Background: Scorpion venom is important and rich source of peptides, most of which have been widely used as pharmacological tools for unraveling structure-function relationship of various ion channels. Naturally occurring toxins can be also considered as lead compounds in the development of novel drugs.
Objectives: In this context, the scorpion-derived peptide neurotoxins specific to sodium channels have shown promise as potential therapeutic targets for the treatment of various human diseases.
Materials and Methods: A cDNA library from the extracted RNA was constructed using RT-PCR and semi-nested RT-PCR. DNA sequencing followed by phylogenetic analysis was applied to screen the cDNA library clones. For molecular characterization of the BMK gene we used cloning and recombinant protein expression techniques based on E.coli systems. Then we performed mice immunization and Western blot and Immunodot analyses.
Results: A novel BMK neurotoxin has been cloned, expressed and characterized from the Iranian scorpion M. eupeus venom. We analyzed the recombinant BMK by immunoblotting with treated antiserum. The result showed that mice antiserum can react also with scorpion crude venom, so is able to recognize native BMK toxin.
Conclusion: The newly produced recombinant protein BMK revealed to be immunogenic. Moreover, anti-BMK antibodies produced in mice were able to recognize both the recombinant BMK neurotoxin and the one in M. eupeus crude venome. Taken together, the molecular characterization and recombinant production of the Iranian scorpion M. eupeus venom component can serve as a new probe for further studies of sodium channels function and physiology. This provides a promising perspective for the future design of selective drugs, as well as for research of antivenom production.
Keywords: Venoms; Neurotoxin; Scorpion; Recombinant Protein