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

Stanka Stoeva\textsuperscript{a,*}, Krassimira Idakieva\textsuperscript{b}, Dessislava Nikolova Georgieva\textsuperscript{b}, Wolfgang Voelter\textsuperscript{a} and Nicolay Genov\textsuperscript{b}

\textsuperscript{a} Abteilung für Physikalische Biochemie, Physiologisch-chemisches Institut der Universität Tübingen, Hoppe-Seyler-Straße 4, D-72076 Tübingen, Germany. Fax: 0049-7071-29 33 48. E-mail: stanka.stoeva@uni-tuebingen.de

\textsuperscript{b} Institute of Organic Chemistry, Bulgarian Academy of Sciences, Akad. G. Bonchev-Str. bl. 9, Sofia 1113, Bulgaria

* Author for correspondence and reprint requests

Z. Naturforsch. 56c, 416 – 422 (2001); received January 26/February 23, 2001

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.