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Valorising waste from waste



A GICOM Group study highlights the importance of the valorisation of wastewater treatment residuals. The investigation suggests the biopesticide production from the digestate, the digestion waste from the treatment plants' first sludges.

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One of the pillars of technologically developed societies is the treatment of wastewater so that it can be reintroduced into the environment or, in more recent cases, reused, thus closing the water cycle.

In Catalonia, in recent decades, a great effort has been made to provide the entire population with wastewater treatment plants (WWTPs), which has led to a significant improvement in the environmental quality of rivers and coastlines.

Modern wastewater treatment plants operate using biological treatment systems, which means that, in addition to treated water, sludge that must be treated is produced. The most widely used system for this treatment is anaerobic digestion, which involves the production of biogas, used as a renewable energy source. At the same time, the digestion process produces new sludge, known as digestate, which could be considered "the waste of waste".



Taking all these aspects into account, it is clear that fully sustainable water management depends on the recovery of this digestate, which is currently used mainly as an organic amendment for agricultural fertilisation, where it competes with other materials such as slurry, manure or compost.

In the article published by the [GICOM Group](#) we explore an alternative use for this material. Specifically, we use digestate for the solid-state fermentation of the bacterium *Bacillus thuringiensis*, known for producing broad-spectrum biopesticides that replace chemical pesticides, whose production and application have known negative impacts on the environment. In the study, we focused on characterising the digestate produced in different Catalan wastewater treatment plants, using advanced analytical techniques, and on using it in the production of biopesticides on a pilot scale.



The results have been very satisfactory and have help us show that digestate is a good material for the production of biopesticides, which contributes to providing a new and more efficient way of recovering this material within the circular economy paradigm, resulting in a product with high added value.

These results have been obtained within the framework of the coordinated project FERTILAB (Ministerio de Ciencia e Innovación, PLEC2022-009252). Other research groups from the committee are testing the biopesticide properties of the material obtained in agronomic field trials.

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References

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