# A comparative study on essential oil yield, chemical composition and antimicrobial activity of essential oils from *Ocimum* species cultivated in Vietnam

**Nguyen Q. Tin[1*], Nguyen H. Hai[2], Le D. Chac[3] and Tran T. Huyen[3]**

[1]*Department of Science and Technology, Ministry of Agriculture and Environment, Hanoi, Vietnam*
[2]*Plant Resources Center, Vietnam Academy of Agricultural Sciences, Hanoi, Vietnam*
[3]*Faculty of Agriculture Forestry and Fisheries, Hong Duc University, Thanh Hoa, Vietnam*
**Email: nguyentin2285@gmail.com*

*Receipt: 25.02.2026* *Revised: 02.04.2026* *Acceptance: 04.04.2026*
**DOI:** https://doi.org/10.53552/ijmfmap.12.1.2026.156-165


## ABSTRACT

*This study comparatively evaluated the essential oils of Ocimum tenuiflorum, Ocimum gratissimum, and Ocimum basilicum cultivated in Hanoi, Vietnam. The aerial parts were subjected to hydrodistillation, and the resulting oils were analyzed by GC–FID/MS. Essential oil yields varied significantly among species, ranging from 0.84% (O. tenuiflorum) to 1.42% (O. gratissimum). Chemical profiling revealed distinct chemotypic patterns: O. tenuiflorum was dominated by methyl eugenol (56.28%) with eugenol (15.06%); O. gratissimum by eugenol (62.07%) and germacrene D (15.17%); and O. basilicum by methyl chavicol (51.45%) and linalool (18.41%). Antimicrobial activity assessed by the broth microdilution method demonstrated that O. gratissimum exhibited the strongest inhibitory effects, particularly against Staphylococcus aureus (MIC 50 µg/mL) and Candida albicans (MIC 50 µg/mL), whereas O. tenuiflorum and O. basilicum showed moderate activity. Overall, the findings confirm that species identity and chemotype strongly influence essential oil yield, chemical composition, and antimicrobial performance under identical cultivation and extraction conditions.*

***Keywords:*** Antimicrobial activity, essential oil, *Ocimum basilicum*, *Ocimum gratissimum*, *Ocimum tenuiflorum*,