Determination of Volatile Constituents of Thai Fragrant Orchids by Gas Chromatography-Mass Spectrometry with Solid-Phase Microextraction

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ABSTRACT

Volatile constituents of four Thai fragrant orchid species, Rhynchostylis gigantea Ridl., Rhynchostylis gigantea var. harrisonianum Holtt., Vanda coerulea and Dendrobium parishii Rchb. f., were examined by Gas Chromatography-Mass Spectrometry (GC-MS). Three parts of each plant sample (the flowers, leaves and roots) were analyzed for volatile compounds using the Headspace – Solid-Phase Microextraction method (HS-SPME). Alcohols, aldehydes, alkanes, esters, ethers, ketones, monoterpenes and sesquiterpenes were identified quantitatively from the volatile compounds isolated from the flower parts. The aromatic compounds isolated differed among the orchid species. The major aromatic compounds of the flowers of R. gigantea, R. gigantea var. harrisonianum, V. coerulea and D. parishii were nerol (25.42%), 2,3-dihydrofarnesol (34.30%), nonanal (34.69%) and 2-pentadecanone (43.47%), respectively.

Keywords: Rhynchostylis gigantea, Rhynchostylis gigantea var. harrisonianum Holtt., Vanda coerulea, Dendrobium parishii, Volatile compounds, HS-SPME, GC-MS

INTRODUCTION

Many volatile compounds from plant flowers are pleasant to humans and have potential applications as components of perfumes. Thus, there is demand to characterize and synthesize new aromatic compounds to fulfill these purposes. Toward this end, many studies have identified the substances responsible for the characteristic aromas and flavors of many flowers.

Thailand is located in the tropical zone of Southeast Asia, with many endemic orchid species distributed across the country. Some important groups of orchids include: Dendrobium, Bulbophyllum, Eraia and Vanda. Because of their