TITLE: CAPACITY RESISTANCE OF ENDOPHYTIC FUNGI THE MERCURY

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Abstract:

Contamination of biological systems by mercury represents a global concern, given the difficulty of degradation, persistence and potential toxicity of this metal in the environment. Remediation strategies of soils contaminated with mercury are required and the use of microorganisms as bioremediation agents is fully justified, in particular, the various mechanisms of tolerance to heavy metals allocated to them, particularly for fungi arising from various chemical processes, such as transformation valence, intra and extracellular precipitation and oxidation. Our hypothesis is that endophytic fungi isolated from areas contaminated by mercury present higher resistance to this metal. For this, three endophytic fungi (*Aspergillus japonicas* A10, *Microsphaeropsis arundinis* A36 and *Trichoderma brevicompactum* P35) isolated from a contaminated area and two from an uncontaminated area (*Cladosporium cladosporioides* A72 and *Phlebiopsis gigantea* A75) had the mercury resistance tested. The fungi were activated in PDA medium for 7 days. Discs of mycelium were inoculated in BDA+mercury medium at different concentrations (0, 30, 90; 150, 300, 450 and 600 $\mu g.mL^{-1}$) with three repeats. The growth rate (μ) was determined daily until the stationary phase of each fungi and their calculation defined by equation $\mu = S (D-Da) / N$, where: D = current average diameter, Da= previous average diameter and N = number of days in the tested range. The datas were submitted to ANOVA and Tukey test. The mercury concentration that completely inhibited the growth of the fungi was considered as Minimal Inhibitory Concentration (MIC). All fungi showed MIC of 450 $\mu g.mL^{-1}$ of Hg, except for *P. gigantea* A75 which showed growth inhibition at a dose of 600 $\mu g.mL^{-1}$ of Hg. The reduction in growth rate was statistically verified for *A. japonicus* A32 the lowest concentration of mercury (30 $\mu g.mL^{-1}$ of Hg) for *C. cladosporioides* A72 above this concentration compared to the control. *T. brevicompactum* P35 and *M. arundinis* A36 not undergo restrictions in growth up to 90 $\mu g.mL^{-1}$ of Hg. As for *P. gigantean* A75, the restricting in the growth was observed only in 300 $\mu g.mL^{-1}$ of Hg, this species was isolated from an uncontaminated area, rejecting therefore, our hypothesis. *P. gigantea* A75, *M. arundinis* A36, *T. brevicompactum* P35 were the most tolerant to mercury. Their potential for bioaccumulation and interaction with its host will be targets future studies, to support environmental biotechnology strategy.

Keywords: MIC, wetland, heavy metal, bioremediation

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