

Purification of Haemolytic/Necrotic Protein from the Venom of Deathful Hemiscorpius Lepturus Scorpion in Khuzestan Province

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ABSTRACT

Background and Objectives: Scorpion envenomation is a public health problem in Iran. Scorpions are the second accident after snake envenomation in causing human fatalities. Hemiscorpius lepturus is the most medically important scorpion in Iran with 95% mortality. The venom from H. lepturus is primarily a cytotoxic agent and has hemolytic dermonecrotic, nephrotoxic, and to some extent, hepatotoxic activities.

Materials and methods: H. lepturus venom collected from Khuzestan province. Reverse phase HPLC (RP-HPLC) was performed to analyze proteins and peptides in crude venom. The collected fractions were dried and re-solubilized in dH₂O. The haemolytic test done on obtained RP-HPLC fractions and their molecular weights were determined. The positive fractions in haemolytic test were subjected to dermonecrotic test in Rabbit.

Results: The number of 103 fractions collected from C18 RP-HPLC column in the crude venom of H. lepturus. Four fractions with severe hemolytic activities were selected. The SDS-PAGE showed 32-32kDa proteins. The amount of 5 and 20 µg of hemolytic positive fractions were subjected to the dermonecrotic test on rabbit skin and the severity of lesions were studied. These fractions showed a different necrosis level in the skin that the highest activity belonged to the fraction in 157.55 min elution time.

Conclusion: The analysis of the protein contents of the venom of Hemiscorpius lepturus showed that the major toxins are related to the proteins with haemolytic/dermonecrotic activities. The severity of four identified proteins is due to the different isoforms of a major protein.

Keywords: Venom, Scorpion, Hemiscorpius, Lepturus, Toxin, purification, haemolytic/dermonecrotic.