

## Identification and Characterization of Amylases from Midgut Gland of Two Wild Shrimps: *Farfantepenaeus subtilis* and *Litopenaeus schmitti*

Freitas Jr., A.C.V.<sup>1</sup>; Costa, H.M.S.<sup>1</sup>; Neri, R.C.A.<sup>1</sup>; Castro, P.F.<sup>1,2</sup>; Marcuschi, M.<sup>1</sup>; Ribeiro, K.<sup>1</sup>; Santos, F.M.S.<sup>1</sup>; Cahu, T.B.<sup>1</sup>; Carvalho Jr., L.B.<sup>1</sup>; Bezerra, R.S.<sup>1</sup>

<sup>1</sup>Laboratório de Enzimologia (LABENZ), Departamento de Bioquímica and Laboratório de Imunopatologia Keizo Asami (LIKA), Universidade Federal de Pernambuco, Pernambuco, Brazil. <sup>2</sup>Embrapa Meio-Norte, PiauÍ, Brazil.

The characterization of digestive carbohydrases provides important information about shrimp digestive physiology. The aim of this work was to investigate and to evaluate some properties of amylases from midgut gland (hepatopancreas) of wild shrimps *Farfantepenaeus subtilis* and *Litopenaeus schmitti*. The physical-chemical parameters were determined using 2% starch (w/v) as substrate. The influence of pH (4.5-11.5), temperature (25-75°C) and ions on the amylolytic activity were studied. The specific activity was  $1.5 \pm 0.4$  U/mg for *F. subtilis* and  $1.9 \pm 0.6$  U/mg for *L. schmitti*. The greatest activity was obtained at pH 7.5 for *F. subtilis* and pH 7.0 for *L. schmitti*, whereas the optimum temperature was at 45°C for both species. Amylase-like enzymes were stable, for 30 minutes, at same temperature for *L. schmitti* and at temperature of 55°C for *F. subtilis*. The amylolytic activity of both shrimps was not inhibited by SDS. However, high inhibition by  $\text{Cd}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Hg}^{2+}$ ,  $\text{Zn}^{2+}$  and  $\text{Al}^{3+}$  was observed for both. Using zymogram, six and nine bands showed amylolytic activity in crude extract of *L. schmitti* and *F. subtilis*, respectively, when incubated in starch solution for 60 minutes at 37°C. In conclusion, other studies about amylases would help to elucidate the relation between digestion and nutritional requirements in this species.

Keywords: amylase characterization, digestive physiology, *Farfantepenaeus subtilis*, *Litopenaeus schmitti*.

Financial support: CNPq, SEAP/PR, FINEP/RECARCINE, FACEPE and PETROBRAS AMBIENTAL.