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## Effect of pyridoxal deficiency on biotin content of *N. sitophila*

### Abstract

Effect of pyridoxal deficiency on biotin content of *N. sitophila*

Aurich, H. and J. Hofmann. Effect of **pyridoxal**

deficiency on biotin content of *N. sitophila*.

concentration of the culture medium. The **results** are presented here.

The fungus was cultured at 30°C for 6 days in 300 ml **Erlenmeyer flasks** on the medium of **Ryan et al. (1943 Am. J. Botany 30: 784)**, containing different concentrations of pyridoxine hydrochloride. Ammonium tartrate was used as the sole nitrogen source (5 g/l) and glucose as the sole carbon source (20 g/l). The biotin concentration of the culture medium was held at 5.0 µg/l in all experiments. A very dilute suspension of conidia was used as inoculum. After incubation, we followed the growth of the fungus by measuring the weights of the **mycelial pads** after drying at 80°C. For biotin and pyridoxine **determinations**, the **mycelial pads** were washed, dried, homogenized by grinding in a mortar and then hydrolyzed in 1 N HCl (100 mg dry weight/ 10 ml HCl) at 120°C for 2 hours. After neutralization, the **extracts** were filtered and brought to an adequate volume. The biotin concentrations in these **extracts** were determined by the method of Horowitz and Beadle (1943 J. Biol. Chem. 150: 325) as modified by Hodson (1945 J. Biol. Chem. 157: 383) using *N. crassa* 3a6A (FGSC# 955) as test organism. The pyridoxine concentrations of the extracts were determined by the method of **Stokes et al. (1943 J. Biol. Chem. 150: 17)** using *N. sitophila* 299 as test organism.

Table 1 shows the change in biotin and **pyridoxine** content of dried mycelio in relation to the pyridoxine concentrations of the medium. The **standard errors** of the vitamin **assays** are ± 10% for pyridoxine determination and about ± 13% for biotin determination. With increasing amounts of external pyridoxine the pyridoxine content of the mycelio increases, **too**, while the biotin concentrations exponentially decrease. At a concentration of 5 µg pyridoxine/l culture medium, the **pyridoxine/biotin** quotient is 4.4; with 75 µg pyridoxine/l medium, the quotient is 82.0. We propose **two possible causes** of these effects and interrelationships. First, in pyridoxine deficiency the cell **membranes** of the fungus may be damaged and **allow** a high influx of biotin. Second, pyridoxine **may** inhibit the permeation of biotin through the cell membrane. \* \* \* Section of Biological Sciences, Department of Biochemistry, **Karl Marx University, Leipzig, D.D. R., Germany.**

Interrelationships between pyridoxine deficiency and biotin **uptake** in microorganisms have not yet been described. Therefore, we studied the biotin and pyridoxine content in **mycelia** of *N. sitophila* 299 (FGSC# 348), a pyridoxine and biotin **requirer**, in relation to the pyridoxine con-

Table 1. Change in biotin and pyridoxine content of dried mycelia in relation to pyridoxine concentration of the culture medium.

Pyridoxine· HCl (µg/l)	Mycelial dry wt. (mg/flask)	Pyridoxine (µg/g dry weight)	Biotin
5	15	5.1	1.17
15	27	7.4	0.62
30	42	9.0	0.36
50	55	11.2	0.25
75	64	12.3	0.15

First, in pyridoxine deficiency the cell **membranes** of the fungus may be damaged and **allow** a high influx of biotin. Second, pyridoxine **may** inhibit the permeation of biotin through the cell membrane. \* \* \* Section of Biological Sciences, Department of Biochemistry, **Karl Marx University, Leipzig, D.D. R., Germany.**