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Abstract

Phosphate mediated changes in phospholipids in *Neurospora crassa.*

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Phosphate mediated changes in phospholipids in *Neurospora crassa*

Earlier, we reported the effect of inorganic phosphate an some enzymes of carbohydrate metabolism and carotenogenesis, indicating its influence on both primary, as well as secondary metabolism in wild type, carotenogenic *Neurospora crassa* (S. Savant, N. Parikh and H.S. Chhatpar, 1982 Experientia 38: 310-311).

Further, we have observed significant changes in cellular morphology and an accumulation of intracellular material, probably polyphosphate granules, in high phosphate conditions. (Polyphosphate content was found to be higher in high phosphate as compared to low phosphate conditions). The significant changes in the morphology led us to analyse changes in the lipid and phospholipid contents under these phosphate induced conditions.

TABLE I.

Effect of inorganic phosphate on phospholipid composition of *Neurospora crassa*

"l Phospholipids	Percentage of total phosphalipids	
	Low phosphate grown culture	High phosphate grown culture
Sphingomyelin	16.90	9.30
Phosphatidyl choline	15.49	20.00
Cardiolipin	Il.27	16.00
Phosphatidyl ethanolamine	14.08	17.33
Phosphatidic acid	12.67	16.00
Phosphatidyl inositol	Il.27	9.30
Lysolecithin	15.49	12.00

The synthetic liquid medium employed for the growth contained per litre: glucose, 50 g; trisodium citrate, 2.5 g; $(NH_4)_2SO_4$, 2.5 g; $MgSO_4.7H_2O$, 0.5 g; $ZnSO_4.7H_2O$, 2.5 mg; $FeCl_3$,,5.0 mg; $CaCl_2$,,10 mg; biotin, 100 µg. The pH was adjusted to 5.6. "High-phosphate" condition indicates the addition of KH_2PO_4 1.0 g% whereas "low-phosphate" condition indicates the addition of 0.1 g% KH_2PO_4 to above medium. These phosphate conditions did not change the pH of the medium.

After separation by silica gel TLC using chloroform: methanol: water (65:25:4), phospholipids were eluted out and phosphate was determined according to the method of Barlett (1959 J. Biol. Chem. 234: 468).

The total lipids were found to be accumulated too much higher levels in cells grown in high-phosphate medium. Total phospholipids showed no qualitative difference, but individual phospholipids showed significant changes. That is, sphingomyelin, phosphatidyl choline and cardiolipin registered difference to a higher extent than phosphatidyl ethanolamine, phosphatidic acid, phosphatidylinositol and lysolecithin (Table I). These significant changes in the phospholipid pattern suggest that phosphate may be playing an important role at the membrane level (uptake and permeability functions?) in addition to playing a significant role in primary and secondary metabolism. - Department of Microbiology, Faculty or Science, M. S. University of Baroda, Baroda 390 002, India,