

Abstract

Ethnopharmacologically, *Tagetes minuta* has a lot of applications in the history of human life. The study aimed at characterizing the essential oil from fresh aerial parts of *T. minuta* and evaluating its repellent effect on the host-seeking female *Anopheles arabiensis* mosquitoes, the vector of African malaria. The oil was obtained by hydrodistillation and analyzed by gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS). Compounds were identified by comparison of their mass spectra with those in Wiley NBS and NIST databases and GC retention times to those of authentic samples. The repellent effect of the essential oil was evaluated using a human-bait technique to simulate field situation. The percentage yield of the essential oil of *T. minuta* was 0.00029 % w/w with a specific gravity of 0.8953 mg/ml. The oil showed a complex composition of about 119 hydrocarbon compounds and may be richer in monoterpenes (47.90 %) than in any other type of compounds. The main principal constituents of the essential oil of *T. minuta* included: ocimene, dihydrotagetone, tagetones, ocimenones, piperitenone, 3,9-epoxy-p-metha-1,8(10) diene, β caryophyllene, bicyclogermacrene and AR-turmerone. Some of these constituents reported in literature have shown insecticidal, acaricidal, pesticidal and/or repellent properties. Although not manifesting a clear general trend, the essential oil however showed a significant dose-response effect of repellency ($p < 0.05$). More mosquitoes significantly landed and bit the control arm treated with vaseline pure petroleum jelly than the arm treated with the essential oil of *T. minuta* ($p < 0.05$), thus showing repellency properties of the oil against *An. Arabiensis* mosquitoes. Nevertheless, the underlying mechanism of repellency remains unknown. However, the oil may represent a potentially new, most practical and economic way and readily available and applicable malaria vector control tool for incorporation into integrated vector management strategies and contribute to the provision of prophylactic measures, particularly at an individual level.