

THE ALKALOIDS OF FUMARIA MURALIS

A. Loukis, R.D. Waigh, Department of Pharmacy, Manchester University, Manchester M13 9PL.

The genus Fumaria belongs to the family Papaveraceae, and those members of the genus which have been investigated have been shown to produce isoquinoline alkaloids (Santavy 1979). Fumarias have been used medicinally in the past (hence the name F. officinalis for Common Fumitory) although there seems to be little modern support or evidence for a place in Western medicine. Despite this, F. officinalis and possibly other species are used widely in Eastern Europe, and deserve the more thorough phytochemical investigations which are now being undertaken. Previous work has shown the genus to be capable of elaborating most of the alkaloid types produced by the Papaveraceae, with the exception of the morphine group.

Fumaria muralis ssp. boraei (Jord) Pugsl. (F. borae Jord) is the commonest species in the Manchester district, but had never been examined phytochemically. The plant material was collected in September, and authenticated at the Manchester University herbarium, where a specimen has been deposited. It is a strong growing scrambling plant, reaching a height of six feet on a suitable support such as a fence.

Fresh material was extracted, and work was confined to the leaves after initial t.l.c. data showed the stems to produce similar alkaloids but in smaller quantities. The leaves (184g) were successively extracted with petrol, chloroform and methanol, and each extract, after evaporation, subjected to column chromatography followed by preparative t.l.c. After separation the alkaloids were identified by comparison of u.v., n.m.r. and mass spectral data with literature values. Good quality n.m.r. data were obtained on as little as 1mg of sample in some instances by use of Fourier transform spectrometers (Bruker W.P. 80 or Varian SC 300), without which identification would have been tenuous.

The petrol extract produced fumariline, capnoidine (adlumidine) and parfumine, the chloroform extract fumarophycine, fumaritine, bicuculline and an unidentified compound which resembled eugenol in its n.m.r. spectrum, but not on t.l.c. or m.s., together with further amounts of fumariline and parfumine. The methanol extract produced three compounds which did not correspond to any known alkaloids. One of these may be the previously unreported N-methylfumaritine, the other two remain unidentified.

The alkaloids which have been isolated and identified all possess typical Fumaria spirobenzylisoquinoline (Preisner and Shamma 1980) or phthalideisoquinoline structures. The apparent absence of other structural types is curious, since the protopine group, for example, are often the major alkaloids in Fumaria spp. Whether this is a reflection of our use of fresh rather than dried material remains to be seen.

A. Loukis was on study leave from the University of Athens.

We thank Dr. J.W. Franks and Dr. S.R. Edwards for identification of plant material.

Preisner, M.R., Shamma, M. (1980) J. Nat. Prod. 43: 305-318.

Santavy, F. (1979) in: Manske, R.H.F., Rodrigo, R.G.A. (eds) The Alkaloids, Academic Press, New York, XVII: 385-544.