

## ABSTRACT

The Phytoacaricidal activity of Neem Bark and Leaf Extracts on *Boophilus microplus* and its participation in modulating the Host's Acquired Immunity

Shyam Shastri Maharaj

Non-target toxicity and the rapid development of pest resistance continue to be major shortcomings of traditional chemical treatments for pests such as *Boophilus microplus*. Eco-friendly approaches to pest control that are less susceptible to resistance mechanisms such as plant-derived pesticides and immunological control are areas being investigated for alternatives.

In this thesis two such alternatives for the control of *B. microplus* were examined. Firstly hexane extracts of neem bark and leaves were evaluated via an immersion bioassay and field trials. The second approach was the manipulation of host responses to *Boophilus microplus* and its products. Host responses were analysed including the comparison of natural infestation by *B. microplus* and immunisation with its extract.

The hexane neem bark extract displayed superior acaricidal activity with 100% mortality *in vitro* and 65% mortality in field trials. Post treatment challenge of animals demonstrated similar protection both in cases of natural infestation and

immunisation. Immunological analysis showed that the mechanism of protection was different in each case. Electrophoresis showed similarities in the composition of larval and adult extracts of *B. microplus* in the region of 18 to 60 Kda. The positive results obtained show promise for further development and use of both alternatives in the control of *B. microplus*.

**Keywords:** Shyam Shastri Maharaj; *Boophilus microplus*; Neem bark and leaf extracts; plant-derived pesticide; immunisation ; natural infestation.