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Impact of the botanical insecticide Neem Azal on survival and reproduction of the biting louse *Damalinia limbata* on angora goats.

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Abstract

Secondary metabolites present in the neem tree (*Azadirachta indica* A. Juss, Meliaceae), exhibit a wide range of biological activities in insects. However, few studies have been undertaken to assess the potential of neem products as insecticides for the control of ectoparasites of domestic animals. This study was undertaken to estimate the efficacy of Neem Azal, an azadirachtin-rich extract of neem seeds, in controlling *Damalinia limbata* (Phthiraptera) louse infestation of angora goats. The study was conducted on a fibre animal farm situated in Central Italy. Groups of 11-12 goats were treated with Neem Azal at an azadirachtin concentration of 650ppm or 125ppm, with Néguvon or were left untreated. Their louse burden was assessed fortnightly to monthly for 22 weeks. A reduction in louse densities of 76-96% was observed from week 2 to week 18 after treatment with the neem solution containing azadirachtin at a concentration of 650ppm. At the lower test concentration (125ppm) a reduction of 60-92% could be recorded from week 2 to week 14. Neem Azal was found to reduce the survival of both adult and nymph stages of *D. limbata* and to interfere with oviposition and oogenesis of female lice. A decrease in oviposition was observed in neem exposed female lice and the examination of their ovaries revealed morphological alterations in both vitellogenic and previtellogenic ovarioles at the follicular and germinal level. Since neem compounds target different life stages and physiological processes of *D. limbata*, the development of insecticide resistance by biting lice exposed to neem-based insecticides appears unlikely. For this reason and for its prolonged activity, which in principle allows angora goats to be protected for a large part of the mohair production cycle, neem-based insecticides may have a potential interest for mohair producing breeders.