

IN VITRO AND IN VIVO ANTI-PLASMODIAL ACTIVITY OF ESSENTIAL OILS, INCLUDING HINOKITIOL

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Abstract. The anti-plasmodial activity of 47 essential oils and 10 of their constituents were screened for *in vitro* activity against *Plasmodium falciparum*. Five of these essential oils (sandalwood, caraway, monarda, nutmeg, and *Thujopsis dolabrata* var. *hondai*) and 2 constituents (thymoquinone and hinokitiol) were found to be active against *P. falciparum* *in vitro*, with 50% inhibitory concentration (IC₅₀) values equal to or less than 1.0 g/ml. Furthermore, *in vivo* analysis using a rodent model confirmed the anti-plasmodial potential of subcutaneously administered sandalwood oil, and percutaneously administered hinokitiol and caraway oil against rodent *P. berghei*. Notably, these oils showed no efficacy when administered orally, intraperitoneally or intravenously. Caraway oil and hinokitiol dissolved in carrier oil, applied to the skin of hairless mice caused high levels in the blood, with concentrations exceeding their IC₅₀ values.

Keywords: antiplasmodial activity, essential oils, *in vitro*, *in vivo*

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