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α-ASARONE AND ASARONALDEHYDE IN PIPER SARMENTOSUM*

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Abstract

Examination of a non-polar fraction from the fruit of Piper sarmentosum *Roxb. (Piperaceae) revealed the presence of α-asarone and asaronaldehyde.*

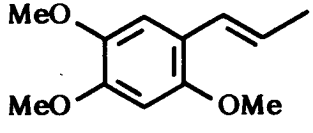
In a previous report[2] we described the isolation and structural elucidation of six components obtained from the fruit of *Piper sarmentosum*. The ubiquitous ß-sitosterol and the known unsaturated amide, pellitorine, were found along with four new natural products: an aromatic alkene, a novel pyrrole amide, and two unsaturated pyrrolidine amides which were named sarmentine and sarmentosine. Herein we report the structure determination of two components isolated from a non-polar chromatographic fraction obtained from the fruit of *P. sarmentosum*.

The less polar component, **1**, was a low-melting solid which exhibited an intense parent peak in its electron impact mass spectrum (MS EI) at m/z 208, consistent with the molecular formula $C_{12}H_{16}O_3$. The ^1H NMR spectrum indicated the presence of a 2, 4, 5-trimethoxybenzene ring with a *trans*-1-propenyl side chain ($J_{H_1\text{-}H_2}$ = 15.0 Hz). Both the ^1H and ^{13}C NMR spectra were in excellent agreement with the previously reported data[3] for (E)-1-(2, 4, 5-trimethoxyphenyl)-1-propene, **1** (α-asarone).[4]

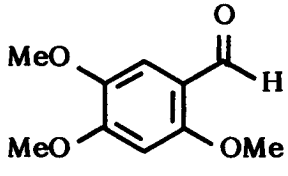
The MS EI of the second component had a parent ion (m/z 196) consistent with the molecular formula $C_{10}H_{12}O_4$. Its IR absorption bands at 1676 and 2740 cm^{-1} indicated the presence of an aromatic aldehyde. Comparison of the ^1H and ^{13}C NMR spectra of the two components revealed similarities in the aromatic ring and thus **2** was assigned the structure 2, 4, 5-trimethoxybenzaldehyde or asaronaldehyde.[5] The NMR specrtra were in excellent agreement with those reported previously for **2**.[6,7]

A number of *Piper* species are noted for their ethnomedical properties[8-10] and *P. sarmentosum* has been reported to exhibit *in vitro* activities in the reduction of blood sugar in alloxan diabetic rabbits.[10] Other medicinal uses of this and related species were mentioned in our previous report.[2]

α-Asarone, **1**, and asaronaldehyde, **2**, have not been isolated previously from any *Piper* species. The former was shown to be the hypnotic potentiating principle in the essential oil of *Acorus calamus* L.[4] and more recently has been shown to possess tranquilizing, sedative, antiulcer, spasmolytic and antisclerosis activities in various animal species.[11] Calamus root oil, which contains both **1** and **2**, has been shown to exhibit insecticidal properties.[7]



1



2

Instrumentation and Plant Material: For details see reference (2).

Isolation of **1 - 2:** The material that eluted before (E)-1-(3,4-methylenedioxyphenyl)-1-tetradecene upon chromatography of residue A (1.5 g)[2] was examined further. Rechromatography of this less polar material on silica gel with 5% acetone/benzene gave 100 mg of **1** and 20 mg of **2.**

(E)-1-(2,4,5-trimethoxyphenyl)-1-propene (α-asarone), **1.** M.p. 59-63°C [lit.[4] 62-63°C]; MS EI m/z (rel. int.) 208 (M^+, 100), 193(42), 165(18), 91(9); IR, see ref. (4); ^1H and ^{13}C NMR, see ref. (3).

2,4,5-trimethoxybenzaldehyde (asaronaldehyde), **2.** M.p. 110-114°C [lit.[5] 114°C]; MS EI m/z (rel. int.) 196 (M^+, 100), 181(53),150(19); IR and ^1H NMR, see ref. (7); ^{13}C NMR, see ref. (6).

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บทคัดย่อ

จากการตรวจสอบส่วนที่ non-polar ของสิ่งสกัดของลูกชะพลู *(Piper sarmentosum)* พบสารประกอบเพิ่มอีก 2 ชนิดคือ α -asarone และ asaronaldehyde

Supplementary material: Spectrocopic data of compounds described in this article are available upon request.