Vaccine Potential of GST-Hl and BrBmcys2c Antigens in a Heterologous Challenge Against the Tick *Rhipicephalus appendiculatus*

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Introduction: *Rhipicephalus appendiculatus*, the brown ear tick, transmits East coast fever, a parasitic disease that kills more than 1 million cattle in Africa by year. Existing tick vaccines are ineffective against this vector, and hence the need to evaluate other vaccine antigens particularly those capable of inducing protection against infestation from multiple tick species with the aim of developing a universal tick vaccine. **Objectives:** Evaluate the potential of two vaccines compose by *Haemaphysalis longicornis* Glutathione S-transferase (GST-Hl) or *Rhipicephalus microplus* cystatin (BrBmcys2a) recombinant antigens against *R. appendiculatus* infestation. **Material and Methods:** Sequence similarity of GST-Hl and BrBmcys2a between their homologues in *R. appendiculatus* was determined *in silico*. Recombinant GST-Hl and BrBmcys2a were obtained by *Escherichia coli* expression and further affinity chromatography purification. Rabbits (3 per group) were inoculated with 100 µg of recombinant proteins or PBS, in case of the control group, 3 times at 2 weeks intervals. *R. appendiculatus* nymphs and adults were allowed to feed on the animals and tick feeding and survival were monitored. **Results and Discussion:** GST-Hl is 82.5% identical to *R. appendiculatus* GST, while two cystatins from *R. appendiculatus* are 38.2-39% identical to BrBmcys2a. Vaccination with rGST-Hl decreased the engorged weight (22.7%) and survival (11.5%) of adult females. Cystatin-vaccinated group showed reduction in the engorgement period and survival (12.5%) of adult females. No statistical difference was observed in the nymph number or weight for both group. The results of vaccinating with rGST-Hl are consistent with previous studies indicating partial protection for different tick species. The overall efficacy for both vaccinated groups will be determined after evaluating egg yield and hatch rates. **Conclusions:** The recombinant GST-Hl and BrBmcys2a are potential antigens to compose a cross specie vaccine, by reducing tick infestation and transmission of tick borne diseases.

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