

Temperature changes interspecific relationships among aquatic hyphomycetes

Sofia Duarte^{*}, Isabel Fernandes, Maria João Nogueira, André Pinheiro, Fernanda Cássio and Cláudia Pascoal

Centre of Molecular and Environmental Biology (CBMA), Department of Biology, University of Minho, Braga, Portugal

*sduarte@bio.uminho.pt

Aquatic hyphomycetes are an ecological group of fungi that play a key role in plant detritus decomposition in streams. Temperature is an important environmental factor influencing the occurrence and distribution of aquatic hyphomycetes. According to the Intergovernmental Panel on Climate Change, air temperature is predicted to increase 1.8°C to 4.0°C until the end of this century and, therefore, it is important to ascertain how increasing temperature can affect the interspecific relationships among aquatic hyphomycetes. In this work, we compared the radial growth rates of four widespread aquatic hyphomycete species (*Lunulospora curvula*, *Heliscus submersus*, *Articulospora tetracladia* and *Varicosporium elodeae*) in all possible combinations of 1 to 4 species at different temperatures. Malt extract agar plates were inoculated with agar plugs collected from the edge of 15-day-old colonies of the 4 fungi in monocultures or in multicultures keeping the total inoculum size constant. Cultures were kept at 13.5°C, 16°C and 27°C, and the radial growth was measured every 3 days, during 12 days. When fungal species were grown alone, growth rates varied with temperature and species identity. *H. submersus*, *L. curvula* and *V. elodeae* showed higher growth rates at 27°C, while the opposite was observed for *A. tetracladia*. Growth rates of fungal species in multicultures changed with temperature, species number and identity. Growth rates of *L. curvula* decreased in multicultures of 4 species at 13.5°C, but increased for *V. elodeae*. In the case of *A. tetracladia*, growth rates decreased in multicultures of 3 species at 27°C and no effects of species number was found for *H. submersus*. Overall, temperature changed interspecific relationships among fungi and this may have implications to plant detritus decomposition in streams under the predicted warming scenario.

The Portuguese Foundation for the Science and Technology supported this work (PTDC/CLI/67180/2006), I. Fernandes (SFRH/BD/42215/2007) and S. Duarte (SFRH/BPD/47574/2008).