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Abstract

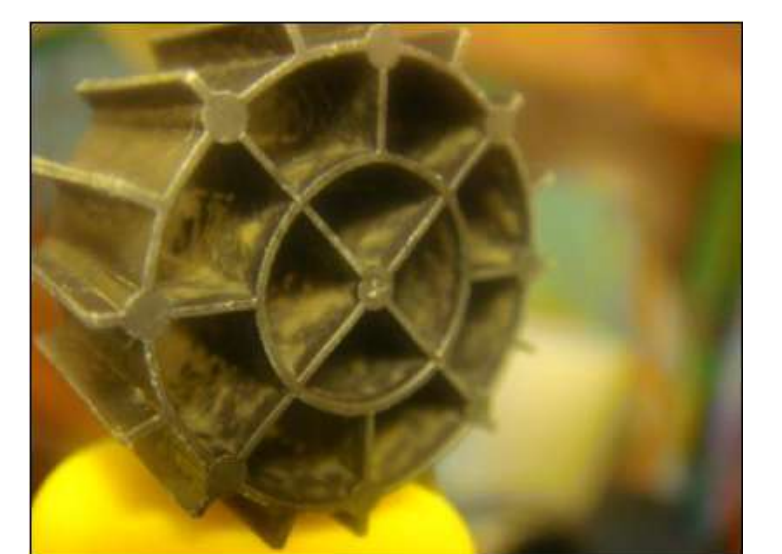
In this paper we present results obtained during the study of a wastewater treatment pilot plant that combines an Active Sludge Process (ASP) and a fixed bed system. This mixed system lead to extraordinary efficiencies even higher than those required by current legislation. Furthermore, the support material used in the experience has a suitable specific surface rate and size, improving the growth and attachment capacity of the biofilm.

Material and Methods



INFLUENT { COD, BOD₅
TSS, VSS
EFLUENT { pH, Conductivity
NTK, N-NO₂, N-NO₃

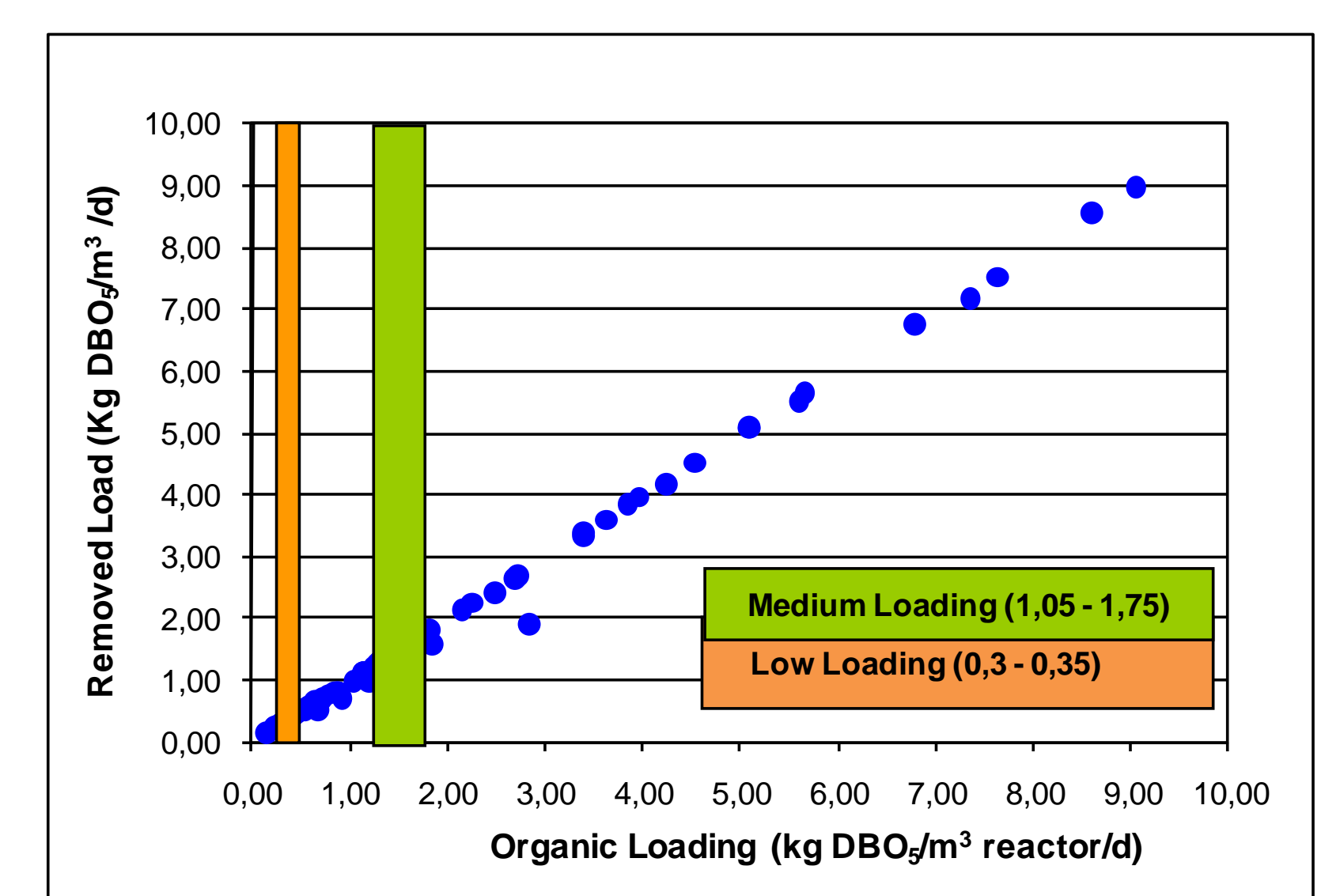
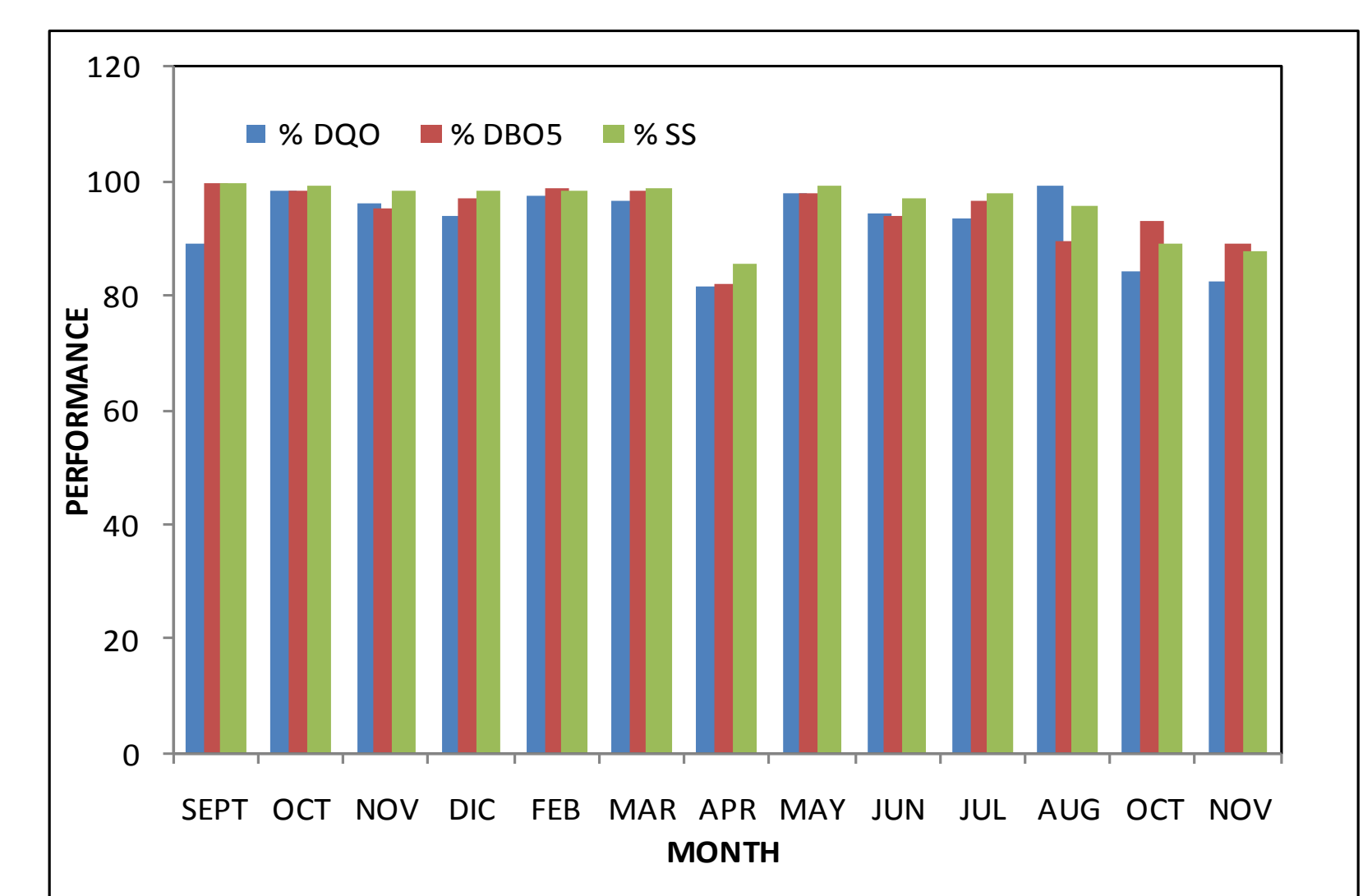
BIOLOGICAL REACTOR { VSS, T^a, O.D.
Microbial Activity



Results and Discussion

The pilot plant used in the study was operating continuously during a period of two years in the Wastewater Treatment Plant (WWTP) of Conil de la Frontera (Cádiz, Spain). At this time, the plant showed a performance that adequately accomplished the objectives of the study. It is worth noting the great variability of organic loads that entered the WWTP during the study period. However, the global efficiency reached by the pilot plant was adequate and fairly constant throughout the duration of the trial.

The large dispersion observed in the data of certain parameters measured in the raw wastewater at the entrance of the plant, as well as the high average organic load are consequences of two key factors: High seasonal population variability in the region and large variations of organic loads due to punctual dumping of fecal water to the WWTP in Conil de la Frontera.



Conclusions

- Purification yields achieved in the system tested are very high, even higher than those required by legislation in force, in spite of the high organic loads.
- This system also presents a great capacity for adaptation and recovery facing flow and organic load variability.
- Bioreactors were able to support volumetric loads much higher than those typically accepted for exclusive ASP.
- The secondary clarifiers were able to work with ascensional velocity rates higher than those in conventional ASP units.
- Maximum volumetric load was not reached by neither of both plants, because, due to the "special" raw wastewater characteristics, maximum flow limit was reached before achieving maximum accepted organic load.
- The use of this technology in current WTP's with activated sludges will allow to the biofilm system to be used in a combined way. This will increase depuration efficiency and treatment capacity using existing reactors without anyone more.

Acknowledgements

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