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ALKALOIDS OF *PAPAVERACEAE* (XVI) [1]. ALKALOIDS OF *PAPAVER FUGAX* POPULATION TAROM

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Abstract

Papaver fugax Poiret population Tarom was shown to contain one major alkaloid, mecamberine (0.4%), and six minor alkaloids, roemerine, pronuciferine, protopine, thebaine, nornuciferine and salutaridine. Nornuciferine was detected for the first time in *P. fugax*

Introduction

In a continuation of phytochemical studies of Iranian wild species of the Papaveraceae family [3], the alkaloids of *Papaver fugax* Poiret population Tarom [4] were studied. *Papaver fugax* Poiret is a biennial plant scattered over a large area of Tarom in the north-west of Iran at an altitude of about 1700 m. The height of the plant is 20-60 cm. The plant blooms from the end of May to late June.

Results and Discussion

The following alkaloids were isolated from *Papaver fugax* Poiret population Tarom, through column chromatography and preparative TLC (Table 1, Fig. 1).

The m.p. and spectral data of the above alkaloids were similar to those already reported [5-10]. Nornuciferine was detected for the first time in *P. fugax* Poiret population Tarom.

Experimental Section

Melting points were taken on a Kofler hot stage apparatus and are uncorrected. The UV spectra were obtained using a Shimadzu UV-160-A. The IR spectra were obtained using a Perkin-Elmer Model 781 or Nicolet FT-IR 550 spectrographs (potassium bromide disks). The ^1H NMR spectra were recorded on a Bruker FT-80 or a Varian Unity 400 plus spectrometer and chemical shifts (δ) are in ppm relative to internal tetramethylsilane. The mass spectra were run on a Varian Model MAT-311 or Finigan TSQ-70 spectrometer at 70 eV.

Plant Material

The aerial parts of *Papaver fugax* Poiret population Tarom collected in July 1992 were air dried in the shade and then at 60° to a constant weight and powdered so that all the material could be passed through a mesh not larger than 0.5 mm.

Extraction Procedure

Starting from 1000 g powdered plant material, the alkaloids were extracted as reported [5] to give 11 g (1.1%) of a crude mixture of alkaloids.

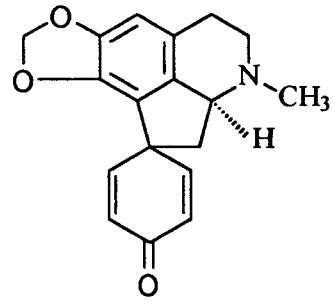
Column Chromatography

The crude extract (11 g) was dissolved in chloroform (30 ml) and placed on a chromatographic column (4.5 cm) with silica gel (mesh 230-400, 400 g) as the adsorbent. The column was eluted as reported [5].

Preparative TLC

Similar fractions obtained from chromatography were combined, and the solvent was removed under reduced pressure. The components of the residue were separated by preparative TLC using silica gel and one of the solvent systems reported in Table 1.

Keywords: *Papaver fugax*; *Papaveraceae*



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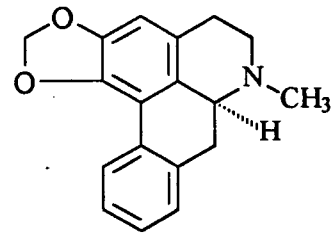

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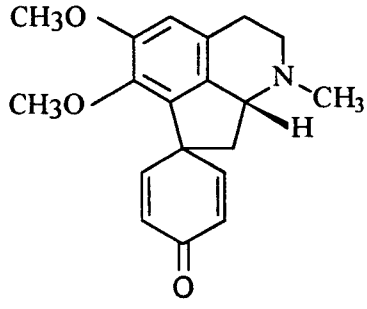

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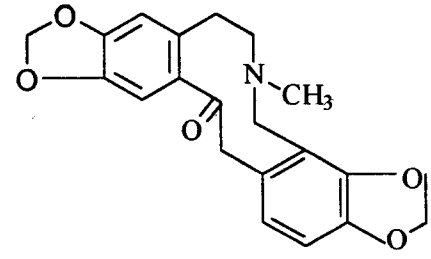

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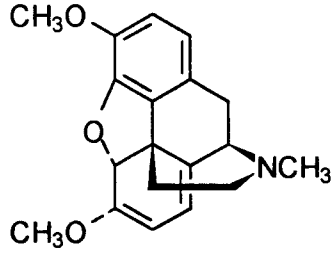

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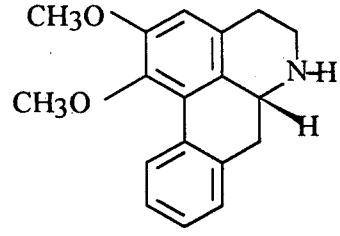

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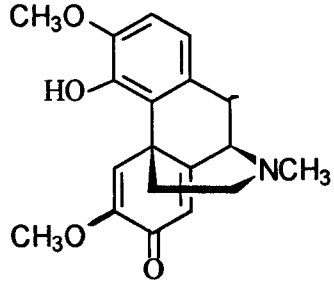

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Figure 1

Table 1. Chromatography results of *P. fugax* Poiret

Alkaloids	Solvent for column elution (%)	TLC (R_f value)[c]		
		A	B	C
Mecamberine (1)	0.[a]	0.52	0.41	0.32
Roemerine (2)	30[a]	0.67	0.6	-
Pronuciferine (3)	50[a]	0.48	0.39	-
Protopine (4)	60[a]	0.71	0.54	-
Thebaine (5)	100[a]	0.49	0.51	-
Nornuciferine (6)	5.[b]	0.45	0.27	-
Salutaridine (7)	10[b]	0.35	0.14	-

[a] Chloroform-petroleum ether

[b] Methanol-chloroform

[c] Solvent system for TLC: A, ethyl acetate-methanol-ammonia (85:10:5); B, petroleum ether-chloroform-diethylamine (70:20:10); C, petroleum ether-chloroform-triethylamine (60:30:10)

Mecamberine (1)

Combined fractions which were eluted with 100% petroleum ether had mainly one alkaloid which was purified by TLC on silica gel using solvent system C (R_f 0.32). The compound was crystallized from acetone to give mecamberine: m.p. 196-198° [lit. [5], m.p. 196-198°], and mixed melting point with an authentic sample 196-198°.

Roemerine (2)

This alkaloid was eluted with 30% chloroform-petroleum ether and was crystallized from ethanol: m.p. 100-103° [lit. [5], m.p. 100-102°], and mixed melting point with an authentic sample 100-103°.

Pronuciferine (3)

Combined fractions which were eluted with 50% chloroform-petroleum ether contained mainly pronuciferine which was further purified by preparative TLC on silica gel using solvent system A (R_f 0.48), m.p. 127-129° (ethanol) [lit. [6], m.p. (127-129°)]; IR (KBr) ν 1665 (C=0), 1620, 1490 and 1050 cm^{-1}; ^1H NMR ($CDCl_3$): 6.8-7.2 (2q, 2H, β, β' olefinic protons, $J_{\beta,\beta'}$= 2.5 Hz $J_{\alpha,\beta}$= $J_{\alpha'\beta'}$=10 Hz), 6.30 (s, 1H, H_4), 6.2-6.5 (2q, 2H, α, α' olefinic protons $J_{\alpha,\alpha'}$= 1.5 Hz, $J_{\alpha,\beta'}$,= Jα', $_\beta$'=10 Hz), 3.8 (s, 3H, OCH_3), 3.6 (s, 3H, OCH_3) and 2.41 ppm (s, 3H, NCH_3); ms: m/z (%) 311 (M^+, 100), 310 (46), 282 (75), 268 (51), 253 (18), 225 (25), 167 (21), 165 (29), 149 (42), 111 (22), 85 (36), 71 (55) and 57 (77). The m.p. and spectral data of this alkaloid were similar to those already reported [6, 7, 8].

Protopine (4)

This alkaloid was eluted with 60% chloroform-petroleum ether, crystallized from ethanol m.p. 207-208° [lit. [9], m.p. 205-207°], and mixed melting point with an authentic sample 207-208°.

Thebaine (5)

Elution of the chromatography column with chloroform when monitored by TLC indicated one component which was crystallized from ethanol to give thebaine: m.p. 190-193° [lit. [10], m.p. 193°], and mixed melting point with an authentic sample 190-193°.

Nornuciferine (6)

This alkaloid was eluted with 5% methanol-chloroform crystallized from ethanol, m.p. 128-129° [lit. [5], m.p. 127-128°], and mixed melting point with an authentic sample 128-129°.

Salutaridine (7)

This alkaloid was eluted with 10% methanol-chloroform, crystallized from ethyl acetate to give salutaridine: m.p. 197-198° [lit. [5], m.p. 197-199°], and mixed melting point with an authentic sample 197-198°.

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2. This work was a part of N. Samadi's dissertation for the degree

of pharmacy Doctorate.

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