

ALKALOIDS FROM *VOACANGA SCHWEINFURTHII* VAR. *PUBERULA*

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This communication reports on the alkaloids of *Voacanga schweinfurthii* Stapf var. *puberula* Pichon (1), previously known as *Voacanga puberula* K. Schum. Plant material was collected in Zaire and extractions were conducted in the usual fashion (2). The seeds contain a single alkaloid, (–)tabersonine (35g/kg); alkaloids of the stem bark (20g/kg) mainly consist of vobasine and derivatives thereof. The root bark alkaloid mixture (37g/kg) contains bisindole alkaloids, voacamine and voacamidine, along with traces of other bases (see table).

The alkaloid content of *V. schweinfurthii* Stapf var. *puberula* is different from the one of *V. schweinfurthii* Stapf (3); it consists of the three types of alkaloids usually found in the genus *Voacanga*: iboga, α -acylindole and dimers made of vobasinol and of an iboga moiety (4). The presence of large quantities of (–)tabersonine in the seeds is worth being noted.

Compound	Identified by	Found in	Yield (g/kg)	Reference
Tabersonine.....	tlc,uv,ir,ms,nmr,[α]D	seeds	34.9	5
Vobasine.....	tlc,uv,ir,ms,nmr,[α]D	root bark	0.2	5
Perivine.....	tlc,uv,ir,ms,nmr,mp,[α]D	stem bark	7	5
Vobasinol.....	tlc,uv,ir,ms,nmr,[α]D	"	0.1	6
Coronaridine.....	tlc,uv,ir,ms	"	0.1	5
Voacangine.....	tlc,uv,ir,ms	root bark	0.2	5
Ibogaine.....	tlc,uv,ir,ms	"	4	5
Voacamine.....	tlc,uv,ir,ms,nmr	"	0.2	5
Voacamidine.....	tlc,uv,ir,ms,nmr	"	14	5
3-6 oxido voacangine.....	tlc,uv,ir,ms,nmr	"	8	5
		"	0.8	7

*Small quantities of 5 other new alkaloids of undetermined structure were also isolated from the stem bark.

EXPERIMENTAL

GENERAL—see ref. 7.

EXTRACTION AND SEPARATION OF THE ALKALOIDS.—Ground seeds (50g) alkalinized with NH_4OH were lixiviated with 2 liters of petroleum ether. Evaporation gave a gum which was extracted with dilute aqueous H_2SO_4 ; the water was alkalinized with NH_4OH and extracted with chloroform; evaporation yielded 1.1 g of a gum. The dried seeds were again treated with NH_4OH and lixiviated overnight with ethyl acetate; the same treatment as above gave 0.5 g of a gum. The combined extracts showed one spot on tlc, identified as tabersonine.

The stem-bark (250 g) was finely ground and extracted as previously described by means of ethyl acetate. The crude alkaloid mixture (5.02 g) obtained was purified by column chromatography on 100 g silicagel; 160 ml fractions were collected. The solvent was chloroform (f 1–25), then chloroform-methanol (99–1; f 26–44). Vobasine was in fractions 11–25; perivine was in fractions 36–37; vobasinol was in fractions 43–44.

Ground root-bark (300 g), alkalinized with NH_4OH , when lixiviated with ethyl-acetate yielded 13.2 g of crude alkaloid mixture. A 2 g sample of the bisindole bases was separated by means of a LH-20 Sephadex column (85 g; height of the column = 1 m). The solvent was a 7:3 mixture of methanol and chloroform; 10 ml fractions were collected. Voacamine and voacamidine were eluted first in fractions 32–45 (1.5 g); monomers were in fractions 46–70. They were more conveniently separated by chromatography on silicagel. Coronaridine and voacangine were eluted by chloroform; they were followed by 3–6 oxido voacangine [chloroform-methanol (99–1)], voacamine and voacamidine [chloroform-methanol (49–1)], vobasine [chloroform-methanol (19–1)] and ibogaine [chloroform-methanol (10–1)].

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LITERATURE CITED

1. M. Pichon, *Bull. Museum Hist. Nat.*, **19**, 409 (1947).
2. T. Mulamba, C. Delaude, L. Le Men-Olivier and J. Lévy, *Lloydia*, **44**, 184 (1981).
3. F. Fish, F. Newcombe and J. Poisson, *J. Pharm. Pharmacol.*, **12**, 4 (1960).
4. F. Puisieux, M. B. Patel, J. M. Rowson and J. Poisson, *Ann. Pharm. Fr.*, **23**, 33 (1965).
5. B. Gabetta and E. Mustich: spectral data of indole alkaloids, Invernici della Beffa, Milan (1975).
6. J. A. Weisbach and B. Douglas, *Lloydia*, **27**, 374 (1964).
7. A. M. Morfaux, T. Mulamba, B. Richard, C. Delaude, G. Massiot and L. Le Men-Olivier, *Phytochemistry*, **21**, 1767 (1982).