

MALPIGHIACEAE

ALKALOIDS OF THE LEAVES OF *BANISTEREOPSIS ARGENTEA*

S. GHOSAL and U. K. MAZUMDER

Department of Pharmaceutics, Banaras Hindu University, Varanasi-5, India

(Received 17 March 1971)

Plant. *Banistereopsis argentea* Spring ex Juss.

Occurrence. The species is now being grown in Indian Botanic Gardens, Howrah.¹

Uses. Members of the genus *Banistereopsis* are used in the preparation of narcotic and/or hallucinogenic decoctions by certain Colombian and Peruvian Indian tribes.²

Previous work. A preliminary report based on this work has recently been presented.³

Leaves. Total alkaloids, 0.02%.

Defatted (petroleum 60–80°) plant material (1.8 kg) hot extracted with EtOH. EtOH-extract concentrated under reduced pressure, the residue taken up in AcOH (4%, 200 ml), clarified acidic solution extracted with CHCl₃ at two pH levels (4 and 9), H₂O-soluble bases isolated through their reineckates.⁴

¹ The plant material was obtained through the kind courtesy of Mr. R. Biswas, Indian Botanic Gardens, Howrah.

² A. D. MARDEROSIAN, *Lloydia* 30, 23 (1967).

³ S. GHOSAL and U. K. MAZUMDER, *Abstracts, Convention of Chemists*, IIT, Madras (1970).

⁴ S. GHOSAL, P. K. BANERJEE and S. K. BANERJEE, *Phytochem.* 9, 429 (1970).

(+)-*N_b*-Methyltetrahydroharman. Weakly basic gum from pH level 4, chromatographed (Al_2O_3), first CHCl_3 eluates afforded homogeneous gum (37 mg), sublimed *in vacuo*, crystallized from xylene as flakes (m.p., mixed m.p., co-TLC, $[\alpha]_D^{25}$, UV, IR, m/e 200 (M^+), 199, 197). Methiodide (m.p., mixed m.p. superimposable IR).

N,N-Dimethyltryptamine. Brown oil (48 mg) from middle CHCl_3 eluates (co-TLC, UV). Yellow picrate from MeOH (m.p., mixed m.p.); methiodide (m.p., mixed m.p., IR).

N,N-Dimethyltryptamine-*N_b*-oxide. Hygroscopic solid (26 mg) from MeOH eluates (co-TLC, UV). Reduced with Zn and AcOH to *N,N*-dimethyltryptamine.

Harmine. Basic gum from pH level 9, chromatographed, homogeneous gum (0.11 g) from CHCl_3 eluates, sublimed *in vacuo*, colourless needles (m.p., mixed m.p., UV, m/e). Base hydrochloride from AcMe-MeOH (m.p., mixed m.p.).

(+)-Tetrahydroharmine. Amorphous solid (96 mg) from CHCl_3 -MeOH (99:1) eluates, crystallized from xylene-ether as needles (m.p., mixed m.p., co-TLC, UV, IR, m/e).

Harmaline. Snuff coloured solid (21 mg) from MeOH eluates (m.p., mixed m.p., co-TLC, UV, superimposable IR, m/e).

Choline. Reineckate salt precipitated at pH ~ 8 , passed over De-Acidite FF, regenerated base obtained as hygroscopic solid (0.17 g) (co-TLC, pharmacological properties). Yellow picrate (m.p., mixed m.p.).

Betaine. Regenerated from the reineckate salt, precipitated at pH ~ 1 , as hygroscopic solid (82 mg) (co-TLC). Orange picrate (m.p., mixed m.p.).

New compound. (+)-5-Methoxytetrahydroharman. Pale brown gum from xylene-ether mother liquor, after separation of tetrahydroharmine, $\text{C}_{13}\text{H}_{16}\text{N}_2\text{O}$, m/e 216 (M^+), significant peaks at m/e 215, 213, 201, 187, 170, 169, $[\alpha]_D^{25} +34^\circ$ (CHCl_3), λ_{max} 217, 266-270, 290 (sh)nm. Dehydrogenation with Pd-C gave 5-methoxyharman (m.p., mixed m.p., UV, m/e 212 (M^+), 197, 169, metastable peak at m/e 145, 197 $\rightarrow$ 169 transition requires m^* at m/e 145). Methosulphate of 5-methoxyharman (m.p., mixed m.p., UV, violet fluorescence under UV light on papers).

Uncharacterized indolic bases. EtOH mother liquor, after separation of betaine picrate, was again passed over DeAcidite FF, the regenerated base (12 mg) showed two Dragendorff- and van Urk-positive spots, R_f 0.09 (major), 0.12, $pK_a \sim 10.5$, λ_{max} 224, 272, 294, 305-310 nm. Further characterization of these compounds is in progress.

This is the first report of occurrences of a 5-methoxy tetrahydro- β -carboline alkaloid in nature and of (+)-*N_b*-methyltetrahydroharman in the Malpighiaceae. Although harman type alkaloids have been isolated from many plant families, *N_b*-methyltetrahydroharman appears to have been reported only in the Leguminosae^{5,6} and Chenopodiaceae.⁷

Acknowledgements—The authors are indebted to Dr. B. C. Das, CNRS, Gif-Sur-Yvette, France and to Dr. U. Das Gupta, Department of Physiological Chemistry, Ohio State University, Columbus, for the spectral data.

⁵ S. GHOSAL and P. K. BANERJEE, *Austral. J. Chem.* **22**, 2029 (1969).

⁶ S. R. JOHNS, J. A. LAMBERTON and A. A. SIUOMIS, *Aust. M. Chem.* **19**, 1539 (1966).

⁷ N. K. YURASHEVSKII, *Zh. Obshch. Khim.* **11**, 157 (1941).