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β -PHENETHYLAMINES FROM THE GENUS *GYMNOCACTUS**

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Key Word Index—*Gymnocactus*; Cactaceae; cactus alkaloids; hordenine; *N*-methyltyramine; *N*-methyl- β -phenethylamine.

Plants. Seven species of *Gymnocactus* as listed in Table 1. Living reference specimens are being maintained in our greenhouse. **Source.** All species were obtained from Abbey Garden, Reseda, California and identifications were confirmed by Charles Glass.† **Previous work.** None.

TABLE 1. β -PHENETHYLAMINES IDENTIFIED IN *Gymnocactus* SPECIES

Plant	Alkaloids identified	Yield (%)	Criteria for identification
<i>G. aguirreanus</i> Glass and Foster	Hordenine HCl	2.26	m.p., m.m.p., IR, TLC
	<i>N</i> -Methyl- β -phenethylamine	—	TLC
	<i>N</i> -Methyltyramine	—	TLC
	Unknown alkaloids	—	TLC
<i>G. beguinii</i> (Web.) Backbg.	Hordenine	—	TLC
	<i>N</i> -Methyl- β -phenethylamine	—	TLC
	<i>N</i> -Methyltyramine	—	TLC
	<i>N</i> -Methyl- β -phenethylamine	—	TLC
<i>G. horripilus</i> (Lem.) Backbg.	<i>N</i> -Methyl- β -phenethylamine HCl	0.17	m.p., m.m.p., IR, TLC
	Hordenine	—	TLC
	Unknown alkaloids	—	TLC
	<i>N</i> -Methyl- β -phenethylamine	—	TLC
<i>G. knuthianus</i> (Boed.) Backbg.	<i>N</i> -Methyl- β -phenethylamine	—	TLC
<i>G. mandragora</i> (Fric) Backbg.	<i>N</i> -Methyl- β -phenethylamine	—	TLC
	<i>N</i> -Methyltyramine	—	TLC
	Unknown alkaloids	—	TLC
	<i>N</i> -Methyl- β -phenethylamine	—	TLC
<i>G. roseanus</i> (Boed.) Glass and Foster	Hordenine HCl	2.39	m.p., m.m.p., IR, TLC
	<i>N</i> -Methyl- β -phenethylamine	—	TLC
	<i>N</i> -Methyltyramine	—	TLC
	Unknown alkaloids	—	TLC
<i>G. roseanus</i> var. ? from El Chifloñ, Mexico	Hordenine HCl	1.89	m.p., m.m.p., IR, TLC
	<i>N</i> -Methyl- β -phenethylamine	—	TLC
	<i>N</i> -Methyl- β -phenethylamine HCl	0.04	m.p., m.m.p., IR, TLC
	<i>N</i> -Methyltyramine	—	TLC
<i>G. viereckii</i> (Werd.) Backbg.	Unknown alkaloids	—	TLC
	<i>N</i> -Methyl- β -phenethylamine	—	TLC
	Unknown alkaloids	—	TLC

Present work. While screening a number of *Thelocactus* species for alkaloids, a sample of *G. roseanus*, obtained from Edward F. Anderson, Whitman College, Walla Walla, Washington, showed a surprisingly large quantity of β -phenethylamines. This and the available

* Part XXIII in the series "Cactus Alkaloids". For Part XXII see Ref. 1.

† Editor, *Cactus and Succulent Journal*.

species of this genus were purchased, and the entire freeze-dried plants were screened for alkaloids with TLC using previously reported procedures.¹ In two cases (*G. aguirreanus* and *G. horripilus*) alkaloids were crystallized as hydrochlorides directly from the screening extracts, and in two other cases (*G. roseanus* and *G. roseanus* var. ?) alkaloids were crystallized from larger extractions.² Alkaloids not crystallized were identified by TLC (cochromatography with reference compounds in five solvent systems on SGG). Hordenine and *N*-methyltyramine have been observed previously in several plant families, but never has such a large concentration of hordenine been reported from members of the Cactaceae.³ *N*-Methyl- β -phenethylamine has been previously reported in the Chenopodiaceae⁴ and the Leguminosae,^{4,5} and has recently been isolated from members of the cactus genus *Dolichothele*.^{1,2} No alkaloids were detected in the *Thelocactus* species. The results are summarized in Table 1.

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¹ DINGERDISSEN, J. J. and McLAUGHLIN, J. L. (1973) *Lloydia* **36**, in press.

² DINGERDISSEN, J. J. and McLAUGHLIN, J. L. (1973) *J. Pharm. Sci.* **62**, 1663.

³ SATO, P. T., NEAL, J. M., BRADY, L. R. and McLAUGHLIN, J. L. (1973) *J. Pharm. Sci.* **62**, 411.

⁴ WILLAMAN, J. J. and SCHUBERT, B. G. (1961) Alkaloid Bearing Plants and Their Contained Alkaloids, U.S. Dept. Agr., Tech. Bull. No. 1234, U.S. Gov. Print. Office, Washington, D.C.

⁵ WILLAMAN, J. J. and LI, H.-L. (1970) *Lloydia* **33**, Supplement.

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HEDERAGENIC ACID AND OTHER CONSTITUENTS OF *VIBURNUM ERUBESCENS**

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Key Word Index—*Viburnum erubescens*; Caprifoliaceae; Hederagenic acid; *n*-tritriacontane; β -amyrin; sitosterol; oleanonic acid; oleanolic acid; 2 α -hydroxyursolic acid.

The alcoholic extract of *Viburnum erubescens* Wall. has been reported to show antiviral activity.¹ The chloroform-soluble fraction of the alcoholic extract was defatted with light petroleum and the lipid fraction was subjected to repeated chromatographic separations to obtain substances *A*, *E* and *F*. The defatted chloroform-soluble material was found to contain five compounds *G*, *H*, *I*, *J* and *K* (TLC) which were isolated by column chromatography and preparative TLC.

* CDRI communication No. 1891.

¹ DHAR, M. L., DHAR, M. M., DHAWAN, B. N., MEHROTRA, B. N. and RAY, C. (1968) *Indian J. Expt. Biol.* **6**, 232.