



**XVII  
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## Environment, ecology and interactions

### **A study on the species diversity of Orbiliaceae in an oceanic archipelago (Canary Islands)**

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Within a few decades, the family Orbiliaceae Nannf. has undergone important changes. Being earlier placed in the Helotiales Nannf, the family was transferred in 2003 to a new order (Orbiliales Baral, O.E. Erikss., G. Marson & E. Weber) and a new class (Orbiliomycetes O.E. Erikss. & Baral). The major part of the species generally studied, have been reported in humid ecosystems (Liu et al. 2006, Zhang et al. 2009), but their diversity is more important in arid to semiarid ecosystems (Baral et al. ined.). The Macaronesian Region is characterized by its high biodiversity and endemism, and the Canary Islands play a key role within these regions (Médail & Quézel 1977, 1999). While Korf (1992) listed 8 species of Orbiliaceae, in the present research the family turned out one of the most diverse families in the Canary Islands (~ 60 spp). Until now, this group have been done in a taxonomical or descriptive way, but, what do we know about them from an ecological point of view? Tenerife is placed in the middle and it is the perfect place to test out how different climatic or biotic parameters influence the diversity of fungi. During three years, the two larger genera Hyalorbilia and Orbilia were monitored in four types of vegetation from sea-level up to the mountains. Here we show the changes in diversity and abundances of species in different levels of complexity: substrate, vegetation, altitude and slope.

## Environment, ecology and interactions

### **The effects of sodium hypochlorite on the control of inter-kingdom biofilm formation by drinking water-isolated microorganisms**

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Biofilms in drinking water distribution systems (DWDS) are responsible for several undesirable effects in water. One of the main drawbacks is their potential to protect pathogens from stress conditions. Microbial interactions in biofilms can benefit the survival of co-existing microorganisms, including the increased resistance to antimicrobials. Chlorine disinfection is the main widespread strategy used in DWDS for microbial control. Even if new and alternative strategies are being developed, it is conceivable that the future strategies still persist with chlorine due to economic and

safety aspects. Therefore, the understanding on the efficacy of chlorine against biofilms is of utmost importance in order to improve the current strategies. The purpose of this work was to assess the effects of sodium hypochlorite (SHC) on the control of single and dual-species biofilm formation by selected filamentous fungi (*Penicillium expansum* and *Penicillium brevicompactum*) and bacterium (*Acinetobacter calcoaceticus*) isolated from DWDS. Biofilms were developed during 48 h in 96-wells microtiter plates under two hydrodynamic conditions (25 and 150 rpm). The effects of SHC at several concentrations (0.1, 0.5, 1, 10 and 100 mg/L) was tested. The biofilm control was evaluated using crystal violet (removal) and resazurin (inactivation) dyes. The results shown that, *P.brevicompectum* biofilms were extremely resistant to disinfection when compared with single-species biofilms of *P.expansum* and dual-species biofilms of *P.brevicompectum*-*A.calcoaceticus*. The association of *A.calcoaceticus* with both fungi seems beneficial, since the dual-species biofilms were more resistant to disinfection. The inactivation and removal occurred for high SHC concentrations. However, total biofilm control was not achieved.

## Environment, ecology and interactions

### Comparison of chemical composition in *Tuber aestivum* Vittad. of different geographical origin

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Truffles are hypogeous and nutrition-rich edible fungi. The aim of this study was a comprehensive investigation of chemical composition of black summer truffle (*Tuber aestivum* Vittad.). We compared lipids, protein, saccharides, polyphenolics, flavonoids, total sterols, ergosterol, volatile flavor and aroma compounds content in fruitbodies of the fungus collected in three different geographical region, i.e. Poland, Slovakia and Italy. A comparison of the mentioned compounds is especially interesting due to environmental and climatic differences between Poland, Slovakia and Italy. It showed that fruitbodies of *T. aestivum* from Poland and Slovakia possessed similar content of proteins, total sterols, and saccharides. The fruiting bodies from Italy contained significantly larger amounts of investigated compounds. In turn, Polish specimens had higher content of lipids and polyphenolics than Slovak and Italian ones. We have found higher similarity of volatile compounds composition between Polish and Italian specimens than those of Polish and Slovak origin.