

Changes in growth patterns and intracellular calcium concentrations in *Aspergillus awamori* treated with amphotericin B

Abd El-Rahman A., Kozlova O., El-Shafei S., Alimova F., Kupriyanova-Ashina F.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Pleiades Publishing, Ltd. Growth patterns and intracellular Ca^{2+} concentrations in the mutant strain *Aspergillus awamori* 66A containing a recombinant aequorin gene were studied in the presence of a permeabilizing fungicidal agent amphotericin B. The cell response, i.e., changes in the growth and development of the fungus (initiation of spore germination, mycelial growth, and intensity of sporulation) was dose-dependent. Low concentrations of amphotericin B (2.5 μM) stimulated spore germination: the number of germinating spores was 2–3 times higher than in the control (without the fungicide). At higher amphotericin concentrations (20 μM) spore germination was inhibited. Amphotericin B had a dose-dependent effect on mycelial growth and sporulation intensity on solid Vogel medium. Intracellular Ca^{2+} concentrations in the presence of amphotericin B were investigated using the luminescence of the photoprotein aequorin. High concentrations of amphotericin B (10 and 20 μM) were shown to cause an instantaneous increase in Ca^{2+} concentrations compared to the control and lower amphotericin concentration (2.5 μM). Ca^{2+} concentrations remained elevated throughout the experiment and correlated with the inhibition of mycelial growth and development.

<http://dx.doi.org/10.1134/S002626171404002X>

Keywords

amphotericin B, *Aspergillus awamori*, Ca^{2+} , Ca^{2+} dynamics, cell response, permeabilizing fungicide, recombinant aequorin, signaling, sporulation