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Fungal biofilms are applicable to removal of pollutants in biofilters in nonsterile conditions but the bacterial effect is poorly known. Interactions between fungal and bacterial organisms were investigated in preformed or nascent biofilms and the enzyme activities and degradation capacity measured. Different effects of *Escherichia coli* and *Pseudomonas aeruginosa* on degradation of an anthraquinone dye by fungal biofilms colonizing polyurethane foam (PUF) in the presence of bacteria (104-106 CFU) at pH 4.5 and 6 were observed in a 10-day experiment: the former bacterium inhibited degradation whereas the latter not. Production of peroxidases but not of laccase was reduced; the bacteria could not remove the dye. The fungal biomass amount colonizing PUF was unaffected by bacteria, *E. coli* and *P. aeruginosa* increased their respective counts by 1 to 3 and 0 to 2 orders of magnitude. In contrast, the degradation capacity (85-95% decolorization rate at pH 5.5) of preformed 1-week-old fungal biofilms colonizing PUF or pinewood was not affected by the added 106 CFU of *E.coli* in a 4-week experiment. The fungal growth was reduced 1.4-fold and bacterial counts increased up to 2-fold compared to bacterial controls. The results demonstrate a significant resistance of preformed *I. lacteus* biofilms to bacterial stress which is important for practical application. The work was supported by the project IAAX00200901.