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Characterization of venom proteins of jellyfish *Catostylus* sp. from Beruwala, Sri Lanka

E.A.H.W. Edirisinghe¹, H.R. Algewatta¹, H. Harischandra² and L.D.C. Peiris^{1*}

¹Department of Zoology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka

²Genetics and Molecular Biology Unit, Faculty of Applied Sciences, University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka

Jellyfish venoms are rich sources of bioactive molecules synthesized to capture prey or deter predators. Many of these molecules are proteins with unique properties, which can elicit toxic effects in a local and systemic manner in humans. Therefore, the present study aimed at investigating the potential toxin proteins underlying the significant toxic effects of the crude venom extracted from jellyfish *Catostylus* sp. nematocysts. Jellyfish specimens were collected from the Beruwala coast and identified as *Catostylus* sp. using morphological and molecular approaches. The crude venom extract was prepared by sonicating nematocysts of jellyfish specimens, and the total protein content was estimated using the Bradford assay. The SDS-PAGE was used to determine the molecular weights of proteins in the venom extract. Tryptic digested peptides of the extracted proteins were then analyzed by nano-liquid chromatography-tandem mass spectrometry (nanoLC-MS/MS), and all MS/MS spectra were searched by ProteinPilot software. A total of 13 toxin proteins were identified, in the molecular weight ranging from 4,318 to 184,923 Da, revealing the complexity of *Catostylus* sp. venom. Evaluation of the crude extract showed 12.56 ± 0.07 $\mu\text{g/ml}$ of protein content. The overall protein composition of jellyfish venom was dominated by potassium channel toxin alpha-KTx. Also, toxin proteins phospholipase A2 and A1, small cysteine-rich protein, fragments of snake venom serine protease pictobin, thrombin-like enzyme elegaxobin-1, toxin BmKaTx10, CrTX-A, Turriptide VIII-01, venom factor, and putative antimicrobial peptides were recorded. In conclusion, the significant toxin group of the venom of *Catostylus* sp. was neurotoxin. However, further research to confirm the physiological activities of identified toxin proteins is warranted.

Key words: Jellyfish, *Catostylus* sp., venom proteins, neurotoxins

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E-mail: dinithi@sci.sjp.ac.lk