A preliminary study on the DNA-vaccine for chicken protection against tick *Argas persicus* (Oken, 1818)

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Makram A. Sayed* Kawther M. El Kammah and Zaki A. El-Fiky*****
* Plant Protection Department, Faculty of Agriculture, Cairo University, Fayoum Branch, Egypt.
** Agricultral Zoology Department, Cairo University, Faculty of Agriculture, Egypt.
*** Genetics Department, Faculty of Agriculture, Cairo University, Fayoum Branch, Egypt.

ABSTRACT

The percent tick rejection upon feeding on DNA-immunised chicken had fluctuated between 74.64 ± 6.33 and 89.39 ± 3.15%. The reaction between the DNA-vaccinated chicken serum and the tick salivary gland proteins by enzyme linked immuno sorbent assay (ELISA) was positive and ranged between 0.190 ± 0.01 and 0.306± 0.012 absorbency units (AU) for the doses 200 and 800 µg DNA/kg chicken body weight, respectively. The check control was 0.139.± 0.017 AU. On the other hand, no positive reaction was detected by using the same chicken sera and Hyalomma dromedarii salivary gland proteins as non-specific antigen. There were positive reactions through ELISA against the gut proteins of A. pericus in sera collected after the first injection compared to the control group. After the second injection, the most significant effect was recorded for the vaccine DNA concentration 200 µg (0.375 ± 0.02 AU), then 1000 µg (0.269 ± 0.037 AU) and 600 µg (0.228 ± 0.011 AU). The concentration of 400 µg also increased the immune response of the chicken against the gut proteins after the fourth week, when the titration absorbance was 0.516 ± 0.014 AU compared with the control 0.077 ± 0.015 AU. The absence of non-specific reaction against the H. dromedarii gut protein proved that the antibodies in the serum of the DNA vaccinated chicken were specific for the A. persicus gut proteins. The electrophoretic pattern of the immunized chicken serum showed three new protein bands at the R_f 0.089, 0.0163 and 0.369 with molecular weights 225, 170 and 83 kDa, respectively. These protein bands indicated the development of the immune defense of the chicken against ticks.

Key words: *Chicken tick, Argus persicus, tick control, DNA-vaccine.*

INTRODUCTION

Protein-based immunization is at the basis of the well-established public health measure of vaccination. In 1993, a report of the World Bank concluded unambiguously that vaccination is the most cost-effective public health measure available. Scientific progress is founded - more frequently than imagined - on methodological innovation. Thus, when the occasional revolution in vaccine methodology comes along, it is worth taking a serious look. New methods, in the hands of creative investigators, has led to new experimental approaches which give rise to new concepts and, occasionally, produce shifts in paradigms. Such a methodological leap would appear to have occurred with the advent of DNA-mediated immunization, now colloquially known as