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Essential oils of the rhizomes of *Alpinia conchigera* Griff. and *Alpinia latilabris* Ridl.

K. C. Wong,[1]* B. C. Lee, N. F. Lam and P. Ibrahim

[1] School of Chemical Sciences, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia
[2] School of Pharmaceutical Sciences, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia

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ABSTRACT: The essential oils obtained by hydrodistillation of the rhizomes of *Alpinia conchigera* and *Alpinia latilabris* were analysed by capillary GC and GC–MS; 50 compounds were identified in *A. conchigera* rhizome oil, among which 30 have not been detected previously. The major chemical class was terpenoids, with β-bisabolene (28.9%), 1,8-cineole (15.3%) and β-caryophyllene (10.0%) the major components. *A. latilabris* rhizomes yielded 33 identified constituents, the majority terpenoids, but the oil was clearly dominated by methyl (*E*)-cinnamate (89.5%).

KEY WORDS: *Alpinia conchigera* Griff.; *Alpinia latilabris* Ridl.; Zingiberaceae; essential oil; β-bisabolene; 1,8-cineole; β-caryophyllene; methyl (*E*)-cinnamate

Introduction

Alpinia conchigera Griff. (syn. *Languas conchigera* Burkill) and *Alpinia latilabris* Ridl. are two species belonging to the family Zingiberaceae. The first is a herb commonly found growing in damp, open spaces. It is 0.6–1.2 m tall, and is reported to produce the smallest flowers among the *Alpinia* species found in peninsular Malaysia.[1] The slender rhizomes are used to flavour food, and in native medicine for treating rheumatism, arthritis and a variety of ailments.[2] *A latilabris*, a larger herb up to 3 m tall, occurs in lowland forests. This species produces white-yellow flowers with red stripes inside the corolla, and round, edible fruits.

The chemical constituents of *A. conchigera* have been the subject of three previous studies. The first, by Yu *et al.*, reported the detection of nonacosane, β-sitosterol, 1′-acetoxychavicol acetate and 1′-acetoxyeugenol acetate in the fruit, the two phenylpropanoid derivatives showing antiinflammatory activity.[3] Later, Athamaprasangsa *et al.* identified chavicol, chavicol acetate, 1′-hydroxychavicol acetate, 4-acetoxycinnamyl alcohol and 4-acetoxycinnamyl acetate, together with six monoterpenoids, in the essential oil of the rhizomes, but no quantitative data were given.[4] These workers also found five diarylheptanoids and two flavonoids in the solvent extracts of the rhizomes. An investigation of the rhizome oil of Malaysian *A. conchigera* by Sirat and Nordin revealed the presence of 34 components, among which β-sesquiphellandrene (20.5%), β-bisabolene (12.1%) and 1,8-cineole (11.6%) were dominant.[5]

Regarding *A. latilabris*, there appears to be no published work on the essential oil constituents. There were, however, reports on the constituents of the essential oils of the rhizomes and roots,[6] as well as of the seed and fruit skin[7] of *Catimbium latilabre* (Ridl.) Holtt., a member of the Zingiberaceae considered by some to be synonymous with *A. latilabris*.[8] The essential oil of *C. latilabre* rhizomes was reported to contain terpenoids, with 1,8-cineole, linalool and carotol as the main components.

The objective of the present study was to examine the constituents of the rhizome oils of *A. conchigera* and *A. latilabris* in detail, and to compare the results obtained for *A. latilabris* with those reported for the rhizomes of *C. latilabre*.

Experimental

Material

A. conchigera rhizomes were collected in June 1997 from the Penang Botanical Garden. *A. latilabris* rhizomes were collected in December 1998 from the Tenom area, Sabah. This species was identified by Mr Anthony Lamb, Manager of Sabah Agricultural Park, Lagud Seberang, Tenom. Voucher specimens (#10100 and 10116, respectively) have been deposited in the university herbarium.

Isolation of Essential Oil

Fresh rhizomes of *A. conchigera* (220 g) and *A. latilabris* (450 g) were separately homogenized with distilled water into a slurry, which was hydrodistilled for 5 h in a

* Correspondence to: K. C. Wong, School of Chemical Sciences, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia.
E-mail: kcwong@usm.my