

N-METHYLTYRAMINE AND HORDENINE FROM *MAMMILLARIA MICROCARPA**

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Key Word Index—*Mammillaria microcarpa*; Cactaceae; cactus alkaloids: *N*-methyltyramine; hordenine.

Plant. Whole plants of *Mammillaria microcarpa* Eng. **Source.** Obtained through Dr. Jack R. Cole, College of Pharmacy, University of Arizona, for the National Cancer Institute; collected at Agua Caliente Canyon, Santa Rita Mountains, elevation ca 1200 m, Santa Cruz County, Arizona, March 6, 1968; assigned NSC No. B-628694; originally identified as *M. sheldonii* Boed. **Previous work.** Unidentified alkaloids reported in *M. magnimamma* (Haw.) Br. and R. [1] and *M. meiacantha* (Engel.) Br. and R. [2]; *N*-methyl-3,4-dimethoxy- β -phenethylamine from *M. heyderi* Muehl. [3]; tyramine, *N*-methyltyramine, hordenine, synephrine, and β -O-methylsynephrine from *M. elongata* DC. [4]; acetovanillone and mammillarol from *M. runyonii* Br. and R. [5]

Present work. TLC screening [6] detected alkaloids. Defatting and CHCl_3 extraction of 380 g (dry wt) of pulverized plant material yielded alkaloids in fractions A and C [7]. Following anion exchange chromatography of the combined A and C fractions, five PLC plates (1 mm, Si gel PF₂₅₄) were used to resolve the phenolic components. The plates were developed $\times 3$ in $\text{EtOAc-MeOH-58\% NH}_4\text{OH}$ (17:2:1). Four major bands, detected under UV light and by marginal spraying, were combined with similar bands and eluted with EtOH. The hydrochlorides of the resolved alkaloids were formed by

the addition of 5% HCl (gas) in EtOH. Dropwise addition of dry Et_2O induced crystallization of two of the alkaloids: 7.5 mg of *N*-methyltyramine HCl (uncorr. mp 146.5–147.5°, mmp 147.5–149.5°, reference mp 149.5–150.5°, IR, 0.0019% yield) and 6.5 mg of hordenine HCl (uncorr. mp 177–179°, mmp 179–181°, reference mp 181–182.5°, IR, 0.0017% yield).

Biological significance. The small concentrations of these alkaloids and the apparent absence of other major alkaloids precludes the possibility of this cactus species being psychoactive due to its alkaloid content.

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* Part 32 in the series, "cactus alkaloids". For Part 31 see Mata, R., McLaughlin, J. L., and Earle, W. H. (1977) *Lloydia* **39**, (accepted for publication).

FURACRIDON, 1-HYDROXY-3-METHOXY-N-METHYLACRIDON UND ISOGRAVACRIDONCHLORIN AUS DEN WURZELN VON *RUTA GRAVEOLENS**

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Key Word Index—*Ruta graveolens*; Rutaceae; acridone alkaloids; furacridone; 1-hydroxy-3-methoxy-*N*-methylacridone; isogravacridonchlorine.

Während in den oberirdischen Teilen von *Ruta graveolens* L. nur Arborinin (1-Hydroxy-2, 3-dimethoxy-

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N-methylacridon) gefunden wurde, enthalten die Wurzeln neben einfachen Alkoxy-acridonen die für diesen Pflanzenteil charakteristischen 2-substituierten 5-Hydroxy-6-oxo-11-methyl-2,3,6,11-tetrahydro-furo-[2,3-*c*]-acridine ("Wurzel-Acridone") [1, 2]. Entsprechend verhalten sich Calluskulturen vom Stengel- bzw. Wurzelgewebe, wenn sie im Licht bzw. im Dunkeln kultiviert werden [2, 3].

In Fortführung früherer Arbeiten [1, 4] konnten aus