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Fractionation and enzymes activity measurement of the scorpion *Androctinus crassicoda* (Scorpionida: Buthidae) venom

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Abstract

The scorpion of *Androctinus crassicauda* is one of the Buthida family members whose neurotoxic venom is deadly to humans. Enzymes are abundant components of animal venom that play roles in local and systemic symptoms following envenoming. The venom of this scorpions contains various pathological enzymes, among which studies have reported the toxic effects of venom's hyaluronidase and phospholipase A2 enzymes. This study aimed to measure the activity of venom enzymes of hyaluronidase and phospholipase A2 from scorpion of *A. crassicauda* and its fractions. For this purpose, the venom from scorpion of *A. crassicauda* were collected and lyophilized. The whole venom was fractionated on a gel filtration (Sephadex G-50) column. Then protein concentration, hyaluronidase and phospholipase A2 activity of the crude venom and its fractions were determined. Gel filtration on Sephadex G-50 and SDS-PAGE electrophoresis of *A. crassicauda* crude venom revealed four protein picks and 15 protein bands with the majority of molecular masses between 10.0 and 15.0 kDa, respectively. The supernatant obtained from crude venom clarification showed protein content 71.80%, high hyaluronidase (92.40%) and low PLA2 (302±2.1 mg/U) enzyme activity. Fraction 1 showed highest hyaluronidase and phospholipase A2 activities. We found that pH 5 is the optimum pH for hyaluronidase activity and phospholipase A2 activity increases with increasing incubation time. In conclusion, venom of *A. crassicauda* displayed the hyaluronidase and phospholipase A2 enzymes activity, which were separated by gel filtration chromatography in fraction I. Such information is important both for predicting the biological activity of venom components and useful for developing effective antivenoms based on these venom components.

Key words: *Androctinus crassicauda*, Hyaluronidase, Phospholipase A2, Gel filtration chromatography, SDS-PAGE chromatography

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