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ALKALOIDS OF *GLAUCIUM GRANDIFLORUM*

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Glaucium grandiflorum Boiss. and Huet (Papaveraceae) is a perennial herb indigenous to various regions of the Mideast extending from the eastern Mediterranean to Iran (1-3). Although numerous alkaloids with varying pharmacological activities have been isolated from approximately ten or so species of the genus *Glaucium*, there have been no reports of the presence of alkaloids or of their chemotaxonomic profile in the plant *G. grandiflorum* (4,5). An investigation of the alkaloid-containing fractions of an extract of the whole plant of *G. grandiflorum*, via column chromatography, led to the isolation of (–)-norchelidonine, dihydrochelerythrine, (–)-8-acetyldihydrochelerythrine, protopine, allocryptopine, (±)-tetrahydrojatrorrhizine (corypalmine), and (±)-tetrahydropalmatine.

EXPERIMENTAL

PLANT MATERIAL.—The plant material used in this study was collected and identified by Dr. Dawud Al-Eisawi in April 1984, from the Irbid District, Yarmuk University, new permanent campus. Voucher specimens are on deposit at the Department of Pharmacognosy, Faculty of Pharmacy, University of Jordan, Amman, Jordan and at the Herbarium, Faculty of Science, Amman.

EXTRACTION AND ISOLATION.—Powdered, dried, whole plant (1.2 kg) was extracted by percolation with EtOH (10 liters). The extract was concentrated to a residue, stirred with aqueous citric acid and filtered, and the filtrate was extracted with Et₂O. The remaining aqueous solution was basified with NH₄OH and extracted with Et₂O, and the nonphenolic alkaloids (Fraction A) were separated from the phenolic alkaloids (Fraction B) in the usual manner (6). Chromatography of Fraction A over Si gel afforded (–)-norchelidonine (11 mg) (7,8), dihydrochelerythrine (3 mg) (7), (–)-8-acetyldihydrochelerythrine (5 mg) (7,9), protopine (16 mg) (10), and allocryptopine (18 mg) (10). Chromatography of Fraction B over Si gel yielded (±)-tetrahydrojatrorrhizine (corypalmine) (4 mg) (11) and (±)-tetrahydropalmatine (5 mg) (11). The alkaloids were identified by direct comparison with authentic samples or comparison with literature data using accepted techniques (uv, ir, eims, mp, [α]_D) (7-11).

Full details of the isolation and identification of the alkaloids are available from the senior authors upon request.

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CARYOCAR MICROCARPUM: AN ANT REPELLENT AND FISH POISON
OF THE NORTHWEST AMAZON

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The genus *Caryocar*, one of two genera in the small, tropical, New World family Caryocaraceae, has had little chemical investigation beyond characterization of its seed oils which furnish edible fats of potential commercial value. The ethnobotany of the family has been reviewed (1). Our interest in *Caryocar microcarpum* Ducke arose through an observation by one of us (RFR) that its leaves were repellent, if not toxic, to leaf-cutting ants known to cause extensive damage to tropical crops and from its use by tribes of Tukanoan and Kubeo Indians of the northwest Amazon as a fish poison. A related species, *Caryocar brasiliense*, was found by De Oliveira and co-workers to have some activity against Sarcoma 180 in animals by reason of its content of oleanolic acid (2).

The leaves of *C. microcarpum* were found to contain large quantities of gallitannin along with ellagic acid, gallic acid, and methyl gallate as well as glycosides of oleanolic acid and its hydroxylated derivatives, 2 β -hydroxyoleanolic acid, hederagenin, and bayogenin.

Saponins are known to be ichthyotoxic; tannins and saponins are known to be repellent to herbivores (3). Hydroxyoleanolic acid derivatives have been found repellent to termites (4), and related friedooleanan-12-ene-27-oic acids are repellent to the leaf-cutting ant *Atta cephalotes* (5,6). Our findings are thus consonant with the observation of antitoxic activity and with the widespread use of *C. microcarpum* as a fish poison among the Indian peoples of the northwest Amazon. Examination of the light petroleum ether extracts of the leaves is in progress and will be reported at a later date.

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