



Research Article

Chemotaxonomy of *Vitex negundo* L. essential oil from six states of the north-central geopolitical zone of Nigeria

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ABSTRACT

Vitex negundo L., has been associated with a number of pharmacological activities, including enzyme inhibition, antifeeding action, larvicidal activity, and mosquito repellent effect. Between June and September, 50 kg of plant material each were collected from six states in the North-Central geopolitical zone to explore the chemotaxonomical variation of the *V. negundo* essential oil yield and composition. For extraction, a custom-designed essential oil plant based on the steam distillation principle was employed, and for characterization, a Varian CP-3800 gas chromatograph with an HP-5 capillary column was used. Essential oil yields varied from 0.03 to 0.48% depending on weather factors and soil substructure type. Niger and Kogi samples had the largest and lowest essential oil production, respectively. Furthermore, the yields from Nassarawa, Plateau, and Kwara did not differ substantially ($p > 0.05$). The volatile oils had a wide range of compositions, according to GC-MS studies. Monoterpenes account for the bulk of the active components, accounting for 74.65–96.23 percent, with sesquiterpenes contributing about 0.75–16.32%. The most common monoterpenes (10%) found in *V. negundo* essential oil throughout the six states were α -phellandrene (20.27–34.65%), sabinene (11.31%–12.21%), β -pinene (42.04%), p-cymene, and myrcene (16.78%). Regardless of origin, all essential oil samples included α -pinene, linalool, cis-sabinene hydrate, citronellal, verbenone, and bornyl acetate. Finally, climate and soil type impact the quantity and content of essential oils. These chemical markers may be used to identify *V. negundo* essential oil.

Keywords: *Vitex negundo*, essential oils, monoterpenes, chemotaxonomical variation, north-central geopolitical zone, sesquiterpenes

INTRODUCTION

Vitex negundo L. from Verbenaceae, also known as nirgundi in India and widely known as a five-leaf chase tree. The genus has over 270 species ranging from shrubs to trees in

tropical, subtropical, and temperate climates (Divya *et al.*, 2021). Traditional medicines containing vitex are used in Bangladesh, India, China, Indochina, Indonesia, Nepal, Pakistan, the Philippines, and Sri Lanka (Rani and Sharma, 2013). The leaves and seeds are extensively used topically

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