Thermal properties of globulin from rice (*Oryza sativa*) seeds

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Abstract

The thermal properties of rice (*Oryza sativa*) seed globulin were studied by differential scanning calorimetry (DSC) under the influence of various medium conditions. The denaturation temperatures (T_d) of crude and purified rice globulin were 97.6 and 98.5 °C, respectively. Increasing salt concentration enhanced thermal stability of rice globulin. The effect of chaotropic anions on DSC characteristics of rice globulin followed the order of the lyotropic series indicating progressive decreases in both T_d and enthalpy (ΔH). Extreme pHs and protein perturbants (sodium dodecyl sulfate at above 20 mM, dithiothreitol, urea and ethylene glycol) caused marked protein denaturation and loss of thermal stability. In contrast, *N*-ethylmaleimide and SDS at below 20 mM exerted a stabilizing effect on rice globulin. Pre-heat treatments led to partial unfolding of rice globulin, and the level of denaturation increased progressively with increasing heating time.

Keywords: *Oryza sativa*; Differential scanning calorimetry; Globulin; Protein denaturation