RESUMO SIMPLES - ECTOPARASITOS: SISTEMÁTICA, EPIDEMIOLOGIA E CONTROLE

EFEITO DOS ÓLEOS ESSENCIAIS DE ORIGANUM VULGARE (L.) E THYMUS VULGARIS (L.) E DOS COMPOSTOS ISOLADOS CARVACROL E TIMOL EM STOMOXYS CALCITRANS, A MOSCA DOS ESTÁBULOS.

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Stomoxys calcitrans, the stable fly, is an obligatory hematophagous insect. Both sexes, males and females feed on blood for survival and reproduction. It is an ectoparasite of livestock worldwide, with a preference for bovine blood. Its parasitism reduces the animals' health and well-being, as the bite is painful. The stable fly is a mechanical vector of several pathogens, causing major economic losses to the meat and dairy industries. Insecticides are routinely used to control the ectoparasite S. calcitrans, which leads to significant environmental problems, such emergence of populations resistant to various classes of insecticides and the environmental deposition of these chemical products. Plant-derived essential oils present alternatives to the use of insecticides in controlling these insects, with the advantage of being environmentally friendly. The present study aims to evaluate the effects of the essential oils of Origanum vulgare L. and Thymus vulgaris L. on S. calcitrans and their main respective

constituents, carvacrol and thymol. These compounds, at different concentrations, were applied topically to the flies' abdomen to monitor their longevity, comparing male and female longevity after topical application and monitoring behavior. The lethal dose for 50% (LD50) and 90% (LD90) were calculated. Two hundred and fifty adult flies, 24 hours after emergence, were anesthetized in a Petri dish placed on ice. With the abdomen facing upwards, 1 microliter of the essential oils of thyme and oregano, as well as of the major compounds carvacrol and thymol, was applied to the flies' abdomen. They were kept in cages with 8 male and female flies in a 1:1 ratio, in each cage containing groups with concentrations of 500 ppm, 1000 ppm, 2500 ppm, 3500 ppm, 5000 ppm, 7500 ppm, 10000 ppm, 20000 ppm, 35000 ppm, in addition to the control group treated only with acetone. The flies were fed with bovine blood throughout the experiment. Longevity after topical application was monitored daily. The higher concentrations, such as 2500 ppm, 20000 ppm, 35000 ppm, killed all 8 flies within 24 hours, while the lower concentrations, 3500 ppm and 4000 ppm, showed a survival pattern like the acetone control group for 28 days, demonstrating the dose-dependent action of the essential oils. A difference between sexes was observed, as males died more quickly than females at the higher concentrations and at the intermediate concentration.The LD50 and LD90 of the essential oils of oregano and thyme, and of the major compounds, were calculated. For oregano, the values were 4424.65 ppm and 12721.48 ppm after 24 hours, and 3366.03 ppm and 8690.35 ppm after 48 hours. For thyme, the values were much higher: 32178.12 ppm and 254511.5 ppm after 24 hours, and 65575.63 ppm and 1168381 ppm after 48 hours. For the major compounds, LD50 and LD90 values for carvacrol were 11692.35 ppm and 52637.22 ppm after 24 hours, and 16313.06 ppm and 105557.9 ppm after 48 hours. Thymol showed better results, with lower LD50 and LD90 values: 1823.61 ppm and 4169.82 ppm after 24 hours, and 1330.05 ppm and 3327.6 ppm after 48 hours. Behavioral changes in the flies, such as leg and wing movements and loss of balance, were observed after treatment with the essential oils and their main components (Costa et al., 2023). Based on our results, essential oils and their major compounds may constitute a promising alternative to commercial insecticides used in the control of the stable fly. As future perspectives, the impact of these compounds on the life cycle of S. calcitrans will be investigated, monitoring reproductive parameters such as oviposition, fertility, and fecundity. Subsequently, a pharmaceutical formulation will be produced with the compound that shows the performance for in vivo application.

Palavras-chave: oregano; ectoparasita; tomilho; bioinseticida; formulação.