

Aspergillus giganteus Wehm. mut. *alba* Zurz.

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The mutant of *Aspergillus giganteus* appeared in a dark culture of this microorganism as a group of 4—5 conidiophores with white conidial heads among a dense mass of short conidiophores with blue heads. The fact that the initial cultures were inoculated with a spore suspension excludes temperature as the direct cause of this mutation — in contrast to mutants of *Aspergillus versicolor* (*Eurotium herbariorum*) obtained by Barnes (1928). After isolation the mutant has been cultivated for 10 years without any change of its characteristic features.

Colonies of *A. giganteus* m. *alba* develop rapidly on synthetic nutrient solutions, on solutions with yeast water and on solidified media (Zurzycka 1955). They form mycelia sporulating already after

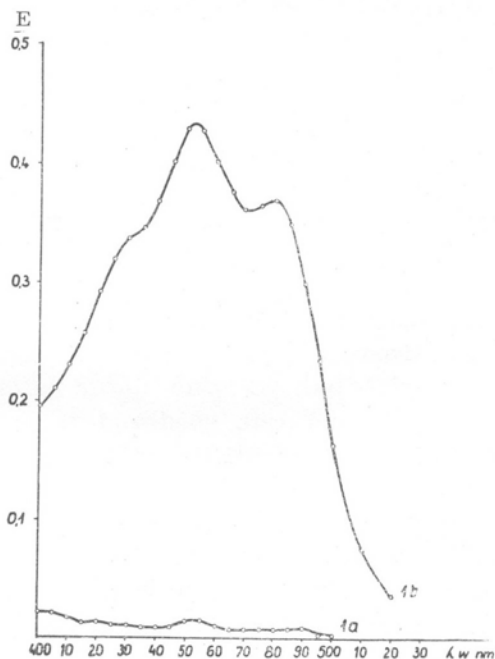


Fig. 1. Absorption spectra of pigments of *A. giganteus* m. *alba* (extracted with ether), grown in darkness (1a) and in light (1b).

three days of culture. The development of mycelia and conidiophores is completed after 7—9 days on agar media, whereas on liquid ones 12 days of cultivation are necessary. Fully developed cultures produce

into the medium substances of dark brown colour and this process seems to be associated with a strong foetid odor.

A. giganteus m. *alba* from dark cultures develops very numerous but exclusively short conidiophores. The elongation coefficient (vesicle length/breadth) is 1.14. In the light the fungus produces primarily short conidiophores identical with those grown in dark cultures. Between the 3—5th day higher (10 mm long) conidiophores are formed. Towards the end of the growth period (cultures 5—7 days old) the longest conidiophores (mean height 25 mm) appear. The sequence of formation of the conidial layers is characteristic of this strain. The length of the conidiophores, however, of the two upper layers is considerably influenced by external conditions (first of all by the light intensity, the length of the period of illumination and the kind of medium). A detailfull analysis of long conidiophore formation and its dependence on the light conditions will be presented elsewhere (Zurzycka in elab.).

Conidial heads of two upper layers are clavate. The elongation coefficient — 3.38 — differs considerably from the coefficient of short conidiophores. There are no discernible morphological differences between the spores from darkness and light.

It results out of the data summarized in Table 1 that light induces an increase of conidiophore length and modifies the shape of conidial heads.

	Light cultures	Dark cultures
Dry weight on synthetic medium at 20°	218.4 mg	189.9 mg
The rate of growth in Ryan's tubes at		
20°	0.39 cm/24 h	0.40 cm/24 h
30°	0.60 cm/24 h	0.60 cm/24 h
Mean length of conidiophores:		
1th layer	3.5 mm	3.5 mm
2nd layer	10.0 mm	—
3d layer	25.0 mm	—
Mean length of conidial heads:		
1th layer	158.3 μ	158.3 μ
2nd layer	196.6 μ	—
3d layer	388.0 μ	—
Vesicle: mean length \times mean breadth	124.8 \times 36.9 μ	27.5 $\mu \times$ 24.2 μ
Length of the sterigmata (measured only in the apical part)	10—12 μ	10 μ
Spores: length		2.9—5.7 μ
breadth		(av. 4.8 μ)
		2.9—4.6 μ
		(av. 3.6 μ)

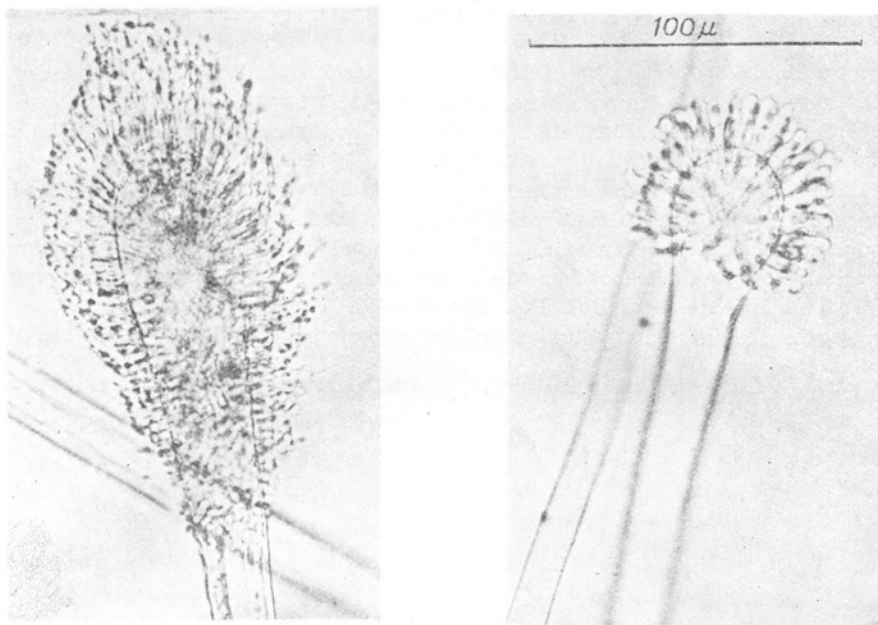


Fig. 2. Conidial heads of *A. giganteus* m. *alba* from light culture (left) and from dark culture (right)

Young mycelia grown in darkness are bright white and acquire a brownish shade in very old cultures. The absorption spectrum of pigments extracted from 7 days old cultures is presented in Fig. 1a. The mycelia and the conidiophores grown in light have an intensively yellow-orange colour. The shape of the absorption curve indicates the presence of carotenoid pigments (Fig. 1b). It should be pointed out that Gardner (1949) already established the occurrence of those pigments in the mother organism.

It results from the comparison of data in Table 1 with the description of *A. giganteus* given by Thom and Raper (1945) that the mutant differs from the initial strain only by the absence of pigmentation in thin-walled spores. It has been also found that the reaction of the mutant to the light conditions is more uniform. It develops long conidiophores in light only, whereas *A. giganteus* (obtained from the Centraal Bureau voor Schimmelcultures in Baarn), grown in darkness forms occasionally scarce long conidiophores (about 10–15 mm long) dispersed among short ones.

A. giganteus mut. *alba* is kept in culture in the Institute of Plant Physiology of the Jagellonian University in Cracow and in the Centraalbureau voor Schimmelcultures in Baarn.

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