

Full Length Research Paper

Chemical characterization of Kenyan *Cupressus lusitanica* Mill., *Ocimum americanum* L. and *Lippia javanica* (Burm.f.) Spreng essential oils

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The study was designed to chemically characterize essential oils from Kenyan *Cupressus lusitanica*, *Ocimum americanum* and *Lippia javanica* and bio-prospect for new compounds as possible biocontrol agents of insect pests. Leaf essential oils of the three test plants were obtained by hydro-distillation. GC-MS analysis of leaf oils revealed that monoterpenes were the major group of chemical constituents in all plants. In *C. lusitanica* oil, 91 compounds were identified with α -pinene (13.8%), umbellulone (12.66%), δ -cadinene (7.47) and Limonene (6.64%) being major compounds. The *O. americanum* oil had 72 compounds with geraniol (18.72%), 1, 8- cineole (17.48%), elemicin (8.20%) and camphor (7.55%) being main chemical constituents. Results also in *L. javanica* oil, the 47 compounds identified were dominated by ipsdienone (26.07 %), ocimenone (14.32%), bicyclo [3.1.1] hept-3-en-2-one, 4,6,6-trimethyl-, (1S)-(10.91%) and myrcene (7.04%). The chemotypes of essential oils from the tested plants may be considered as α -pinene-umbellulone, geraniol-1, 8-cineole and ipsdienone-ocimenone for *C. lusitanica*, *O. americanum* and *L. javanica* respectively. The chemical constituents such as α -pinene, umbellulone, geraniol, 1, 8-cineole and myrcene are known to have insecticidal properties. Therefore, the essential oils have possible uses in production of natural pesticides of plant origin for sustainable management of insect pest.

Key words: Essential oil, *Cupressus lusitanica*, *Ocimum americanum*, *Lippia javanica*, botanical pesticide.

INTRODUCTION

Essential oils are secondary plant metabolites that defend plants directly or indirectly against microorganisms and herbivores (Isman et al., 2011; Regnault-Roger et al., 2012; Isman, 2020). Many researchers have reported that essential oils mainly consist of monoterpenes,

sesquiterpenes, phenylpropanoids, alcohols, esters, aldehydes, ketones, among others (Castillo et al., 2009; Bett et al., 2016). Furthermore, plants belonging to the families of Annonaceae, Asteraceae, Apiaceae, Chenopodiaceae, Cupressaceae, Lauraceae, Lamiaceae,

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