Chemical composition and efficacy of some selected plant oils against Pediculus humanus capitis in vitro

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Abstract:

Natural compounds have been suggested as alternative sources for pediculosis capitis control. We aimed to investigate the chemical composition and evaluate the pediculicidal activity of spearmint, clove, cassia, thyme, eucalyptus, and anise essential oils in addition to sesame oil against human head lice in vitro. A filter paper contact bioassay method was used by applying 0.25 and 0.5 mg/cm² of each tested oil to filter paper in Petri dishes with 15 females head lice and another with ten nits. The lice mortalities were reported every 5 min for 180 min. The percentage of inhibition of hatch (PIH) was used to calculate ovicidal activity by daily microscopic inspections 5 days after the hatching of controls. Comparison with the widely used pediculicide (malathion) was performed. The most effective essential oil was spearmint followed by cassia and clove with KT50 values of 4.06, 7.62, and 12.12 at 0.5 mg/cm² and 8.84, 11.38, and 19.73 at 0.25 mg/cm², respectively. Thyme, eucalyptus, and anise were also effective adulticides with KT50 values of 18.61, 32.65, and 37.34 at 0.5 mg/cm² and 29.92, 43.16, and 45.37 at 0.25 mg/cm², respectively. Essential oils were also successful in inhibiting nymph emergence. Spearmint oil was the most effective, with a complete inhibition of emergence at 0.5 mg/cm². Sesame fixed oil did not show any adulticidal or ovicidal activity against head lice in vitro. The observed insecticidal activity was comparable to malathion. The results herein described the effectiveness of these essential oils as potential pediculicides for head lice control. Incorporation of essential oils in pediculicide formulations needs proper formulation and clinical trials.

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