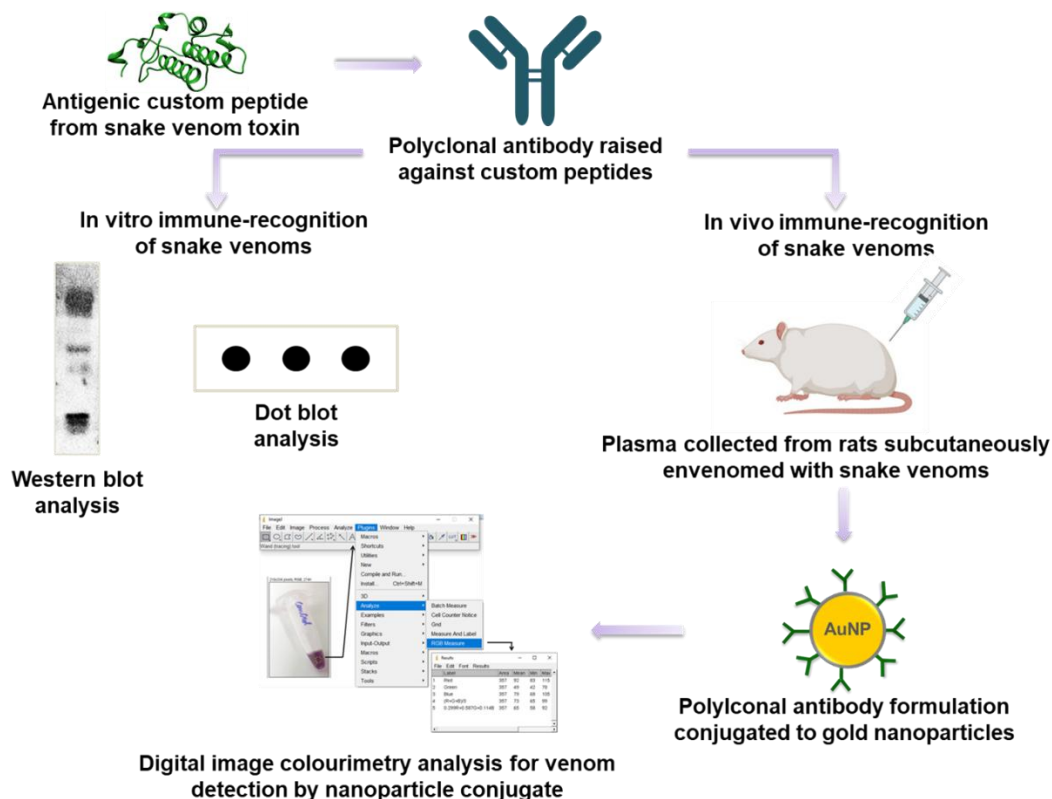


i. **Name of Technology:** ANTIBODIES FOR THE DETECTION OF INDIAN SNAKE VENOMS AND COMPOSITION THEREOF

ii. **One graphical image:**



iii. **Brief description of the technology:** the present invention relates to antibodies raised against modified toxin-epitope(s) developed against species specific toxin(s) of the Indian 'Big Four' snake (*Naja naja*, *Bungarus caeruleus*, *Daboia russelii*, *Echis carinatus*) venom and a novel composition comprising such antibodies for differentiation between venomous snake bite and a dry snake bite in the body fluids of envenomed patients.

iv. **Details about the technology:** The present invention relates to an antibody formulation that is useful in detecting snake venom and identifying a venomous or non-venomous condition. Five peptides were designed based on the antigenic epitopes of Indian 'Big Four' snake venom toxins and were used to raise polyclonal antibodies against modified toxin-epitope(s) in rabbits. Here, PAb denotes the polyclonal antibodies raised against modified toxin-epitope(s). The numbers after 'PAB' denote the modified toxin-epitope(s) against which the polyclonal antibodies were raised.

The experiments performed demonstrated that the formulation of polyclonal antibodies against modified toxin-epitope(s) [PAb 1+2+3+4+5 (1:1:1:1:1, wt/wt/wt/wt/wt)] demonstrated good potential in recognising *Naja naja* (NnV), *Bungarus caeruleus* (KV), *Daboia russelii* (RvV), *Echis carinatus* (EcV), *Naja kaouthia* (NkV) and *Trimeresurus popeiorum* (TpV) under *in vitro* and *in vivo* conditions, thereby signifying its ability of being used for detection of envenomed condition. The combination of PAb 1+2+3+4+5 (1:1:1:1:1, wt/wt/wt/wt/wt) also showed better immunorecognition for the venoms of the NnV, KV, RvV, EcV, NkV and TpV, than the polyclonal antibodies raised against native toxin-epitope(s) (commercial anti-scorpion antivenoms) available.

The present invention claims,

1. A composition for the detection of Indian snake venoms NnV, KV, RvV, EcV, NkV and TpV comprising:
 - (i) a polyclonal antibody PAb 1, raised against modified snake toxin-epitope having amino acid sequence PVDDLDRCCQVHDGGGGNACAASVCDCLAAICFAG;
 - (ii) a polyclonal antibody PAb 2, raised against modified snake toxin-epitope having amino acid sequence TDRCCFVHDCCYGNLGGGGENRICECDKAAAICFR;
 - (iii) a polyclonal antibody PAb 3, raised against modified snake toxin-epitope having amino acid sequence EILVDIVVSEGGGFRSYEIAIRYSECFVLEKQSVFRTWVATP;
 - (iv) a polyclonal antibody PAb 4, raised against modified snake toxin-epitope having amino acid sequence PIDALDRCCYVHDNCYGGGRRTIICYGAAGTCARIVCDCLRTAALCFGD; and
 - (v) a polyclonal antibody PAb 5, raised against modified snake toxin-epitope having amino acid sequence PVDELDRCCYTHDGGGGADTCARFLCDCLRTAAICFASA,

The peptides' amino acids are identified by their universal single letter abbreviations.

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: PAb 4: PAb 5:: 1:1:1:1:1 wt/wt/wt/wt/wt).
3. A process for the preparation of the composition as claimed in claim 1 or 2, wherein the process comprising the steps of:
 - (i) individually synthesising the toxin-epitopes having amino acid SEQUENCE IDs 1, 2, 3, 4 and 5 by Fmoc based solid phase synthesis method of peptides;

(ii) individually raising the corresponding polyclonal antibodies PAb 1, PAb 2, PAb 3, PAb 4 and PAb 5 and extracting the same; and

(iii) mixing the said PAb 1, PAb 2, PAb 3, PAb 4 and PAb 5 antibodies.

4. A composition for the detection of Indian snake venoms comprising:

(i) a polyclonal antibody PAb 1, raised against modified snake toxin-epitope having amino acid sequence PVDDLDRCCQVHDGGGGNACAASVCDCLAAICFAG;

(ii) a polyclonal antibody PAb 2, raised against modified snake toxin-epitope having amino acid sequence TDRCCFVHDCCYGNLGGGGENRICECDKAAAICFR;

(iii) a polyclonal antibody PAb 3, raised against modified snake toxin-epitope having amino acid sequence EILVDIVVSEGGGFRSYEIAIRYSECFVLEKQSVFRTWVATP;

(iv) a polyclonal antibody PAb 4, raised against modified snake toxin-epitope having amino acid sequence PIDALDRCCYVHDNCYGGGRRTIICYGAAGTCARIVCDCLRTAALCFGD; and

(v) a polyclonal antibody PAb 5, raised against modified snake toxin-epitope having amino acid sequence PVDELDRCCYTHDGGGGADTCARFLCDCLRTAAICFASA, wherein the amino acids of the peptides are identified by their universal single letter abbreviations, and wherein the ratio of the said polyclonal antibodies in the composition is PAb 1: PAb 2: PAb 3: PAb 4: PAb 5:: 1:1:1:1:1 (wt/wt/wt/wt/wt); obtainable by the process of (i) individually synthesising the modified toxin-epitopes having SEQUENCE ID Nos. 1, 2, 3, 4, 5 by Fmoc-based solid phase synthesis method of peptides; (ii) individually raising the corresponding polyclonal antibodies PAb 1, PAb 2, PAb 3, PAb 4 and PAb 5 and extracting the same; and (iii) mixing the said PAb 1, PAb 2, PAb 3, PAb 4 and PAb 5 antibodies in the above ratio.

5. A polyclonal antibody raised against modified snake toxin-epitope with amino acid sequence id selected from the group of SEQ ID Nos. 1, 2, 3, 4, and 5.

6. A polyclonal antibody raised against modified snake toxin-epitope obtainable by the method of synthesizing the modified toxin-epitopes selected from the group of toxin-epitope having SEQUENCE ID Nos. 1, 2, 3, 4 and 5 by Fmoc based solid phase synthesis method of peptides; and individually raising the corresponding polyclonal antibodies PAb 1, PAb 2, PAb 3, PAb 4 and PAb 5 and extracting the same.

v. **What problem was solved or applicability of the technology:** The present invention aims to overcome the shortcomings by developing a formulation of toxin-modified epitope-specific antibodies for rapid and accurate differentiation between 'wet' and 'dry' snakebites among the Indian 'Big Four' snakes.

vi. **Patent Status:** Filed (Date of filing: 29/08/2024).

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

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