7. R.L. Hoyle, "Los Mochicas," Casa Editora La Cronica y Variedades, Lima, 1938.
8. Y. Tsuchiya, M. Shimizu, Y. Hiyama, K. Itoh, Y. Hashimoto, M. Nakayama, T. Horie, and N. Morita, *Chem. Pharm. Bull.*, **33**, 3881 (1985).
9. F.A.T. Barberan, L. Hernandez, F. Ferreres, and F. Tomas, *Planta Med.*, **40**, 452 (1985).
10. B. Voirin, M.R. Viricel, J. Favre-Bonvin, C.O. Van Den Broucke, and J. Lemi, *Planta Med.*, **40**, 523 (1985).

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FLAVONOIDS FROM *AGERATINA SALTILLENSIS*

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In a continuation of our chemotaxonomic studies in the tribe Eupatorieae (Compositae) (1-5), we investigated the flavonoids of *Ageratina saltillensis* (B.L. Robinson) R.M. King & H. Robinson. Thirteen 6-methoxylated and non-6-methoxylated flavonol derivatives have been isolated, namely: 6-methoxykaempferol and its 3-*O*-glucoside and 3-*O*-rhamnoside, 7-methyl ether and 7-methyl ether 3-*O*-rhamnoside; quercetin and its 3-methyl ether and 3-*O*-glucoside; 6-methoxyquercetin and its 3-methyl ether, 3,4′-dimethyl ether, 3-*O*-glucoside and 7-methyl ether 3-*O*-rhamnoside. The earlier studies of the genus *Ageratina* have shown that the 6-methoxylation, 7-methoxylation, and 6,7-dimethoxylation are characteristic of the main evolutionary line in the genus *Ageratina* (1-7). In our present study, we found that *A. saltillensis* contains mainly flavonoids with 6-methoxylation and 6,7-dimethoxylation (see Experimental section), which provides support for its alignment with the other species placed in *Ageratina* (1-7).

EXPERIMENTAL

PLANT MATERIAL.—Aerial parts of *A. saltillensis* (1400 g) were collected 9.2 mi northeast of San Antonia Tena Nevada on the road to Zaragosa, Nuevo Leon Mexico, on October 7, 1984. Voucher material (Ayers No. 489) is deposited in the Plant Resources Center of the University of Texas at Austin.

EXTRACTION, ISOLATION, AND IDENTIFICATION.—Ground, dried leaves and flowers of *A. saltillensis* were extracted sequentially with 90% MeOH and 50% MeOH. After filtration the extracts were combined and concentrated to an aqueous layer under reduced pressure, and the concentrate was partitioned against CH_2Cl_2 and EtOAc. The concentrate from the CH_2Cl_2 and the EtOAc extracts were chromatographed over Polyclar AT (GAF Corp.) columns packed initially in toluene; during elution the solvent was gradually altered in 10% increments to 100% MeOH and finally concluded with Me_2CO-MeOH (1:1). Fractions, which were collected by monitoring the column with uv light, were further separated by paper chromatography using 15% HOAc on Whatman 3MM paper. The EtOAc fraction yielded all the compounds [6-methoxykaempferol (10 mg) and its 3-*O*-glucoside (42 mg) and 3-*O*-rhamnoside (16 mg), quercetin (18 mg) and its 3-*O*-glucoside (21 mg), 6-methoxyquercetin (30 mg) and its 3-*O*-glucoside (2,565 mg) and 7-methyl ether 3-*O*-rhamnoside (568 mg) except for 6-methoxykaempferol 7-methyl ether (74 mg), quercetin 3-methyl ether (8 mg), and 6-methoxyquercetin 3,4′-dimethyl ether (26 mg) which were isolated from the CH_2Cl_2 extract and 6-methoxykaempferol 7-methyl ether 3-*O*-rhamnoside (3,884 mg) and 6-methoxyquercetin 3-methyl ether (15 mg) which were detected in both the CH_2Cl_2 and EtOAc fractions.

All compounds were purified over Sephadex LH-20 in 80% or 100% MeOH prior to analysis by uv, ^{1}H nmr (as TMSi ethers), color reactions on paper under uv light (8), and comparisons with authentic samples.

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LITERATURE CITED

1. S. Yu, D.A. Gage, N. Fang, and T.J. Mabry, *J. Nat. Prod.*, **49**, 181 (1986).
2. S. Yu, J. Norris, N. Fang, and T.J. Mabry, *J. Nat. Prod.*, **49**, 553 (1986).
3. S. Yu, N. Fang, and T.J. Mabry, *Rev. Latinoamer. Quim.*, (in press).
4. N. Fang, S. Yu, and T.J. Mabry, *Phytochemistry*, **25**, 2665 (1986).
5. N. Fang and T.J. Mabry, *J. Nat. Prod.*, **49**, 737 (1986).
6. L. Quijano, F. Malanco, and T. Rios, *Tetrahedron*, **26**, 2851 (1970).
7. F. Bohlmann and M. Grenz, *Chem. Ber.*, **110**, 1321 (1977).
8. T.J. Mabry, K.R. Markham,and M.B. Thomas, "The Systematic Identification of Flavonoids," Springer-Verlag, New York, 1970.

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FLEMISTRICTIN-B: A CHALCONE FROM THE SEEDS OF *LONCHOCARPUS SERICEUS*

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Lonchocarpus sericeus (Poir.) H.B. & K. (Leguminosae, Papilionoideae) is a small forest tree found in both West Africa and the neotropics (1). In a previous investigation of seeds of Ghanaian origin the chalcones lonchocarpin, derricin, derricidin (cordoin), isocordoin, and 4-hydroxylonchocarpin, and the flavanone isolonchocarpin were reported (2). An examination of the roots of material of South American origin yielded all of the above with the exception of the last two named chalcones (3).

A re-examination of seeds from this species yielded four chalcones, three of which were characterized as the previously recorded lonchocarpin, derricin, and isocordoin and the fourth as the dihydrofuranochalcone, flemistrictin-B, which had not previously been reported from *Lonchocarpus* but only from another papilionaceous taxon, *Flemingia stricta* (4). The ^{13}C-nmr spectrum of flemistrictin-B is reported for the first time.

EXPERIMENTAL

PLANT MATERIAL.—*L. sericeus* seeds were collected in Ghana. A voucher specimen has been lodged in the Carpological Collection of the Herbarium of the Royal Botanic Gardens, Kew.

EXTRACTION AND ISOLATION.—Ground seeds (31 g) were extracted successively with petroleum ether (60-80°), $CHCl_3$, and MeOH. Fats were removed by column chromatography over Si gel, eluting with petroleum ether. Elution of the column with petroleum ether-EtOAc (19:1) gave a mixture that was subsequently separated by centrifugal preparative tlc (Si gel; toluene) to yield lonchocarpin (42 mg) and derricin (6 mg). Further elution of the column with petroleum ether containing increasing amounts of EtOAc gave, with 10% EtOAc, derricin (8 mg), with 20% EtOAc, isocordoin (42 mg), and with 25% EtOAc, flemistrictin-B (18 mg).

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