MOLECULAR CHARACTERIZATION OF THE VITELLOGENIN 3 GENE FROM A MEXICAN Rhipicephalus (Boophilus) microplus TICK STRAIN

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Cattle tick *Rhipicephalus (Boophilus) microplus* is a major problem for cattle producers in tropical and subtropical regions around the world. It causes economic losses due to reduction in weight gain and milk production in cattle. Chemical acaricides have played a major role in controlling *R. microplus* in Mexico; however, their intensive use has led to the development of resistant tick populations within the country. It is therefore necessary to search for alternative products or strategies for tick control. Vaccination has the advantages of being cost-effective, reducing environmental contamination and preventing the selection of drug-resistant ticks which results from repeated acaricide application. In addition, vaccines may also prevent or reduce transmission of pathogens by reducing tick populations and/or affecting tick vector capacity. In this study, we report the molecular characterization of Vitellogenin 3 (*Vg*-3) gene from the Mexican *R. microplus* Media Joya tick strain. Its protein product has already been partially identified by our group, as an antigenic molecule, after immunization of cattle with tick ovary extracts, ELISA, Western blot and LC/MS-MS analyses. Based on the GBBR01000108.1 GenBank sequence, which corresponds to the recently reported *Vg*-3 from the Brazilian *R. microplus* Porto Alegre strain, we designed oligonucleotides for overlapping regions, and amplified and sequenced PCR products in order to obtain the complete encoding sequence. *Vg*-3 cDNA was 5,772 bp in length, which encoded for a protein of 1923 aa, with a calculated molecular weight of 217 kDa and a pI of 7.56. This protein has a 16 aa signal peptide, a single RXXR cleavage signal that would generate two subunits (96 and 121 kDa in molecular weight), a lipoprotein N-terminal and carboxy von Willebrand factor (vWF) type D domains. Ongoing immunization experiments will demonstrate the potential protective efficacy of *Vg*-3 against tick infestations.
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2 Jun 2015
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