TITLE: INTERACTION BETWEEN *Yarrowia lipolytica* AND AQUATIC PLANTS PROMOTE VEGETABLE GROWTH WITH POTENTIAL FOR BIORREMEDIATION OF METAL

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ABSTRACT: *Typha domingensis* and *Salvinia auriculata* are aquatic plants able to remove water pollutants, including metals, moreover, act as bioindicators of pollution in eutrophic areas. These plants are also used for wastewater treatment. Such features can be associated with interaction with beneficial microorganisms able to promote plant growth and increase the efficiency of contaminant removal, assisted bioremediation. Thus, the objective of this work was to evaluate the potential for promoting plant growth and bioremediation of environments contaminated by metals using aquatic plants and microorganisms isolated from *T. domingensis*. So, plants of *T. domingensis* were collected in Campelon and Açu ponds, located in the northern region of Rio de Janeiro, getting 41 microbial isolates. Sequencing of ribosomal genes revealed 23 species of bacteria and one species of yeast, *Yarrowia lipolityca*. In tests, the yeast was able to produce indole compounds, solubilize inorganic phosphate and had high resistance metal, showing the following minimum inhibitory concentrations in mmol L^{-1}: 23 for $CuSO_4$; 0.3 to $CdCl_2$; 21 for $CoCl_2$; and 40 for $ZnSO_4$, solid DYGS medium. Based on these results, *Y. lipolityca* was inoculated into *S. auriculata*, used as a model plant in the greenhouse. It was observed significant increase in fresh and dry weight (20% and 7%, respectively), compared to plants not inoculated, after 8 days. There were also 30% increase in the rate of plant growth. These parameters significantly reduced in plants uninoculated and incubated with 0.01 mmol L^{-1} $CuCl_2$. Previously inoculated plants and transferred to solution containing the metal did not show significant differences compared to the control, without added metal and yeast. It was also possible to verify that the stress caused by oxidative damage to metal plant cells, increasing the extravasation of electrolytes in 14%. However, plants previously inoculated with *Y. lipolityca* not suffered this effect, having the yeast protective effect on the plant under stress. This is the first work, to our knowledge, on the interaction of *Y. lipolytica* with aquatic plants, and its possible to conclude that the microbial inoculation promoted biomass increment in *S. auriculata* and that the establishment of this interaction has favored the plant growth in the presence of copper.

KEYWORDS: *Typha domingensis*, *Salvinia auriculata*, microorganisms, copper

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