

Excito-repellency of *Myristica fragrans* Houtt. and *Curcuma longa* L. extracts from Southern Thailand against *Aedes aegypti* (L.)

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ABSTRACT

The development of local plant extracts as a mosquito repellent is environmentally safe, inexpensive, and easily accessible for residents. In this study, three extracts from two local plants, *Myristica fragrans* Houtt. (flesh and mace) and *Curcuma longa* L. (rhizome) from southern Thailand, were investigated for their inherent repellent activity using the excito-repellency (ER) assay system against insectary-colonized *Aedes aegypti* (L.) (Diptera: Culicidae). The escape responses of mosquitoes exposed to concentrations of 0.5% to 5.0% (w/v) were measured to determine the contact irritant and non-contact repellent properties of each extract. Both the flesh and mace extracts of *M. fragrans* had relatively limited contact irritants (28.1% and 34.6% escape) and non-contact repellent (16.7% and 18.3% escape) activities against *Ae. aegypti*, respectively. The *C. longa* rhizome extract produced higher escape responses in the non-contact (42.6% escape) and contact (41.4% escape) trials at concentrations of 5.0% and 1.0%, respectively. GC-MS analysis found diethyl malate (56.5%) and elemicin (11.7%) to be the main components of the flesh and mace extracts, respectively, while ar-turmerone (24.6%), β -turmerone (15.2%), α -turmerone (10.5%) were the primary constituents of the rhizome extract. Overall, our results indicate that both *M. fragrans* extracts primarily caused *Ae. aegypti* escape through contact irritation. For *C. longa*, lower concentrations (0.5% and 1.0%) exhibited contact irritancy, but higher concentrations (2.5% and 5.0%) exhibited non-contact repellency against *Ae. aegypti*. Although they had limited efficacy, further experiments (e.g., mixing with other plant-based compounds) could enhance the ER of both local plant extracts. Additional evaluation of these extracts against other mosquito species and the ER of their chemical components, either alone or in combination, would also be beneficial for the development of green repellents. Our findings emphasize the possibility of utilizing plant-based mosquito repellent as an alternative personal protection method for future mosquito control programs.

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