ALKALOIDS OF *PAPAVER LACERUM*

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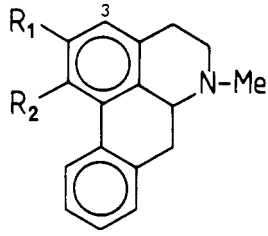
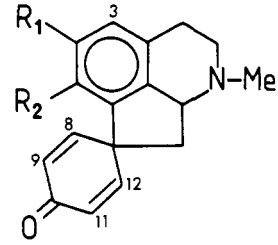
There are no previous reports on the chemical constituents of *Papaver lacerum* Popov. (syn. *P. laevigatum* auct. non Bieb.), a species which is native to Turkey and Soviet Armenia (1). This communication reports the presence of four alkaloids extracted from the stems and capsules of a Turkish sample of *P. lacerum* collected in Anatolia. The major alkaloid was the aporphine, roemerine (**1**), while another aporphine, *N*-methyl asimilobine (**2**), and the proaporphines mecambrine (**3**) and pronuciferine (**4**)





1 $R_1-R_2 = OCH_2O$

2 $R_1 = OH$; $R_2 = OMe$

3 $R_1-R_2 = OCH_2O$

4 $R_1 = R_2 = OMe$

were obtained as minor alkaloids. The alkaloids were identified by their ultra-violet, mass and proton magnetic resonance spectra and by chromatographic comparison with reference compounds. The proton magnetic resonance spectrum of the isolated *N*-methyl asimilobine (**2**) clearly differentiated it from the corresponding 1-hydroxy-, 2-methoxy-analogue, lirinidine (2). The alkaloids, roemerine, mecambrine and pronuciferine, have been isolated from a number of *Papaver* species (2–5); *N*-methyl asimilobine does not appear to be a common alkaloid, although it has been reported recently to be the major alkaloid of an Egyptian sample of *P. rhoeas* (6).

P. lacerum is in the section Papaver (≡Orthorhoeades Fedde) which includes *P. rhoeas*, *P. commutatum*, *P. postii*, *P. dubium*, *P. arenarium*, *P. stylatum* and *P. clavatum*. Morphologically, *P. lacerum* is similar to *P. dubium* L. (syn. *P. laevigatum* Bieb.), which is a widespread, variable species found in Europe and in Asia. Mecambrine and roemerine have been reported from *P. dubium*, together with the rhoeadine-type alkaloids, rhoeadine, isorhoeadine, rhoeagenine, several papaverrubines, berberine, coptisine, protopine and sanguinarine (7–11). In view of the variable alkaloid constituents reported from several species of the section Papaver, the possibility of chemical races of

P. lacerum cannot be ignored. Hence it would be of interest to investigate further samples of *P. lacerum* from other parts of Turkey and Soviet Armenia for the presence of alkaloids.

EXPERIMENTAL

PLANT MATERIAL.—The plant material was collected at Kayser, Turkey, by G. Sariyar and A. Baytop, June 21, 1977. Identification as *P. lacerum* Popov. was determined by Professor A. Baytop, and a reference sample is retained in the herbarium of the Faculty of Pharmacy, University of Istanbul.

ISOLATION OF ALKALOIDS.—Dried capsules and stems (130 g) were macerated (3 x) with methanol, and the combined filtered extracts were concentrated to dryness under reduced pressure. The residue was extracted with 3% acetic acid (5 x 25 ml); the combined acid extracts were washed with light petroleum, made alkaline with 25% ammonium hydroxide solution, and extracted with diethylether (3 x 40 ml). The combined ethereal extracts, when washed, dried and concentrated to dryness under reduced pressure, yielded 207 mg of total crude alkaloid (0.16%). Preparative tlc with absorbent Silica gel G (Merck) and the solvent system, benzene-acetone-ammonium hydroxide (90:10:1), yielded amorphous roemerine (105 mg) and a pale brown solid (46 mg). After further preparative tlc with alumina G (Merck) and the solvent system benzene-acetone-methanol (7:2:1), the solid yielded the amorphous alkaloids mecambrine (19 mg), pronuciferine (5 mg), and *N*-methyl asimilobine (1 mg).

IDENTIFICATION OF ALKALOIDS.—Roemerine (**1**) exhibited uv, ms (12), and ^{1}H nmr spectra (13) identical with those reported in the literature and R_f values on tlc identical with those of the reference alkaloid. Mecambrine (**3**) exhibited uv (14) and ms (15) spectra identical with those reported in the literature. ^{1}H nmr, 60 MHz ($CDCl_3$) δ 6.92 (2H, *m*, $J_{8,12}$ 2Hz, $J_{8,9}$ 8 Hz; C-8H, C-12H), 6.32 (2H, *m*, $J_{9,11}$ 1 Hz, $J_{8,9}$ 8 Hz; C-9H, C-11H), 6.53 (1H, *s*; C-3H), 5.83 (2H, q; *ar* OCH_2O), 2.37 (3H, *s*; NMe); tlc R_f values identical with those of the reference sample.

Pronuciferine (**4**) exhibited uv (14), ms (16) and ^{1}H nmr spectra identical with those reported in the literature and tlc R_f values identical with those of the reference sample.

N-methylasimilobine (**2**) exhibited uv, ms, and ^{1}H nmr spectra identical with the literature values (6) and tlc R_f values identical with those of the reference sample.

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