Ontogeny of osmoregulation in *Macrobrachium amazonicum:* K^+-phosphatase activity of gill tissue of juveniles

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(Na,K)-ATPase from the gill tissue of the freshwater shrimp *Macrobrachium amazonicum*, is directly involved in osmoregulation process, and this enzyme plays an important role in ammonium excretion, a vital process for these animals. Juveniles were obtained from *Macrobrachium amazonicum* juvenile supplied by FCAV/UNESP prawn hatchery (Jaboticabal, SP), and gill microsomes were prepared according to Garçon et al. (Comp. Biochem. Physiol. 147A: 145-155, 2007). K^+-phosphatase activity was assayed using p-nitrophenylphosphate (PNPP) as the substrate. PNPP stimulated the K^+-phosphatase activity (PNPPase activity) according to Michaelis-Menten kinetics with V= 54.88 U/mg and with K_M= 1.25 mM through. Magnesium (V= 43.14 U/mg; $K_{0.5}$= 0.73 mM; n_H= 1.3) and potassium ions (V= 27.82 U/mg; $K_{0.5}$= 1.62 mM; n_H= 1.8) modulated the enzyme activity through site-site interactions. Ammonium ions alone also stimulated the K^+-phosphatase activity through a single saturation curve according to cooperative kinetics (n_H= 2.6). Maximal activity for NH_4^+ stimulation was V= 27.6 U/mg and $K_{0.5}$ of 7.05 mM. In the presence of different K^+ concentrations (1 to 5 mM), an increase of about 3-fold ($K_{0.5}$ decreased from 4.59 mM to 1.5 mM, respectively) was observed for enzyme stimulation by NH_4^+. Contrary, the stimulation of the enzyme by K^+ in the presence of different concentrations of NH_4^+ (0 to 50 mM) resulted in a slight decrease of enzyme for K^+ ($K_{0.5}$ decreased from 1.7 mM to 2.2 mM). in the presence of 5 and 10 mM NH_4^+, respectively). Ouabain inhibited up to 80% the total PNPPase activity, and the calculated K_I estimated for K^+-phosphatase inhibition was 59.4 µM. These results are inedited and might contribute to the understanding of the role of (Na,K)-ATPase during the ontogeny of osmoregulation of these animals.

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