

THE HYDROLYSIS OF RICE STARCH WITH PULLULANASE FOR ENZYME-RESISTANT STARCH PRODUCTION

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Summary

In this study, high resistant starch content product was prepared from IR50404 variety rice starch by debranched hydrolyzing of amylopectin with pullulanase Promozyme[®]D2. The optimal hydrolyzing parameters were investigated and determined basing on resistant starch content. Those conditions were as follows: selected substrate was retrograded starch instead of gelatinized one; substrate concentration, 15% (w/w), pH, 5.5 - 6.0; temperature, 55 - 57°C; hydrolysis time, 10 h; amount of pullulanase, 20 NPUN/g. The results based on analysis of the degree of hydrolysis (DH) showed that the hydrolysis time could be shortened to 6-8 hours if the enzyme amount was increased to 20-25 NPUN/g. The product has resistant starch content 31.8%, amylose content 49.56%, degree of hydrolysis 5.53, degree of polymerization 343, water solubility 28.7% and swelling power 8.93%. Results by XRD and SEM analysis showed that starch molecule had rearranged and changed their crystal pattern from A to V-type, while the starch granule morphology clearly changed.

Keywords: *Debranching, degree of hydrolysis, property, pullulanase, resistant starch RS3, rice starch.*