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SESQUITERPENE LACTONES AND FLAVONES FROM *STEVIA PROCUMBENS*

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In continuation of our work on the chemistry of Argentinian *Stevia* species (1, 2), we have studied *Stevia procumbens* Hieron. (Compositae, Eupatorieae). Two sesquiterpene lactones were isolated, the germacradienolide eupatoriopicrin (3) and the biogenetically related guaianolide eupahakonenin B(4). Flavonoids found were eupatorin (5,3'-dihydroxy-6,7,4'-trimethoxyflavone) and artemetin [5-hydroxy-3,6,7,3',4'-pentamethoxyflavone]. Eupahakonenin B and eupatorin have been found also in *S. satuireiaefolia* (2).

## EXPERIMENTAL

**PLANT MATERIAL.**—*S. procumbens* was collected on March 15, 1984, in Rio Vaqueros, Dept. La Caldera, Province of Salta, Argentina, and identified by A.L. Cabrera, Instituto Darwinion, San Isidor, Buenos Aires. A voucher specimen is deposited in the Museo Botánico de Córdoba.

**EXTRACTION AND ISOLATION.**—Dried aerial parts, wt. 0.60 kg, were extracted with CHCl<sub>3</sub>. The usual workup (1) afforded 21.8 g of syrupy residue. A 9-g portion was chromatographed on 220 g of Si gel packed with CHCl<sub>3</sub> and eluted with CHCl<sub>3</sub> containing increasing amounts of MeOH, 20-ml fractions being collected. Fractions 4-11 contained a mixture of two flavonoids; rechromatography of 69 mg of this material (Si gel, CHCl<sub>3</sub> and CHCl<sub>3</sub>-0.1% MeOH) yielded 5 mg of artemetin in fractions 7-11, a mixture of eupatorin and artemetin in fractions 12 and 7 mg of eupatorin from fractions 13-17. Fractions 62-71 of the original chromatogram gave 1.7 g of a mixture of two sesquiterpene lactones; fractions 72-73 afforded 0.14 g of eupatoriopicrin, mp 134-136° (C<sub>6</sub>H<sub>6</sub>). Rechromatography of the lactone mixture (70 g Si gel, CHCl<sub>3</sub> with increasing amounts of MeOH) gave 479 mg of eupahakonenin B, mp 78-79° (C<sub>6</sub>H<sub>6</sub>) and 20 mg of eupatoriopicrin. Eupatorin, eupatoriopicrin, and eupahakonenin B were identified by comparison (tlc, nmr, mp) with authentic samples. Artemetin was characterized by its mass spectral fragmentation (5) and identified by comparison (tlc, nmr and nmr of its acetate) with authentic samples of artemetin and artemetin acetate.

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A MAJOR ALKALOID OF THE LEAVES AND STEMS OF  
*STEPHANIA ROTUNDA*<sup>1</sup>

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*Stephania rotunda* Loureiro (Menispermaceae) is a climber indigenous to India and Indochina, where it has been used as a folk medicine for the treatment of pulmonary consumption, dysentery, fever, abdominal ills (tubers), asthma (tubers and stems), ascariasis, dysmenorrhea (stems), indigestion, wounds, head-ache, sore-breasts (leaves), and leprosy (flowers) (1-5). We have previously reported the isolation of four isoquinoline alkaloids from the tubers (6, 7) with (-)-tetrahydropalmatine as the major alkaloid. In this report, we describe the isolation and identification of the hasubanan alkaloid, cepharamine, from the leaves and stems of the title plant. This major alkaloid was identified on the basis of the spectral data and by direct comparison with an authentic sample (8). (-)-Tetrahydropalmatine was not detected in the leaves and stems. The alkaloidal content of the aerial plant parts was found to be quite different from that of the tubers.

EXPERIMENTAL

**PLANT MATERIAL.**—The material was from cultivated plants transplanted from Nepal to Japan. The plant was identified by Dr. S. Kitamura, Professor Emeritus, Kyoto University. Voucher specimens have been deposited in the herbarium of Kyoto Pharmaceutical University.

**EXTRACTION AND ISOLATION.**—Air-dried and cut materials (leaves: 1.735 kg; stems: 1.2 kg) were extracted separately with hot MeOH. The extracts were subjected to an isolation procedure based on the Stas-Otto method (9, 10). The resulting phenolic alkaloid fraction (leaves: 3.346 g; stems: 0.248 g) was treated individually with hydrobromic acid to give cepharamine hydrobromide (leaves: 1.78 g; stems: 0.243 g). The free base was identified as cepharamine by mmp, uv, ir, <sup>1</sup>H-nmr, [α]<sub>D</sub>, and tlc comparisons with a reference sample. The alkaloidal constituents (phenolic and nonphenolic) from the leaves and from the stems were examined separately by tlc and showed no difference. However, their chromatograms were qualitatively different from those of tubers. The nonphenolic alkaloid fractions from the leaves and from the stems showed eight spots on tlc, but none of them corresponded to tetrahydropalmatine.

Full details of the isolation and identification procedures are available on request to the senior author.

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<sup>1</sup>Part 283 in the series "Studies on the alkaloids of Menispermaceae plants." For part 282, see: M. Matsui, Y. Yamamura, T. Takebayashi, K. Iwaki, Y. Takami, K. Kunitake, F. Koga, S. Urasaki, and Y. Watanabe, *J. Nat. Prod.*, **47**, 858 (1984).