and treated starch molecules. **Results:** The optimal preparation process for preparing the resistant starch of *A. heterophyllus* Lam seed was starch milk concentration with the ratio of 15%, with enzyme15 ASPU/g, and with enzyme treatment time in 24 h, and starch retrograde time in 24 h. The resistant starch content was 25.82%. After being treated, *A. heterophyllus* Lam seed starch became a sheet with a large number of micropore. Crystal of starch changed from A type to B+V type, and the gelatinization temperature range became wider and gelatinization enthalpy value became decreaser. **Conclusions:** Resistant starch content of *A. heterophyllus* Lam seed starch was greatly improved after being treated. High resistant starch content of the treated starch indicates that it can be used as one of the carbohydrate components in diabetic foods to control blood sugar. The porous structure of the treated *A. heterophyllus* Lam seed starch indicates that it can be used for advanced controlled release of bioactive extracts.

Keywords: *Artocarpus heterophyllus*; Lam seed starch; Resistant starch; Aautoclaving; Pullulanase debranching

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