

RECENT ADVANCES AND PERSPECTIVES ON IMMUNOLOGICAL CONTROL OF TICKS. THE CUBAN EXPERIENCE

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Ticks are blood-sucking ectoparasites that are vectors of infectious agents causing human and animal diseases. They are also cause of great economic losses in the agricultural field. The use of chemical pesticides is the main tool to control ticks. However, the intensive use of these products causes food contamination, environmental pollution and development of resistance by ectoparasites. Current strategies to control ticks are based on the use of integrated control programs (ICP) including an immunogen. This kind of integrated program presents the advantages that are potentially applicable to all genotypes of chemical resistant ticks, are relatively cheap, friendlier with the environment, stable and secure. A Cuban vaccine, Gavac, using Bm86 protein as immunogen, had been used in the last 18 years as ICP in Cuba, Colombia, Brazil, Mexico, and more recently in Venezuela. In all cases Gavac showed effectiveness to control ticks and to reduce the chemical use. The efficacy of this kind of program using immunological control as a tool is linked to a good production practice, technical specialized support and regional policy. In the sense to find new antigens with high efficacy, several groups over the world dedicate their efforts. In order to improve the short term effect of GAVAC, our laboratory had designed and evaluated a peptide of the tick ribosomal protein P0 as an immunogen candidate. The use of the protein P0 for the control of tick infestations is limited by the high degree of amino acid identity to the antigen existing between ticks and mammals. An immunogenic region of the tick ribosomal protein P0 of the *Rhipicephalus* genus was identified as none conserved compared with the host ortholog protein of the host and other mammals including humans. A peptide of 20 amino acids within region showed a high efficacy as a vaccine against infestations of *Rhipicephalus sanguineus* and *Rhipicephalus (Boophilus) microplus* ticks in immunization and challenge experiments in rabbits and cattle. In both experiments, a marked decrease in the tick viability was observed, with more than 90% of efficacy, suggesting the promising possibilities of this peptide for effective control of ticks. This finding could help to improve the efficiency and productivity of the livestock industry and reduce the use of chemicals in agriculture.

Keywords: Tick control, vaccination, P0 protein, Gavac, Bm86.