

NEMATICIDAL EFFECT OF LIMONENE ESSENTIAL OIL ON *Caenorhabditis elegans*

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INTRODUCTION: Intestinal parasitic diseases represent a persistent and significant public health concern, affecting billions of individuals worldwide and disproportionately impacting vulnerable populations. The extensive use of conventional anthelmintic drugs has contributed to the emergence of resistant strains, signaling the urgent need for novel and effective therapeutic alternatives. In this context, natural compounds such as limonene, a monoterpene found in citrus essential oils, have attracted interest due to their potential activity against nematodes. The nematode *Caenorhabditis elegans* is widely used as an experimental model because of its ease of handling, short life cycle, fully sequenced genome, and high genetic similarity to parasitic species of medical relevance. **OBJECTIVE:** To evaluate the effects of limonene essential oil on the viability, reproduction, larval development, and motility of *Caenorhabditis elegans*, with emphasis on its potential nematicidal activity. **MATERIALS AND METHODS:** Worms from the CB3474 strain *ben-1(e1880)III*, which are resistant to Benzimidazole, were chronically exposed to three concentrations of limonene (0.005%, 0.05% and 0.1%) for 48 hours. Following exposure, survival rate, egg laying, brood size, motility, and developmental stage were assessed. **RESULTS AND CONCLUSION:** Exposure to limonene essential oil led to a reduction in survival at the intermediate and highest concentrations, indicating dose-dependent toxicity. The highest concentration also affected egg laying and brood size, suggesting impairment of reproductive function. The development of the nematode, assessed through body length and area, showed significant effects at the two highest concentrations tested. Furthermore, survival and motility were reduced at concentrations of 0.05% and 0.1%, the same results observed for the wildtype strain (data not shown). These findings demonstrate the nematicidal potential of limonene even in the resistant strain, with significant effects on physiological parameters, supporting its potential use as an alternative for nematode control. However, further studies are needed to clarify its mechanisms of action, assess its safety, and confirm its efficacy in parasitic models.

KEYWORDS: Intestinal parasitic diseases; Natural compounds; Anthelmintic