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Abstract
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Considerable early stimulation of conidial differentiation (3rd day) without impediment for subsequent protoperithecial formation (9th day) has been observed in Neurospora crassa grown in the Westergaard and Mitchell liquid medium containing, in addition to its usual nitrate 0.1% and sucrose 2%, a supplement of 10^{-2} M Na citrate or succinate.

Furthermore, with Na malonate (10^{-1} M) as the organic acid source, protoperithecial differentiation is inhibited and thereby exclusively highly conidiated cultures are produced (Turian, G., Abstr. VIII Intern. Congress Microbiology 1962, A2.9).

The conidiogenous effect of these organic acids is suppressed when a mineral NH_4 + salt such as $(NH_4)_2 HPO_4$ is substituted for the usual nitrogen source, KNO_3. Thus, the nitrate reduction processes are in some way necessary for the morphogenetic action of the organic acids in the presence of sucrose.

In Neurospora crassa, grown in the presence of other organic acids than acetate, the isocitratase and therefore the glyoxylate cycle is either repressed (with citrate or succinate) or only slightly, endogenously induced (in the presence of malonate). On the other hand, the Krebs cycle through the deficiency of its succinic dehydrogenase step is for the most part inactive in the conidia (Zalokar, M., 1959, Amer. J. Bot. 46, 555; Turian, G., 1960, Path. Microbiol. 23, 687), so that heavy conidial differentiation can occur in the presence of malonate. Therefore, another oxidative metabolic pathway must function in the conidial formation induced by the triple combination nitrate - sucrose - organic acid.

The dependability of this process on the nitrate reduction mechanism (using TPNH+---TPN) was suggestive of the functioning of the TPN-mediated direct oxidation of glucose (from sucrose) or hexosemonophosphate shunt, the whole process and especially its initiation being stimulated by the additional presence of an organic acid as H^+ donor.

Preliminary enzymatic measurements, using conventional spectrophotometric methods on cell-free extracts of N. crassa, have confirmed this view. Up to 9 times enhancement of the activity of the glucose-6-phosphate dehydrogenase has been measured in the extracts of the heavily conidiated cultures from the nitrate-sucrose-malonate medium compared to the low dehydrogenase activity of the nitrate-sucrose controls. A similar high activity of the glucose-6-phosphate dehydrogenase has been detected in the young (3-5 days) conidial extracts of the citrate cultures. In the extracts of older citrate cultures (6-9 days), however, the slight succinic dehydrogenase activity measured seemed compatible with the subsequent initiation of protoperithecial differentiation. ---Institute for General Botany, University of Geneva, Geneva, Switzerland.