

MINOR ALKALOIDS FROM *THALICTRUM MINUS*

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The alkaloids hitherto found in *Thalictrum minus* L. ssp. *majus* (known also as *Thalictrum minus* ssp. *elatum* in some earlier papers) belong mainly to the aporphine-benzylisoquinoline group (1-5). Here we report the isolation of two known alkaloids, namely, thalictuberine (6,7) and thaliadine (8), as minor alkaloids from the roots of *T. minus* ssp. *majus*.

EXPERIMENTAL

GENERAL EXPERIMENTAL PROCEDURES.—Spectra were recorded with the following instruments: uv, Specord uv-vis; nmr, Brüker WM-250; ms, JMS D-300; ir, Unicam SP-200 G; and cd, Dichrographe Mark III "Jovin Ivon."

PLANT MATERIAL.—The roots of *T. minus* L. ssp. *majus* were collected in September 1982, near Sli-ven, Bulgaria. The voucher specimen No. 1169 is deposited in the herbarium of the Institute of Botany, Bulgarian Academy of Science (Sofia).

EXTRACTION AND ISOLATION OF THE ALKALOIDS.—Air-dried roots of the plant (2.2 kg) worked up by standard procedures, yielded 6.2 g of a crude alkaloid mixture, which was then chromatographed on a column of neutral alumina (activity II) (300 g) using Et₂O followed by Et₂O-MeOH, with a gradually increasing concentration of MeOH. The Et₂O fractions afforded a mixture of thalmelatidine and thaliadine. The Et₂O-MeOH (97:3) fractions gave a mixture of O-desmethyl adiantifoline and thalictuberine.

Thaliadine (5 mg) was obtained in a pure form after short column chromatography (silica gel G Merck—type 60 for tlc) by Hunt and Rigby's method (9). Elution was with CHCl₃ gradually enriched with MeOH. The same procedure was used for the purification of thalictuberine (19 mg). Thaliadine was identified by nmr, uv, ir, ms, and cd. It was compared with synthetic thaliadine, prepared from adiantifoline by short-time oxidation with KMnO₄ (8). Thalictuberine was identified by nmr, uv, ir, ms, co-tlc, and mmp with an authentic sample.

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

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