OXIDATIVE STRESS-RESPONSE OF EXTREMOPHILIC FUNGI ISOLATED FROM THE REGION OF CHERNOBYL ATOMIC ENERGY STATION (CHAES)

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Background: Directional growth of hyphae towards a selected collimated radiation source was observed in some species of the ChaES fungi¹. Mechanisms of growth-promoting effect of ionizing radiation on mycelial fungi remains obscure.

Objectives:

1. Creation of phenomenological model to analyze development of mycelial fungi colonies in a H₂O₂ gradient created by a local source of ionizing radiation.
2. To study of responses of ChaES fungi to H₂O₂, and various glucose concentration in the medium.

Methods:

1. Morphological responses were studied via video image microscopy
2. Protein carbonyl content was used as a marker of oxidative stress

Results:

1. A phenomenological model of fungal colony growth has been suggested.
2. A profound adaptation slowdown reaction in growth rate as a result of the first 10-30 min H₂O₂ action has been observed in Paecilomyces lilacinus ChaES strain N 1941 in comparison to strains from places with background radioactivity. Maximal radial growth rate of the strain N 1941occurred on the medium with 0.2% glucose in contrast to seven control strains.

Conclusions:

1. Model allows estimating the influence of H₂O₂ spatial distribution on colony form during fungal growth and expansion.
2. In the strain from ChaES zone adaptation to low glucose concentration in the medium (0.2%) was coupled to an increased resistance to oxidative stress.

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