



BIOFUNGUS: WASTEWATER TREATMENT PLANT BASED ON A TWO-STEP FILAMENTOUS FUNGUS BIOLOGICAL PROCESS

Project ID: IDI-20191168



Project information:

Duration: starting: 01/06/2019 / Ends: 31/05/2022

Budget: 442.395,89 €

Funding: CDTI and FEDER contribution: 326.974,80 €

Coordinator and beneficiary: EM Aguas y Saneamiento de Murcia (EMUASA)

Collaborators: Universidad de Murcia y Centro Tecnológico del Medio Ambiente (CETENMA)



Description:

Biofungus Project has been developed at the Murcia Este WWTP. The Project aims the validation of an alternative biological process based on fungus to the conventional bacterial processes.

The conventional activated sludge processes require high oxygen demand. Besides, these bacterial processes are very sensitive to toxic discharges, reducing the quality of the WWTP effluents.

Wastewater treatment based on fungus presents several advantages:

Firstly, high COD consumption capacity and respond rate, and secondly, the robustness of this process against contaminants of emerging concern (CEC).

Last but not least, Biofungus promotes waste circularity, using food industry residues as part of the culture media for the fungus growth.

Project objectives:

- Seek of fungus strains able to assimilate nitrogen compounds, focused on nitrate and denitrification process.
- Design construction and optimization of a pilot plant based on this process.
- Validation of potential advantages of these organisms such as:
 - Rapid response times of the process, with high COD and nitrogen elimination rates.
 - Lower sludge production.
 - Evaluate the biomethane potential of the fungus sludge versus conventional WWTP sludge.
 - Evaluate contaminants of emerging concern (CEC) fungus resistance and degradation capacity.

Project outcomes:

- **Biofungus project has proved that fungus biological process is an alternative candidate for the conventional wastewater treatment.**
- **100% of ammonia and nitrate can be achieved with high elimination rates.**
- **Successful in-situ culture of two different strains of Mucor fungus.**
- **Lower sludge is produced by this process.**
- **Lab-tests have shown the high resistance of Mucor fungus to different contaminants.**
- **The robustness and resilience of the process was also proven in presence of contaminants.**