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Biological Activities of Scorpion Venom and Hemolymph from Two Armenian Species

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ABSTRACT

Armenia is home to a rich diversity of unique species. Scorpion venom is a complex mixture of biologically active compounds that has been used in traditional medicine for centuries. Recent studies have confirmed that scorpion venom contains antimicrobial peptides effective against various bacteria. Additionally, it exhibits immunosuppressive and anticancer properties. The aim of this study is to investigate the composition and selected biological activities of venom from two scorpion species native to Armenia. The proteolytic and hemolytic activities of venom and hemolymph from *Mesobuthus caucasicus* and *Androctonus crassicauda* scorpions were analyzed using 12% SDS-PAGE. Protein fractions were separated based on their molecular weight under denaturing conditions. Antibacterial activity of the crude venom, hemolymph, and isolated protein fractions was assessed using the agar diffusion method. The venom and hemolymph of *Mesobuthus caucasicus* and *Androctonus crassicauda* exhibit narrow-spectrum antibacterial activity. Notably, the protein composition of venom and hemolymph differs between the two species. Antibacterial effects are attributed to only two specific protein and/or glycoprotein fractions present in the venom. Furthermore, nutritional status appears to influence the protein profile of both venom and hemolymph. In addition to their antimicrobial properties, the venom and hemolymph also demonstrate proteolytic and hemolytic activities. The venom and hemolymph of *Mesobuthus caucasicus* and *Androctonus crassicauda* demonstrate distinct protein compositions and exhibit significant antibacterial, proteolytic, and hemolytic activities, highlighting their potential for biotechnological and therapeutic applications.

Keywords: *Mesobuthus caucasicus*, *Androctonus crassicauda*, scorpion venom, biological activity

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