COMPOSITION OF METABOLITES OF MYCELIUM OF THE FUNGUS Eremothecium ashbyi

A. N. Pogorel'skaya and P. S. Bugorskii

UDC 582.282

It has been reported previously [1] that the mycelial fungus Eremothecium ashbyi is capable of producing essential-oil components, in addition to riboflavin [1].

In order to study features of the metabolism of aromatic substances, we have investigated the composition of the metabolites of the mycelium of the fungus, information on which is extremely sparse [2]. The fungal strain BKMF-3009 was cultivated on nutrient medium [1] for two days. The mycelium was filtered off (2. 95 g of dry biomass in 1 liter of culture liquid) and was extracted with hexane. This gave 5.5 mg/g of lipids (here and below, in milligrams per 1 g of dry mycelial biomass) containing only 0.3 mg of essential-oil components (80.2% of geraniol; 5.7% of citronellol; 4.5% of β-phenylethanol; etc.). The amount of riboflavin in the mycelium was also low — 7.4 mg.

From the mycelium 80% ethanol extracted a fraction of ethanol-soluble substances in which 16.4 mg of soluble sugars was determined by the phenol method [3]; they contained, according to GLC [4], glucose, mannose, and arabinose in a ratio of 20.6:1:1.3. On an amino acid analyzer (AAA T-399, Czechoslovakia) 17 free amino acids (7.6 mg) were detected, the predominating ones being glutamic acid (38.4%), cystine (18.9%), and proline (17.7%).

The dry biomass contained mainly polysaccharides (611.6 mg, according to the anthrone method [3]) which were identified after acid hydrolysis as mannan (22.3%) and glucopolysaccharides. Only glucose was detected in the residue from the mycelium (10.3%) after sulfuric acid hydrolysis [5], and this gave grounds for identifying it as cellulose.

In the protein fraction (39 mg by Lowry's method) after hydrolysis the same amino acids were found as in the free amino acids, the main components being 13.5% of aspartic acid, 9.4% of glutamic acid, 9.1% of lysine, 9.1% of phenylalanine, and 7.6% of tyrosine. The amounts of RNA (31.2 mg) and of DNA (43.5 mg) in the mycelium were determined by a spectrophotometric method [6].

Thus, the mycelium of the fungus E. ashbyi contains various metabolites among which polysaccharides predominate, with relatively small accumulations of lipids and riboflavin.

LITERATURE CITED

1. P. S. Bugorskii, V. S. Rodov, and A. M. Nosov, Khim. Prir. Soed., 790 (1986).
2. V. V. Shchegolev, Author's abstract of dissertation for Candidate of Technical Sciences [in Russian], Voronezh (1974), p. 32.
3. M. V. Turkina and S. V. Sokolova, Biochemical Methods in Plant Physiology [in Russian], Nauka, Moscow (1971), p. 7.
4. F. L. Minchuk, V. I. Zinchenko, and V. V. Krakhmalyuk, Izv. VUZov, Pishch. Tekhnol., No. 4, 154 (1975).
5. N. F. Pisarenko, Biochemical Methods in Plant Physiology [in Russian], Nauka, Moscow (1971), p. 35.
6. A. S. Spirin, Biokhimiya, 23, No. 4, 656 (1958).

All-Union Scientific-Research Institute of Essential-Oil Crops, Simferopol'. Translated from Khimiya Prirodnykh Soedinenii, No. 3, pp. 446-447, May-June, 1988. Original article submitted August 3, 1987; revision submitted December 4, 1987.

 0009-3130/88/2403-0382$$12.50