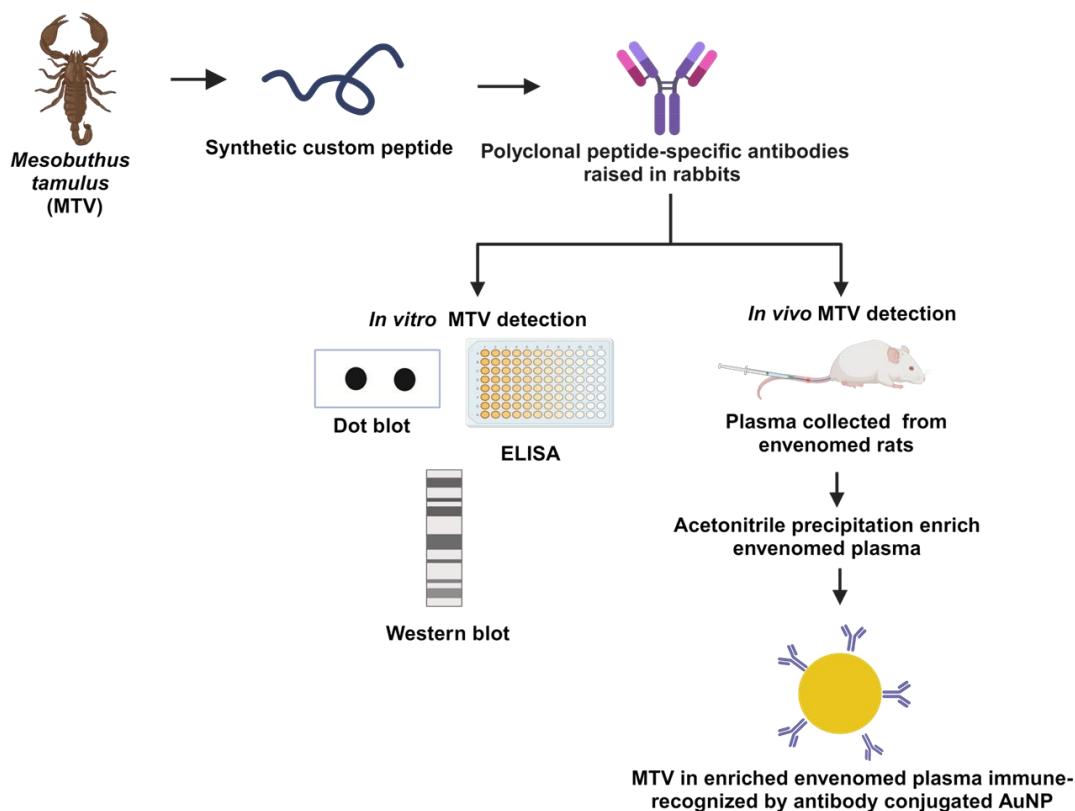


i. **Name of Technology:** ANTIBODIES FOR THE DETECTION OF INDIAN RED SCORPION VENOM AND COMPOSITION THEREOF

ii. **One graphical image:**



iii. **Brief description of the technology:** The present invention provides a composition of antibodies developed against the modified toxin-epitope(s) for scorpion envenomation detection. The present invention also describes a fast, reliable, and effective system for detection of Indian red scorpion (*Mesobuthus tamulus*) venom in human (envenomation in human) as well as any other higher order organisms of commercial importance.

iv. **Details about the technology:** The present invention relates to the invention of an antibody composition/formulation that is able to detect particular venom. Four peptides were designed based on the antigenic epitopes of *Mesobuthus tamulus* venom (MTV) toxins and were used to raise polyclonal antibodies raised against modified toxin-epitope(s) in rabbits. In order to achieve the objects of the present invention, the inventors have come up with four polyclonal antibodies raised against modified

toxin-epitope(s) which are combined in specific ratios. Here PAb denotes the polyclonal antibodies raised against modified toxin-epitope(s) of MTV. The numbers after 'PAb' denote the modified toxin-epitope(s) against which the polyclonal antibodies were raised. The polyclonal antibodies raised against modified toxin-epitope(s) of MTV were analyzed by indirect ELISA and dot blot assay to determine the immune-reactivity towards the MTV which depicted one of the polyclonal antibodies raised against modified toxin- epitope(s) being the best in recognizing the MTV.

The experiments performed show that the polyclonal antibodies raised against modified toxin-epitope(s) when combined in different ratios (wt/wt/wt) among them, the combination of PAb 1+2+3 (1:1:1, wt/wt/wt) and PAb 1+2+3+4 (1:1:1:1, wt/wt/wt/wt) showed superior efficacy in immune-reactivity compared to individual antibodies of the combination/formulation. The composition/formulation of polyclonal antibodies raised against modified toxin-epitope(s)[PAb 1+2+3 (1:1:1, wt/wt/wt)] also showed better immunorecognition for the MTV than the polyclonal antibodies raised against native toxin-epitope(s) (commercial anti-scorpion antivenoms) available, under both in vitro and in vivo conditions. Further PAb 1+2+3+4(1:1:7:1, wt/wt/wt/wt) also shows good immunorecognition. Therefore, polyclonal antibody composition/formulation of PAb 1+2+3 (1:1:1, wt/wt/wt); PAb 1+2+3+4 (1:1:1:1, wt/wt/wt/wt) and PAb 1+2+3+4(1:1:7:1, wt/wt/wt/wt) can be used as a chemical indicators in the development of a method for detection of MTV.

The present invention claims,

1. A composition for detection of Indian Red Scorpion venom comprising: (i) a polyclonal antibody PAb 1, raised against modified toxin-epitope having amino acid sequence CWWVPYGVVSWSEDLPTVPV; (ii) a polyclonal antibody PAb 2 raised against modified toxinepitope having amino acid sequence YISTFNNYSHALSTDC; and (iii) a polyclonal antibody PAb 3 raised against modified toxin-epitope having amino acid sequence SNLRRSELSSRSLGLLGKC.
2. The composition as claimed in claim 1, wherein the ratio of the said polyclonal antibodies in the composition is PAb 1:PAb 2:PAb 3 :: 1:1:1 (wt/wt/wt).
3. The composition as claimed in claim 1 or 2, wherein the composition comprises a polyclonal antibody PAb 4 raised against modified toxin-epitope with amino acid sequence DVKSISSQESWIASKKVC.

4. The composition as claimed in claim 3, wherein the ratio of the said polyclonal antibodies in the composition is PAb 1:PAb 2:PAb 3:PAb 4 :: 1:1:1:1 (wt/wt/wt).

5. The composition as claimed in claim 3, wherein the ratio of the said polyclonal antibodies in the composition is PAb 1:PAb 2:PAb 3:PAb 4 :: 1:1:7:1 (wt/wt/wt/wt).

6. A kit for detection of Indian Red Scorpion venom comprising a PVDF membrane immobilized with unconjugated formulation of polyclonal antibodies as claimed in any of claims 1 to 5 raised against modified toxin-epitope of Indian Red Scorpion venom.

7. A polyclonal antibody raised against modified toxin-epitope having amino acid sequence selected from the group of CWWVPYGVVSWSEDLPTVP, YISTFNNYSHALSTDC, SNLRRSELSSRSLGLLGKC and DVKSISSQESWIASKKVC as claimed in claim 1 or 3.

8. A process for preparation of a polyclonal antibody comprising Fmoc based solid phase synthesis method of the peptides having amino acid sequence selected from the group of CWWVPYGVVSWSEDLPTVP, YISTFNNYSHALSTDC, SNLRRSELSSRSLGLLGKC and DVKSISSQESWIASKKVC as claimed in claim 1 or 3, and injecting the said peptide into animal to generate polyclonal antibody against the specific peptide.

v. **What problem was solved or applicability of the technology:** The present invention aims to overcome the above shortcomings by developing a formulation of modified toxin-epitope-specific antibodies for accurate identification of Indian red scorpion venom for the rapid and efficient diagnosis of the scorpion venom.

vi. **Patent Status:** Granted (Date of grant: 27/03/2025).

vii. **Contact details of the concerned scientist for further information:**

Prof. Ashis K. Mukherjee,

Director, Institute of Advanced Study in Science and Technology, Guwahati.

Email: akm@tezu.ernet.in