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A novel marvelous evolutionary detection: Lack of a large 2888 bp intron region within *HA03* gene from *Hyalomma anatolicum anatolicum*, unlike its commercial recombinant anti-tick orthologue, *Bm86*, from *Boophilus microplus*

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Hyalomma anatolicum anatolicum (*H. a. anatolicum*) as the most widespread tick species in Iran and other parts of the middle east is responsible for the hugely serious economic losses in livestock industry. This study was conducted to investigate genetic variability of the *Bm86* orthologous gene, *HA03*, in five different Iranian *H. a. anatolicum* isolates including Kordan, Qom, Boinzahra, Lorestan and Bushehr. Likewise, a number of *in silico* analyses were performed in order to predict the possible impact of the amino acid substitutions on antigenicity of the protein. Comparative sequence analysis of the *Bm86* orthologous gene sequence among five tick isolates allowed for identification of four non-synonymous single nucleotide polymorphisms (SNPs) including c.995A>C, c.1150G>C, c.1151A>C/T and c.1152G>T which would result in p.Asn 332 Thr, p.Glu 384 Leu and p.Glu 384 Ala substitutions. As much as antigenicity is concerned, based on our *in silico* studies, the amino acid position 384 was located in a putative antigenic peptide of the protein. Our subsequent physicochemical and structural analyses illustrated that two out of three amino acid substitutions including p.Glu 384 Leu and p.Glu 384 Ala considerably influenced the 3-dimensional structure and physicochemical properties of *HA03* protein including hydrophobicity, amphiphilicity and net charge; thus, they might affect the antigen-antibody reaction and consequently immunogenicity of the antigen. In conclusion, it is a rational measure not only to replace *Bm86* with *HA03* in formulation of the recombinant anti-tick vaccine, but also to combine various antigens extracted from different isolates of the tick species.

Biography

Khosrow Aghaiypour Kolyani has completed his PhD from Tehran University of Medical Sciences and Postdoctoral studies from National Institute of Health, National Cancer Institute at frederick, USA. He is the Head of Genomics and Genetic Engineering, Department of Razi Vaccine and Serum Research Institute, which organizes the main human and animal vaccine research in Iran. He has published more than 30 papers in reputed journals and has been serving as an Editorial-Board member of repute.

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