Penaeus monodon (Tiger Shrimp) Hemocyanin: Subunit Composition and Thermostability

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Arthropod Hemocyanin, Functional Unit, Stability

Penaeus monodon (class Crustacea, order Decapoda) is one of the largest shrimps of the *Penaeidea* family from the Indo – West Pacific region. The dioxygen-transporting protein hemocyanin, isolated from the hemolymph of this invertebrate, is composed of three 75–76 kDa structural/functional subunits designated as Pm1, Pm2 and Pm3. The N-terminal sequences of the chains were determined and compared with those of other decapodan hemocyanin subunits. Pm2 and Pm3 are highly homologous and electrophoretically undistinguishable polypeptides. In comparison to Pm1, they have an extension of six residues. Pm1 is closely related to the subunit Pv2 of the *Penaeus vannamei* hemocyanin. Probably, subunits like Pm1 and Pv2 are family-specific for the *Penaeidea* hemocyanins and the other subunits are species-specific. Comparison of N-terminal sequences of respiratory proteins from the sub-orders Natantia and Reptantia demonstrated family- and sub-order-specific sequences.

A melting point of 69 °C, lower than those for the di-hexameric decapodan hemocyanins, was determined from the temperature dependence of ellipticity of the mono-hexameric *Penaeus monodon* hemocyanin. Thermostability of decapodan hemocyanins depends on their aggregation state.