

## Comparison of protein profiles of medically important vipers in Sri Lanka

R. M. T. N. Perera<sup>1</sup>, Y. B. N. S. De Kostha<sup>1</sup>, C. A. Gnanathan<sup>2</sup>, P. N. Weeratunga<sup>2</sup>

<sup>1</sup>*Institute of Biochemistry, Molecular Biology and Biotechnology, University of Colombo, Sri Lanka*

<sup>2</sup>*Department of Clinical Medicine, Faculty of Medicine, University of Colombo, Sri Lanka*

Snakebite envenomation is a neglected tropical disease causing over 80,000 deaths globally each year. In Sri Lanka, approximately 80,000 bites and 400 deaths occur annually, mostly affecting rural communities. Russell's viper, Hump-nosed pit viper, and Saw-scaled viper are considered as the medically important vipers in Sri Lanka. Accurate identification of the envenomed species remains challenging due to overlapping clinical symptoms and the lack of species-specific diagnostic tools resulting in challenges in patient management. This study compared the protein profiles of the three viper venoms using SDS-PAGE. Crude venom (25 µg) of each viper was electrophoresed with 15% SDS-PAGE under reducing conditions at 60 V for 5 hours alongside pre-stained molecular weight marker (10-250 kDa). Proteins were visualized using Coomassie Brilliant Blue staining. SDS-PAGE analysis resulted in distinct protein banding patterns in all three venoms, and the detected proteins ranged from 10 to 118 kDa. Several conserved and species-specific venom components were identified in protein comparison. Common bands across all species were detected at 83, 39, 21 and 10–12 kDa positions and those could be possibly implicated as L-amino acid oxidase, snake venom metalloproteinase, snake venom serine protease, and phospholipase A2, respectively, consistent with previous literature. Unique proteins observed in Russell's viper ranged from 118 – 106 kDa and 58-68 kDa, in Hump-nosed pit viper between 47–37 kDa and 33–29 kDa, in Saw-scaled viper between 118 - 110 kDa. These differences highlight venom diversity with implications for venom-specific diagnostics and antivenom development.

**Keywords:** *Snakebite, Viper venom proteins, Russell's viper, Hump-nosed pit viper, Saw-scaled viper*

**Acknowledgements:** This work was supported jointly by the MSc program in Cellular and Molecular Immunology, IBMBB, University of Colombo and authors RMTNP.