

## Poster

## Revaluation of tidal waste in wastewater treatment plants



López, Pilar \*(1,2), Greyer, Valeria (2) Rodríguez, Eva (1), Moral, Ana (2)

(1) Laboratorio UTE EDAR Ranilla, Barriada San José de Palmete, S/N, Sevilla

(2) Grupo ECOWAL, Ingeniería Química, Universidad Pablo de Olavide, Ctra. de Utrera, 1, 41013 Sevilla.

Tutor académico: Ana Moral

**Keywords:** flocculants; wastewater; sludge

### ABSTRACT

**Motivation:** The latest European legislation on the use of chemical products in wastewater treatment requires a reduction in their usage. Consequently, essential operations in this process, such as contaminant removal and sludge flocculation, require alternative solutions [1]. Although replacing the efficiency and cost-effectiveness of chemical flocculants is challenging, natural flocculants derived from plant residues and algae are proposed as a promising solution to reduce these polluting products while also valorizing waste, thus promoting a circular economy [2].

**Methods:** This study focuses on two approaches: phosphorus removal from wastewater and improved sludge flocculation. The optimal flocculant dose required for phosphorus reduction was determined using a jar test. Specifically, 500 mL of wastewater was used for each sample, and soluble phosphorus levels were measured before and after the procedure. The testing protocol for each chemical substitute was as follows [3]:

1. One minute of stirring at 80 rpm (revolutions per minute).
2. Fifteen minutes of stirring at 30 rpm.
3. Twenty minutes of settling.

For the sludge tests, the experiment was conducted manually using 100 mL of sludge.

**Results and conclusions:** The tests confirmed that natural flocculants effectively reduce contaminant levels. Similarly, they were observed to aid in sludge flocculation and decrease the amount of chemical flocculant required. Additionally, while the cationization of flocculants did not significantly affect sludge flocculation, it did enhance the removal of contaminants such as phosphorus.

However, further research in this area is necessary, as these natural alternatives are still far from achieving the cost-effectiveness and performance levels of traditional chemical flocculants.

### REFERENCES

- European Parliament. (2025). Chemicals and pesticides. Thematic dossiers on the European Union. Retrieved from <https://www.europarl.europa.eu/factsheets/en>
- Aguado, R., Lourenço, A. F., Ferreira, P. J., Moral, A., & Tijero, A. (2017). Cationic cellulosic derivatives as flocculants in papermaking. *Cellulose*, 24(7), 3015-3027.
- Universidad de Sonora. (n.d.). Technique for determining the optimal dose through the jar test [Technical document].