

PHENAZINE DERIVATIVES FROM *Pseudomonas*

SP. STRAIN 2/3

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In a study of the reason for the phytotoxic properties of the soil bacterium *Pseudomonas* sp., strain 2/3, we found that an ethereal extract of this microorganism grown on an agarized medium containing glycerol [1] contained (according to paper chromatography under the conditions described by Gerber et al. [2]) at least five pigments which inhibited the growth of the seeds of a number of plants to different extents.

Pigments F-1, F-2, and F-3, which predominated in the ethereal extract, were isolated in the individual states by chromatography on a column of silica gel (KSK, 70-200 mesh) with an average yield of 2-3 mg/dm² of solid nutrient medium.

F-1 formed lemon-yellow needles, mp 239-240°C (methanol), % N 12.7; ν_{\max} (paraffin oil), cm⁻¹: 1740, 1667, 1600, 1563, 1525, 1473, 1430, 1362, 1270, 1240, 1140, 885, 865, 760; $\lambda_{\max}^{\text{CH}_3\text{OH}}$ 250, 365 nm.

F-2 formed dark orange needles, decomp. > 220°C (methanol), % N 11.5; ν_{\max} (paraffin oil), cm⁻¹: 1670, 1630, 1610, 1570, 1470, 1370, 1270, 1130, 995, 970, 855, 770; $\lambda_{\max}^{0.1 \text{ N HCl}}$ 260, 275 nm.

F-3 formed yellow-green crystals, mp 252°C (benzene), % N 14.47; ν_{\max} (paraffin oil), cm⁻¹: 1635, 1605, 1480, 1460, 1288, 1230, 1203, 1125, 860, 830 $\lambda_{\max}^{0.1 \text{ N HCl}}$ 215, 263, 390 nm.

On the basis of the facts given above and literature information [3] and also by a direct comparison with a synthetic sample which we obtained by the method of Mokrushin et al. [4], the pigment F-1 was identified as phenazine-1-carboxylic acid.

The IR and UV spectra of pigment F-2 were identical with those given in the literature [5, 6] for 2-hydroxyphenazine-1-carboxylic acid. Substance F-3 was identified by its physicochemical and spectroscopic characteristics as 2-hydroxyphenazine [7-9].

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