ALKALOIDS FROM *FUMARIA CAPREOLATA* AND *FUMARIA BELLA*

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Continuing our studies (1-3) on the components of *Fumaria* species, we describe here the isolation and identification of the alkaloids of *Fumaria capreolata* L. and *Fumaria bella* P.D. Sell, (Fumariaceae).

Compound	*F. capreolata*		*F. bella*	
	% of crude bases	Ref.	% of crude bases	Ref.
(+) Isoboldine	4		3	
Sanguinarine	2	(7)	< 1	
(+) Bicuculline	2		< 1	
Coptisine		(8)		
Protopine	45	(8,9)	50	
(+) Fumariline	4			
(+) Parfumine	12		16	
(−) Cheilanthifoline	5		5	
(−) Scoulerine	4		6	
(−) Stylopine	6		8	
(+) Adlumine			1	
(+) Parfumidine			1	

EXPERIMENTAL

GENERAL EXPERIMENTAL PROCEDURES.—Spectra were recorded with the following instruments: uv, Beckman 25; ir, Perkin-Elmer 237; mp, Köfler hot-stage and microscope; pmr, Bruker WP 80 MHz; ms, VG Micromass 70. Adsorbants for tlc and cc were from E. Merck. Solvent systems utilized were $CHCl_3$-MeOH (80:20), (90:10), (95:5), (98:2). Spots were detected by exposure to I_2 or by spraying with 10% H_2SO_4 followed by heating.

PLANT MATERIALS.—The aerial parts of *F. capreolata* (4), subsp. *badingtonii* (Pugsley) P.D. Sell (5), (*F. capreolata* var. *badingtonii* Pugsley), grown from seeds given by J.P. Boivin (Museum National d'Histoire Naturelle, Paris, France) were collected by the authors from Alfortville (94140) during May 1982, when the plant began flowering.

F. bella (6), (*F. major badaro*, non Roth., *F. agraria* sensu Coste, non Lag.), was collected from Montpellier (34000) by Professor Susplugas, Faculté of Pharmacie Montpellier during April 1982.

EXTRACTION AND ISOLATION OF ALKALOIDS.—Dried aerial parts (twigs and leaves) of *F. capreolata* (1.2 kg) and of *F. bella* (1 kg) were worked up by standard procedures (1-3). The crude alkaloid mixture (0.45% in *F. capreolata* and 0.67% in *F. bella*) was subjected to flash chromatography over Si gel. Fractionation of *F. capreolata* yielded nine alkaloids. For *F. bella*, this is the first report of the isolation of ten alkaloids. The structures were deduced from mp, ^1H nmr, ms, uv, ir, $[\alpha]_D$, and elemental analyses, and were identified by authentic sample comparison by hplc and SiO_2-tlc.

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

ACKNOWLEDGMENTS

Thanks are due to Mr. J.P. Boivin for providing seeds of *F. capreolata* and also to Professor P. Susplugas for collection and identification of *F. bella*. We are grateful to Mr. C. Thal, CNRS, Gif-sur-Yvette, France, for ^{13}C-nmr spectra.

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Received 10 July 1985

IRIDOID GLUCOSIDES FROM *BARLERIA LUPULINA*

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Barleria lupulina Lindl. (Acanthaceae) (1), locally known as "Slaed Pang Pawn," is a shrub widely used in folk medicine as an anti-inflammation agent and for relieving pain from insect bites (2). It has also been claimed as a remedy for snake bites (3). Investigations on the ethanolic extracts of the aerial parts of *B. lupulina* resulted in the isolation of three iridoid glucosides: shanzhiside methyl ester (4), barlerin, and acetyl barlerin (5).

EXPERIMENTAL

PLANT MATERIAL.—The plant material was collected in Bangkok and was identified by Associate Professor Payow Maunwongyathi, Faculty of Pharmacy, Mahidol University, Bangkok. A voucher specimen (BKF No. 82474) has been lodged at the Forest Herbarium, Royal Forest Department, Ministry of Agriculture and Cooperatives, Bangkok.

EXTRACTION AND ISOLATION.—The fresh aerial parts of *B. lupulina* (950 g) were extracted with 95% EtOH (5 liters). The concentrated aqueous ethanolic extract (300 ml) was washed twice with hexane (2×150 ml); the lower phase evaporated in vacuo and chromatographed on a silica gel column using CH_2Cl_2/MeOH, with a gradually increasing concentration of MeOH. The CH_2Cl_2-MeOH (90:10) fractions gave a mixture of acetyl barlerin and barlerin, together with colored materials. The CH_2Cl_2-MeOH (80:20) fractions gave shanzhiside methyl ester and a minor quantity of barlerin.

Column chromatography of the less polar fractions, followed by repeated short column chromatography, gave acetyl barlerin (721 mg) and barlerin (505 mg). Shanzhiside methyl ester was obtained (450 mg) by similar treatments of the more polar fractions. Physical (mp of the acetates) and spectroscopic (uv, ir, ^1H and ^{13}C nmr) comparisons with the reported data (4,5) revealed the identities of these iridoids.

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

ACKNOWLEDGMENTS

The author is grateful to Ramkhamhaeng University for financial support of this work and to Dr. Lindsay T. Byrne, University of Western Australia, for ^1H-nmr and ^{13}C-nmr spectra. This work was supported in part by the Network for the Chemistry of Biologically Important Natural Products.

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Received 19 July 1985