EVALUATION OF THE DIFFERENCES IN PROTEIN PROFILE, OSMOLARITY AND ELECTROLYTE COMPOSITION OF HEMOLYMPH OF FIVE SPECIES OF SCORPION IN KHUZESTAN PROVINCE (SOUTH-WESTERN IRAN)

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(Accepted 22 June 2013)

ABSTRACT: Different species of scorpions studied, are used in the production of polyvalent antisera, 4 of them belonged to Buthidae family including Androctonus crassicauda, Mesobuthus eupeus phillipsi, Hottentota saulcyi and Hottentota zagrosensis and Hemiscorpius lepturus from Hemiscorpionidae family. Scorpion samples were collected from Izeh, Baghmalek and Rahmormoz cities of northern Khuzestan province.

Protein composition of hemolymph was analyzed using polyacrylamide gel electrophoresis (SDS-PAGE) having 14 bands of protein from 42-250 kilo dalton (KD). Five bands were present in hemolymph of all 5 species. 3 bands having molecular weight about 64, 70 and 82 KD, can be hemocyanine subunits, A respiratory protein which have 4 hexamer units with 2 atoms of copper in the center of the molecule. The other 2 similar bands in all 5 species having 150 and 165 KD molecular weight seem to be nonrespiratory proteins. The separated protein patterns suggest that, hemolymph of scorpions had high similarities in protein fractions among Buthidae family but differ from the fractions in Hemiscorpionidae family.

The Osmolarity of hemolymph from Buthidae family are as follow, for Androctonus crassicauda 0.578 ±0.039 mOsmol/kg water, for Mesobuthus eupeus phillipsi 0.588±0.041 mOsmol/kg water, for Hottentota saulcyi 0.570±0.046 mOsmol/kg water and for Hottentota zagrosensis 0.590±0.042 mOsmol/kg water. The osmolarity of hemolymph of Hemiscorpius lepturus from Hemiscorpionidae family is 0.832±0.064 mOsmol/kg water which was the highest amount among 5 species.The pH of hemolymph in 4 species from Buthidae family is 7.3 but the pH of hemolymph of Hemiscorpius lepturus from Hemiscorpionidae family is 7.5.

The amount of hemolymph electrolytes in all 5 species are, sodium 4.6-118 mmol/liter, for potassium 6.3-73 mmol/liter, for calcium 3.6-12.9 mmol/liter and for magnesium 2.3-76 mmol/liter. The protein concentration in the hemolymph of Buthidae family ranging from 75.8 to 102 mg/ml with highest amount for Androctonus crassicauda hemolymph. The protein concentration in the hemolymph of Hemiscorpius lepturus from Hemiscorpionidae family is 102mg/ml.

Key words: Scorpion, Iran, Khuzestan, hemolymph, Hemocyanine, electrolyte, osmolarity, protein, Buthidae, Hemiscorpionidae.