

Acaricidal Black plum mediated Magnesium Oxide Nanoparticles against *Rhipicephalus* and *Hyalomma* Ticks

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ABSTRACT

Ticks (Acari: Ixodidae) are blood-feeding parasites, capable of transmitting important diseases of animals and humans. The non-judicious use of chemical acaricides has led to the development of acaricide-resistant ticks, making the control of ticks and tick-borne diseases difficult. This study reports the use of *Syzygium cumini* (black plum) leaves as reducing agent in green synthesis of magnesium oxide nanoparticles and their *in vitro* application against *Hyalomma* and *Rhipicephalus* ticks as a green alternative to conventional acaricides. UV *vis* spectrometry revealed the absorbance and wavelength of 294 nm, combined with other nanoparticle quantitation assays. The *in vitro* bioassays included Adult immersion test (AIT), Adult packet test (APT), Larval immersion test (LIT) and spray tests employing leaf extracts and black plum mediated Magnesium Oxide Nanoparticles (B-MgO NPs) at different concentrations. The LC₅₀ of B-MgO NP were 10.42 mg/L, 10.68 mg/L and 9.97 mg/L, 10.03 mg/L for larval and adult stages of *Hyalomma* and *Rhipicephalus* ticks respectively. To the authors best of knowledge, this study reports first use of plant mediated MgO NP for toxicity in adult and larval stages of hard tick species. The study provides an eco-friendly and safer acaricidal alternative to prevent ticks and tick-borne diseases.

Keywords: Green, MgO nanoparticles, ticks, vectors, toxicity