ACTIVITY OF KAFFIR LIME (*CITRUS HYSTRIX*) ESSENTIAL OIL AGAINST BLOW FLIES AND HOUSE FLY

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Abstract. Blow flies and the house fly are not only pests but can be carriers of human pathogens. We aimed to determine the activity of the essential oil (EO) of the peel of Kaffir lime (*Citrus hystrix*) against 3 species of blow flies (*Chrysomya megacephala*, *Chrysomya rufifacies* and *Lucilia cuprina*) and the house fly (*Musca domestica*) in order to develop a plant derived method to control these pests. Larvicidal and adulticidal efficacy of *C. hystrix*'s EO were evaluated by dipping method and topical application, respectively. The EO studied gave lethal concentration 50 (LC_{50}) =38.93 g/l against *M. domestica*, a LC_{50}=61.00 g/l against *L. cuprina*, a LC_{50}=66.39 g/l against *C. rufifacies* and a LC_{50}=71.00 g/l against *C. megacephala*. Among female flies studied EO gave a lethal dose 50 (LD_{50}) =83.50 μg/fly against *M. domestica*, a LD_{50}=124.03 μg/fly against *C. megacephala*, a LD_{50}=210.46 μg/fly against *L. cuprina* and a LD_{50}=408.63 μg/fly against *C. rufifacies*. Scanning electron microscopy of the studied flies showed the studied EO resulted in a swollen, corroded integument with bleb formation. Light microscopy revealed a deformed midgut and hindgut and the fat cells having a vacuolated appearance. There was also a decrease in the number of nuclei in the fat cells and there were degeneration of the nuclei. Gas chromatography-mass spectrometry (GC-MS) evaluation of the studied EO revealed twenty-one compounds obtained by steam distillation. The major constituents were β-pinene (24.62%), sabinene (22.06%), limonene (19.29%), and citronellal (10.58%). Kaffir lime EO appears to be a potential candidate for further development as a plant derived method to control medically important fly species.

Keywords: *Citrus hystrix*, essential oil, blow flies, house fly, toxicity

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INTRODUCTION

Blow flies and house flies are not only pests but can spread human pathogens, such as bacteria, viruses, protozoa and helminth eggs (Greenberg, 1973; Sukon-