

## Baeocystin, a Mono-Methyl Analog of Psilocybin from *Psilocybe baeocystis* Saprophytic Culture

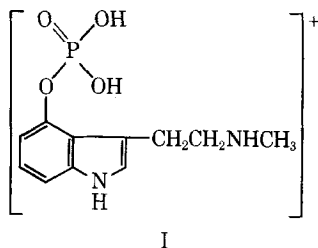
Sir:

The occurrence of psilocybin and/or psilocin in *Psilocybe baeocystis* Singer and Smith has been reported (1-3). During the authors' investigations of the indole derivatives of this fungus, an unknown compound was observed by thin-layer chromatography (3) in extracts of wild carpophores and of mycelial pellets formed in submerged culture. The compound, named baeocystin, exhibited the same color reactions with Ehrlich's reagent and with a modified phosphate reagent (4) as did psilocybin. The  $R_f$  values of psilocybin and baeocystin were similar but the compounds were separable using a two-dimensional technique (3). Baeocystin was not detected in extracts of carpophores of *Psilocybe strictipes* Smith, *Ps. caerulipes* Peck, *Ps. pelticulosa* Smith, or *Ps. atrobrunnea* (Lasch) Gillet.

The organism was grown in submerged culture, the mycelial tissue freeze-dried, and extracted as described previously (3). The extract was evaporated to dryness and chromatographed on a powdered cellulose column using 1-butanol saturated with water as the eluant. Fractions richest in psilocybin and baeocystin were combined, concentrated to dryness, and the residue was crystallized from hot methanol. This crystalline material was rechromatographed on a silicic acid column using 1-propanol-5% ammonium hydroxide (5:2) as the eluant. Fractions containing psilocybin and those containing baeocystin were concentrated to dryness and the residues were crystallized from hot methanol. From 23 Gm. of freeze-dried tissue, 10 mg. of psilocybin and 6.5 mg. of baeocystin were isolated.

Baeocystin (m.p. 254-258° dec.) showed a U.V. spectrum identical with psilocybin, indicating it to be a 4-substituted indole derivative (5), yet different from psilocin (6). The I.R. spectrum exhibited primary or secondary amine absorption bands at 3275  $\text{cm}^{-1}$  and 1640  $\text{cm}^{-1}$  which are absent in the I.R. spectrum of psilocybin (6).

The mass spectrum<sup>1</sup> showed a weak molecular ion peak at  $m/e = 270$ , corresponding to I, a



strong peak at  $m/e = 190$ , which corresponds to the dephosphorylated species, and a strong peak at  $m/e = 44$  [ $\text{CH}_2 = \overset{+}{\text{N}}\text{HCH}_3$ ]. The mass spectrum of psilocybin showed a weak molecular ion peak at  $m/e = 284$  and both psilocybin and psilocin showed strong peaks at  $m/e = 204$  and  $m/e = 58$  [ $\text{CH}_2 = \overset{+}{\text{N}}(\text{CH}_3)_2$ ].

Apart from these differences, all three compounds showed similar fragmentation patterns with prominent peaks at  $m/e = 160, 159, 146, 130,$  and  $117$  in their mass spectra, the structures of which have been postulated.

Thin-layer chromatography and color reactions, U.V., I.R., and mass spectra indicate that baeocystin is the monomethyl analog of psilocybin. This report constitutes the first on its isolation from nature. The pharmacology and clinical applications in mental disease await future investigations.

Details of the isolation and characterization procedures will be reported at a later date.

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