

Proteomic insights into toxin diversity in Indian *Naja oxiana* venom and investigation of immunoreactivity profiles of two polyvalent antivenoms



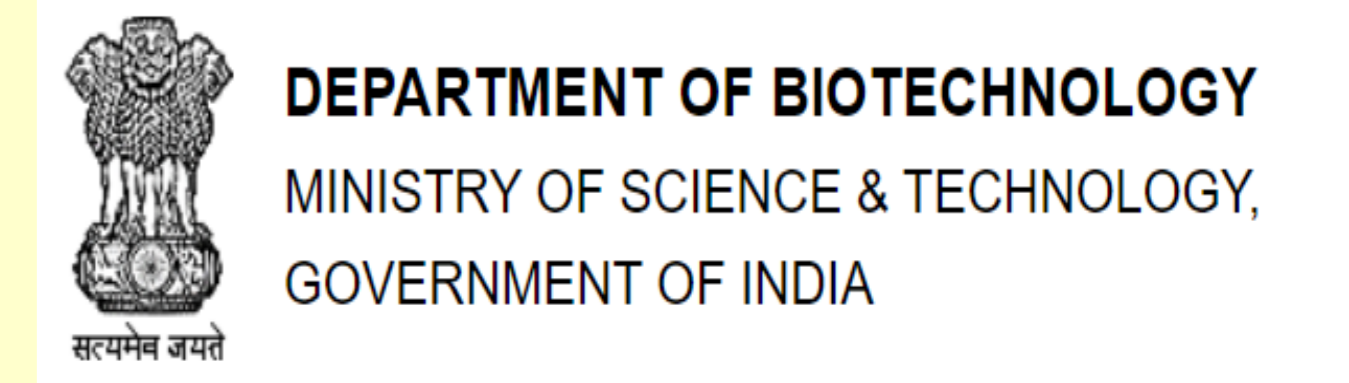
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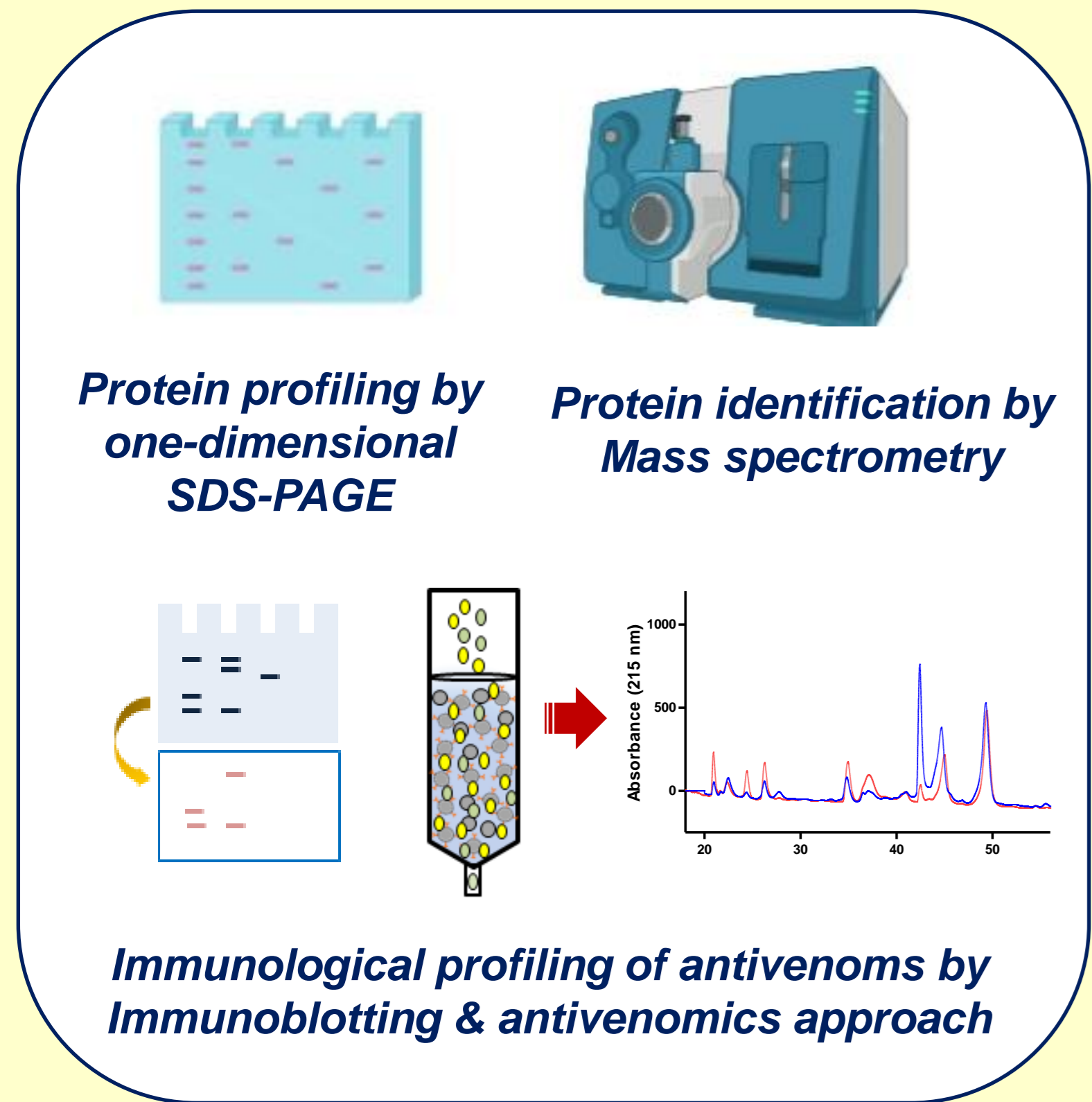
INTRODUCTION

The Central Asian cobra or *Naja oxiana* co-occurs with *Naja naja* in northern part of Pakistan and India. Typical neurotoxic symptoms are displayed in *N. oxiana* envenomings and polyvalent antivenoms are used for treatment of bite victims. The venom composition is known to vary within the same species due to geographical differences, which often leads to inconsistencies in the antivenom neutralization. Owing to such variations, exploration of venom proteomes from various geographical regions is essential for the production of effective antivenoms. The present study is an attempt to unveil the complex proteome of *N. oxiana* of Indian origin and study its immunological cross-reactivity towards commercial antivenoms.



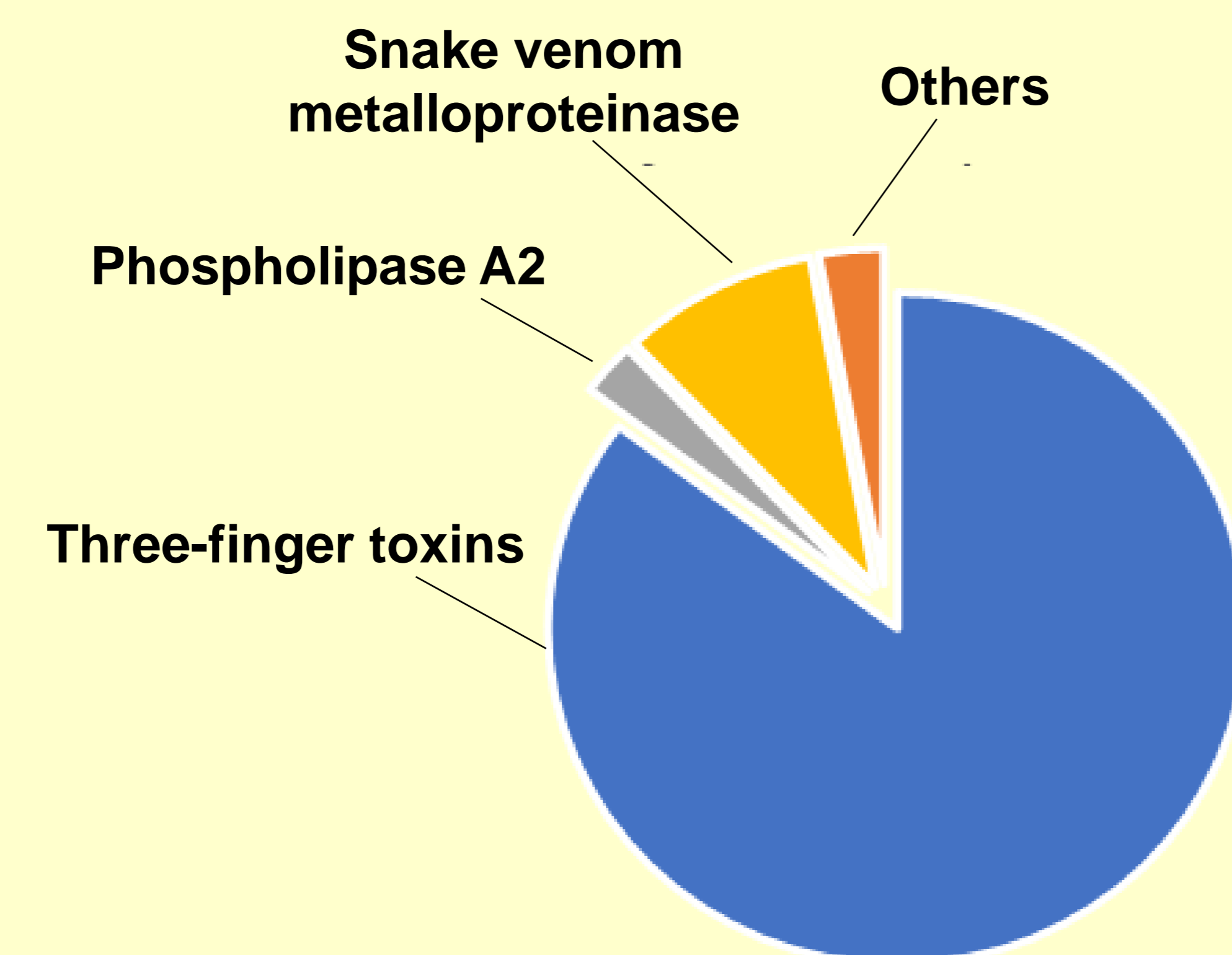
METHODOLOGY

Venom collection

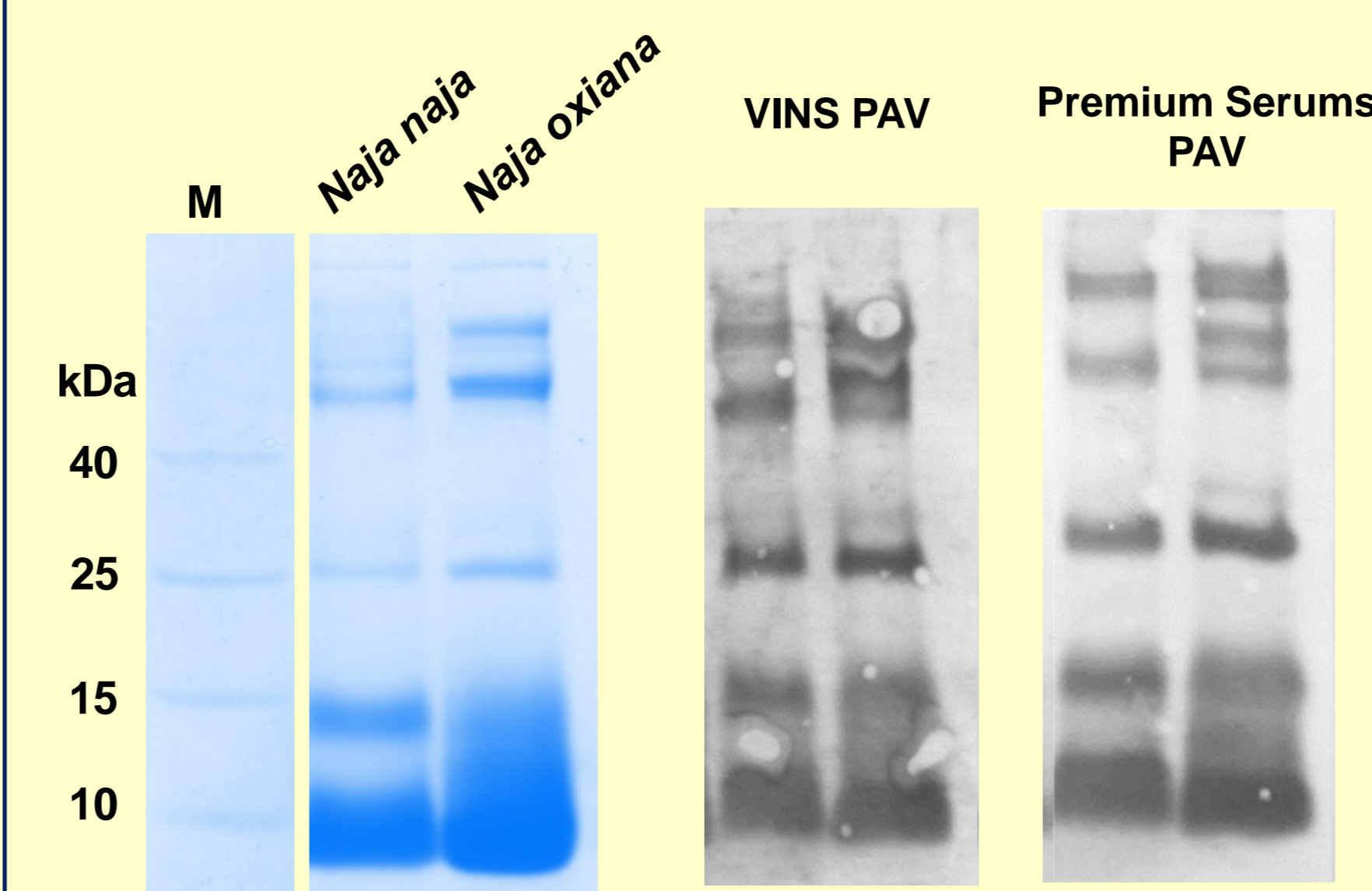


RESULTS

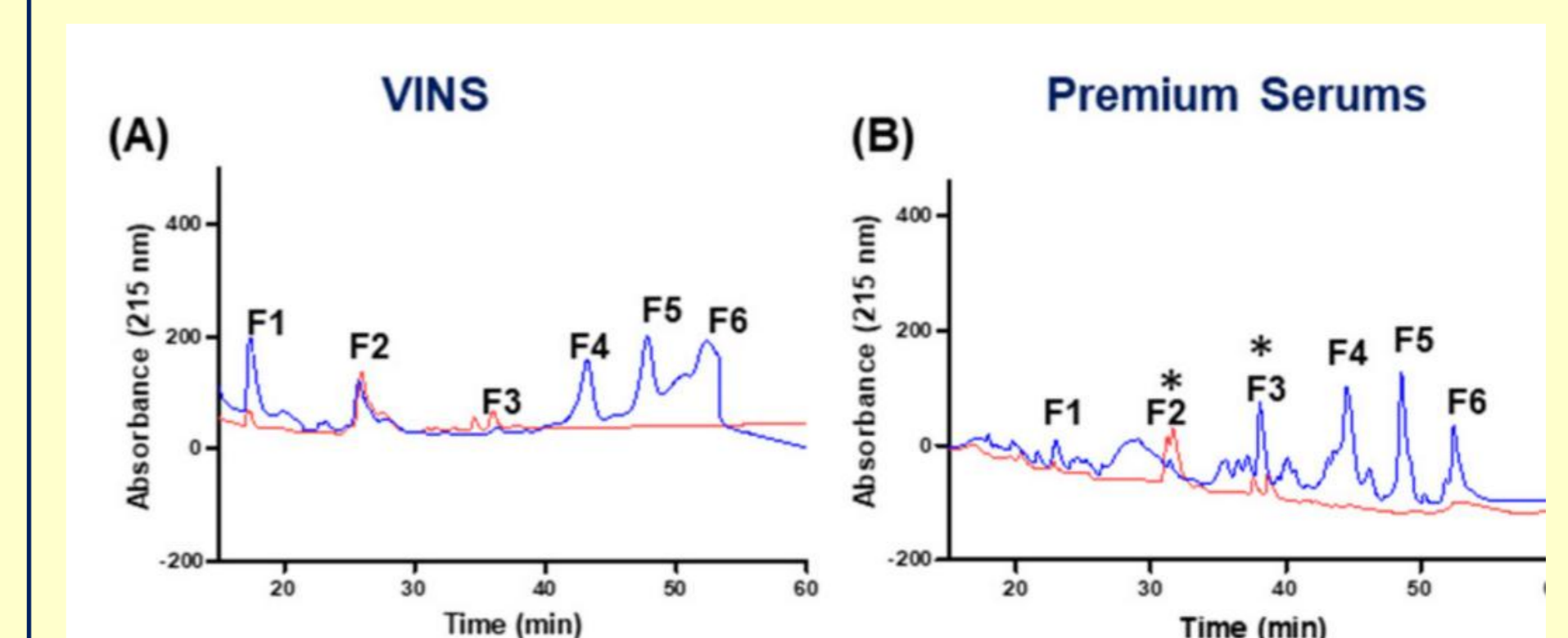
Relative abundances of venom protein families



Immunoreactivity profile of polyvalent (PAV) antivenoms towards *N.naja* and *N.oxiana*



Immunocapturing ability of polyvalent antivenoms towards heterologous venom proteins of *N.oxiana*



CONCLUSION

- ❖ Dominant toxin families includes 3FTx (85.3%) and SVMP (9.1%).
- ❖ Other low-abundance toxin families includes nucleotidases, CRISP, Cobra venom factor, L-amino acid oxidase.
- ❖ SDS-PAGE profile in *N.naja* & *N.oxiana* samples display abundance of protein bands in the 10–15 kDa region.
- ❖ Antivenom recognizes higher mass venom proteins of *N. oxiana*, with lesser recognition of lower molecular weight proteins.
- ❖ PAV-immobilized affinity columns retained majority of *N. oxiana* venom proteins.
- ❖ Non-retained fraction subjected to mass spectrometry identified ten proteins belonging to three-finger toxin family and were categorized as non-immunodepleted.
- ❖ These neglected toxins could possibly limit antivenom efficacy in treating *N.oxiana* envenomings.