

Phatthranit Klinmalai 2014: Effect of Chitosan on Physicochemical Properties of Rice Noodle.
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The objective of this work were 1) to study the effect of chitosan on physicochemical properties of rice starch and rice flour e.g. pasting properties and thermal properties 2) to study the effect of chitosan on physical properties, microstructure, the interaction between rice starch and chitosan and texture properties of rice noodle prepared from rice flour and rice starch 3) to study the effect of chitosan on retrogradation and quality of rice flour noodle during storage. The concentration of chitosans used in this work were 0.33% and 0.50% chitosan in 0.33% acetic acid. The addition of chitosan in rice starch and rice flour slurry increased peak viscosity, trough viscosity, final viscosity and setback when compared to sample with the presence of acetic acid. The addition of chitosan and acetic acid had no effect on T_o , T_p , T_c and ΔH of starch gelatinization in both rice starch and rice flour. Fluorescence micrographs revealed the distribution of chitosan clusters in rice starch noodle. These chitosan clusters may interrupt the formation of starch network in rice starch noodle. Softness and cohesiveness of rice starch gel with chitosan were the highest. This may be attributed to the interruption of chitosan in starch network. However, chitosan had no effect on the texture of rice flour gel. Fluorescence micrographs and confocal laser scanning micrographs of rice flour noodle revealed that there was protein network in rice flour noodle. Therefore, the protein network may retard the interruption effect of chitosan in rice flour gel. The addition of chitosan had no effect on the moisture content but it increased the yellowness of rice starch and rice flour noodle. The yellowness of rice noodle increased with the increase of chitosan concentration. Amylopectin retrogradation enthalpy of rice flour noodle continuously increased during storage for 5 days at 30°C but amylopectin retrogradation enthalpy of rice flour noodle increased at day 1 and then it was constant during storage for 14 days at 4°C. The storage time of rice noodle had no effect on the change of pH and color at both temperatures. Moisture content of rice flour gel decreased during storage for 5 days at 30°C but it was constant during storage for 14 days at 4°C. Chitosan can retard the increase of hardness and decrease of cohesiveness and springiness of rice flour gel during storage at 30°C. However, chitosan cannot retard increase of hardness in rice flour gel during storage at 4°C.

Student's signature

Thesis Advisor's signature