The percentage content of sphaerophysine benzoate was calculated from the formula

$$C = \frac{D \cdot 50 \cdot 25}{E^{1\%}_{1\text{cm}} \cdot p \cdot 2},$$

where D is the optical density. $E^{1\%}_{1\text{cm}}$ is the specific absorption index, which is 229.33±8.65, and p is the weight of the sample, g.

The results of the determination are given below:

Weight of sample, g	Found, %	Metrological characteristics
0,0124	98,90	$\bar{X} = 99{,}60$
0,0156	99,58	$S = 0{,}451$
0,0174	100,24	$Sr = 0{,}0045$
0,0183	99,78	$St = \pm 1{,}11$
0,0229	99,73	$\bar{X} \pm St = 99{,}60 \pm 1{,}11$
0,0200	99,34	

The method developed is characterized by high sensitivity and by accuracy of the results. The relative standard deviation Sr does not exceed 0.0045.

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MACRANTALINE — A MINOR ALKALOID OF *Papaver lisae*

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Protopine, isocorydine, mecambridine, oridine, and N-methyloridine have been isolated previously from the epigeal part of *Papaver lisae* N. Busch [1].

In an investigation of the epigeal part of *P. lisae* collected in North Ossetia in the mass flowering phase, we have obtained the total alkaloids with a yield of 0.35% on the weight of the dry raw material. By using the method of separation into phenolic and nonphenolic alkaloids the solubilities of the hydrochlorides in chloroform, and column chromatography, from the total alkaloids, in addition to protopine, isocorydine, mecambridine, and oridine, we have isolated a nonphenolic base new for this plant, with mp 140-141°C (from acetone—diethyl ether—petroleum ether), $[\alpha]_D^{19}$ +30.2±0.3° (c 3.4; chloroform).

The UV spectrum of the base (in methanol) has absorption maxima at 285, 238 nm (log ε 3.64 and 4.04) and a minimum at 256 nm (log ε 2.95, corresponding to the isoquinoline bases). According to the IR spectra, the base contains no carbonyl group, but it does contain a hydroxy group bound by an intramolecular hydrogen bond (3150 cm^{-1}).

The mass spectrum of the base contains peaks at m/e 220 (100%) and 205 (20%) and according to the PMR spectrum the alkaloid contains a N-CH_3 group (3 H, singlet at 2.19 ppm), three OCH_3 group (3 H, singlet at 4.16 ppm, 3 H, singlet at 3.82 ppm, and 3 H, singlet at 3.86 ppm), a methylenedioxy group (2 H, singlet at 5.84 ppm), and one isolated and two ortho aromatic protons (1 H, singlet at 6.29 ppm, 1 H, doublet at 6.81 ppm, and 1 H, doublet at 7.04 ppm, J = 7 Hz). The PMR spectrum also contained two one-proton doublets with J = 10 Hz at 4.39

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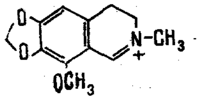
and 4.82 ppm, a one-proton quartet at 3.67 ppm, and a six-proton group of signals in the 2.40-3.40 ppm region.

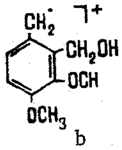
The total number of hydrogen atoms in the molecule calculated from the integral PMR curve is 27, and the number of oxygen atoms 6. Thus, the peak with m/e 220 in the mass spectrum corresponds not to the molecular ion but to a fragmentary ion, and the ion with a mass number of 205 was formed from the ion with m/e 220 by the ejection of a methyl group (15 amu), as is shown by the presence of a metastable ion with m/e 191.2. The nature of the mass spectrum permitted the assumption that this alkaloid belonged to the bases of the benzyltetrahydroisoquinoline type and also permitted the ion with m/e 220 to be assigned structure a on the basis of the PMR spectrum.

The mass spectrum obtained by the field desorption method actually showed the molecular ion with m/e 401 (17%) and, together with ion a (m/e 220), an intense ion with m/e 181 (40%) corresponding to the second fragment of the molecule which, on the basis of the PMR spectrum, must have the structure b.

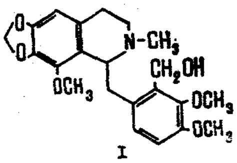
By comparing these two fragmentary ions a and b and taking into account the existence of an intramolecular hydrogen bond, we have proposed structure (I) for the alkaloid isolated.



a



b



I

The structure (I) corresponds to the alkaloid macrantaline recently isolated by Sariyar and Phillipson from *Papaver pseudo-orientale* (Fedde.) Medw. [2].

A comparison of the constants and spectra of the alkaloids that we have isolated and of macrantaline confirmed the correctness of this hypothesis. Consequently, *P. lisae* contains (+)-macrantaline as a minor component.

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