

# WETLANDS IN A MODULAR COMPACT SYSTEM FOR INDIVIDUAL SANITATION IN GALICIA

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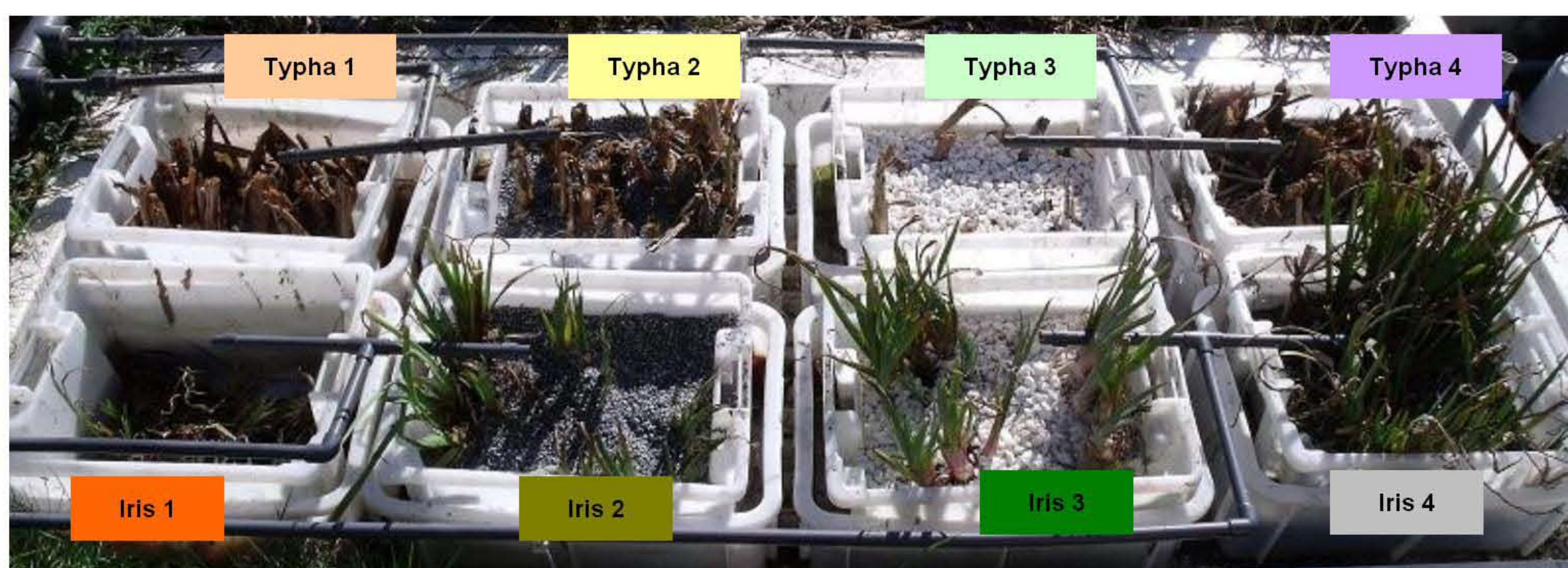
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## INTRODUCTION

Galicia is characterized by a highly dispersed population. About 21 % of the population lacks sanitation system, or this consist only in a septic tank with deficiencies in results and yields. A pilot plant has been constructed to treat the effluent coming from a household. This system is composed by a septic tank of 500 dm<sup>3</sup> and three subsurface flow constructed wetlands working in parallel of 3,3 m<sup>2</sup> each. First one of them, has on its surface with a compact modular system that's allows the combination of a horizontal and vertical flow system in a minimum surface equivalent per capita. The aim of this study is to see which configurations of modular system is the most efficient at removing contamination.

## MATERIAL AND METHODS

Eight modular systems were designed. Four of them were planted with *Iris pseudacorus* and the rest with *Typha sp.* Tray's configuration were two with free water (1), two with fine granular material (2), two thick material (3) and two fine old material (4). The latter was used in a previous experience.



## RESULTS AND DISCUSSION

Two experiments were performed, one with a retention time of 24 and another 60 hours. Figures show evolution efficiency of treatment in trays system during the experiences. The inflow is taken after septic tank, and the outflow in each modular system. Operation characteristics during this period was one day to application and two days dry period with a hydraulic load was 8,3 mm/d.

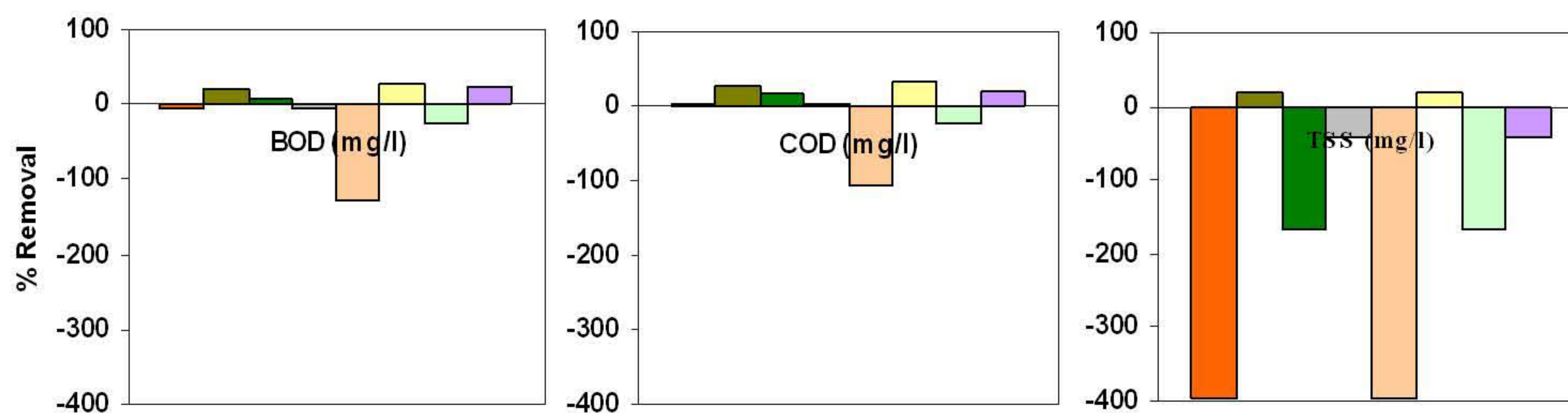
It has been observed that trays with retention time of more than 60 hours have higher removal rates, whereas lower retention times show negative rates.

Systems with *Iris pseudacorus* as vegetation are more efficient than those with *Typha sp.*, although evapotranspiration is higher in the latter.

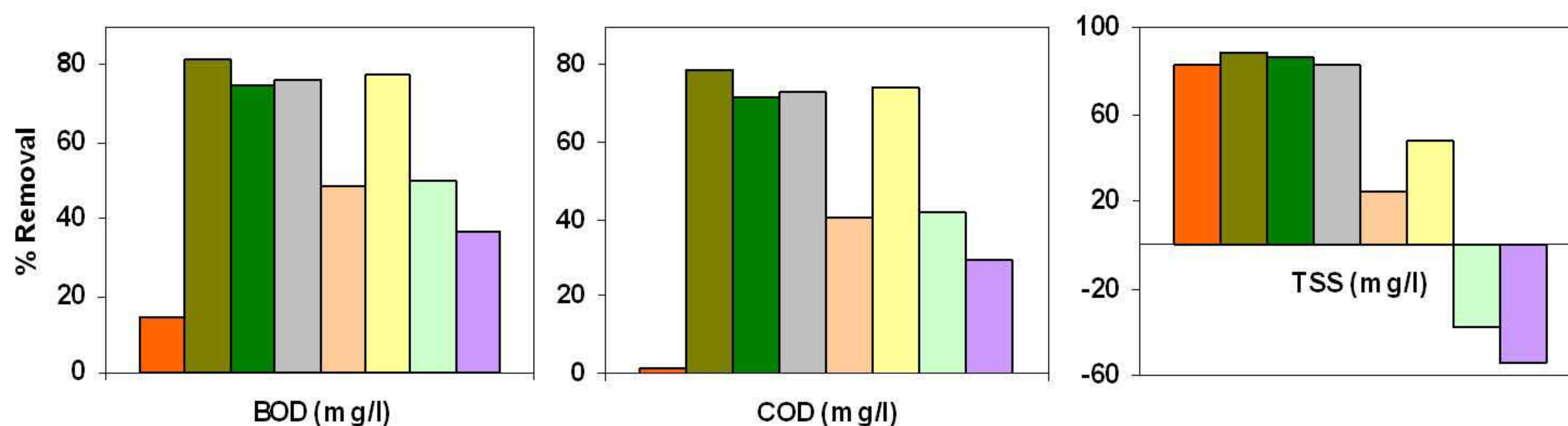
The modular compact systems filled with fine granular material (type 2) showed better removal rates for total suspended solids, chemical oxygen demand and biological oxygen demand.

These results have been used only as a first approach in order to know the best configuration of the compact modular systems.

Efficiency removal in compact modular system with a retention time of 24 hours



Efficiency removal in compact modular system with a retention time of 60 hours



## CONCLUSIONS

Results indicate that the best configuration has a fine granular material, *Iris pseudacorus* as vegetation and a retention time more than 60 hours. This configuration has a removal efficiencies of 88 %, 79 % and 82 %, for total suspended solids, chemical oxygen demand and biological oxygen demand, respectively.

## REFERENCES

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