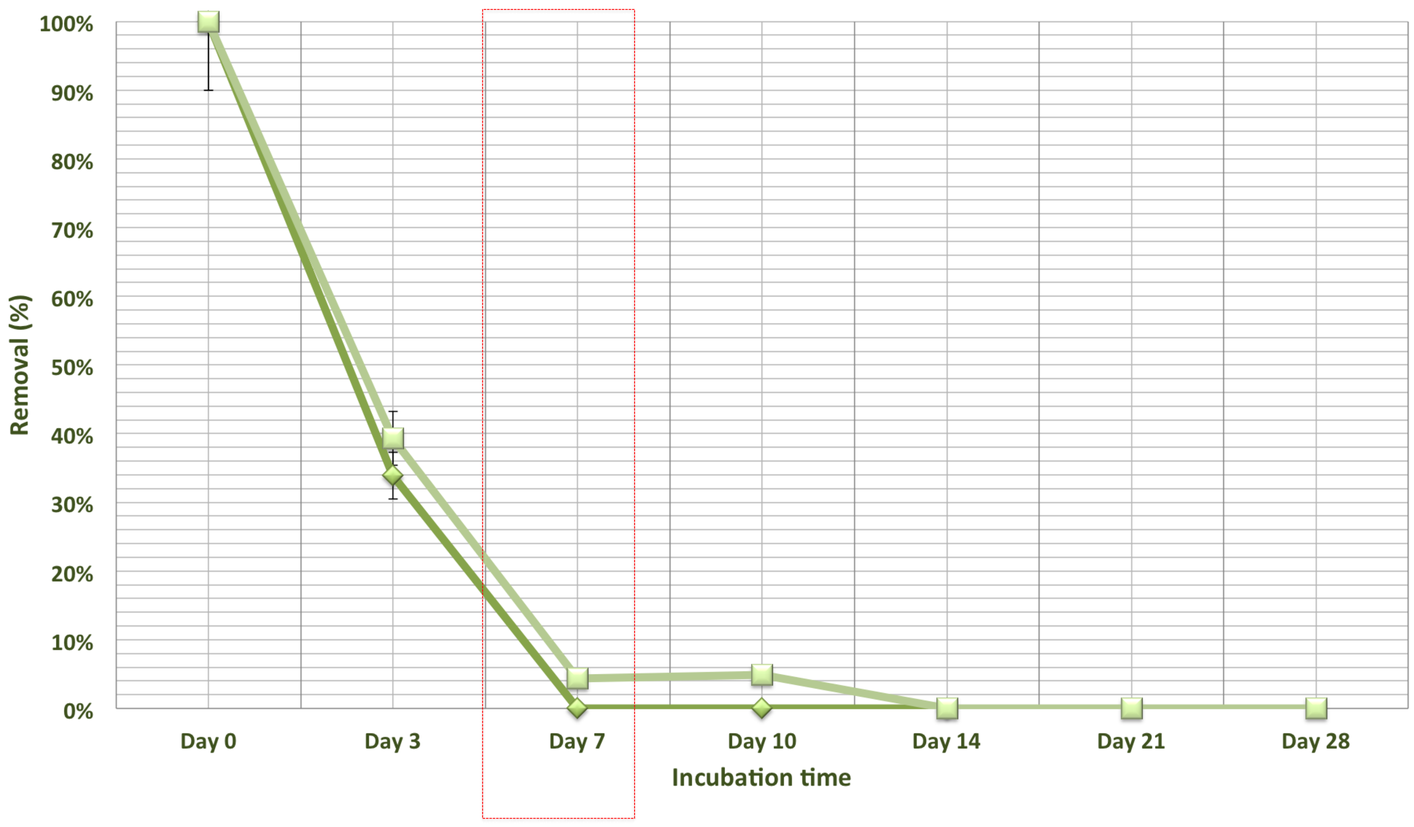
Fungi

In recent years, biological treatment with fungi has been pointed out as a promising technology due to the unspecific enzymatic system, which is able to degrade a wide range of hazardous substances even at very low concentrations.

The fungal wastewater treatment process offers several inherent merits, including higher degradation rates of complex organic compounds present in wastewater due to the presence of specific fungal enzymes, efficient solid separation of the fungal biomass from the mixed liquor, and the possibility to recover valuable fungal byproducts.

Application

During the Waterchain project, 6 different fungal strains were selected based on previous researchers. The simple screening of selected fungal strains was examined. Additionally, the effect of pH and nutrient supplements for fungal growth was investigated using real wastewater samples as a matrix. The finding of this research demonstrated that all fungal strains were able to grow in wastewater samples; however, morphological characteristics like form, elevation, and opacity were more optimal when the pH and macroelements were added to the wastewater. Further batch scale tests were performed using fungal approach to degrade the hazardous compounds such as diclofenac and ketoprofen. The several fungal strains have shown their ability to degrade the diclofenac more than >90% after 7-day incubation (see Fig. 1) while there is no reduction of ketoprofen.



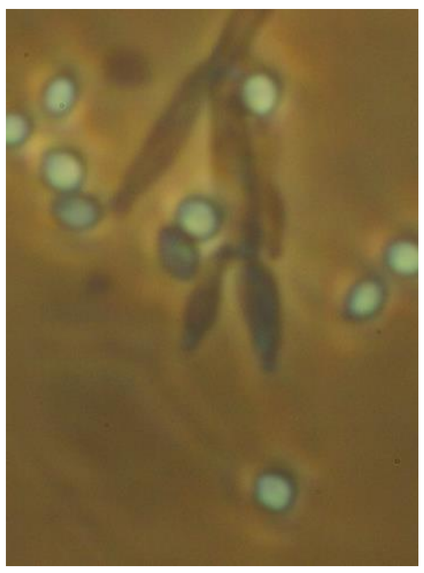


Figure 1. Comparison of diclofenac reduction (%) by two different fungal strains.

Sources:

1) Margot, J., Rossi, L., Barry, D.A., Holliger, C., 2015. A review of the fate of micropollutants in wastewater treatment plants. Wiley Interdiscip. Rev. Water 2, 457–487.
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3) Dalecka, B., Rajarao, G.K., Juhna, T., 2018.. Simple screening of fungal strains to determine potential application for the wastewater treatment process.

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