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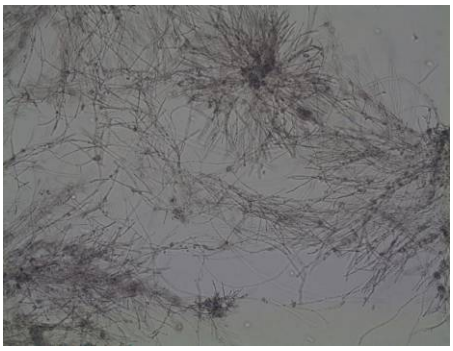
Comparison of biocenoses from Sequencing Batch and Sequencing Biofilm Batch Reactors

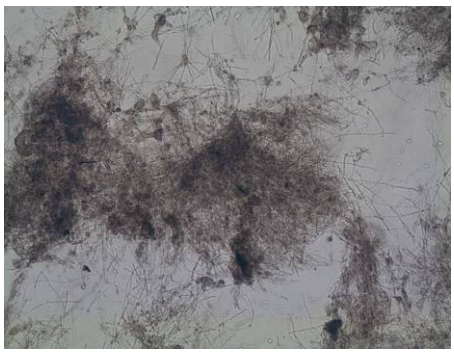
M. Matos*, R. Costa, R. Pinto, A.G. Brito, R. Nogueira
IBB – Institute for Biotechnology and Bioengineering, Portugal, Portugal

Since the extensive research during the 70s, sequencing batch reactors (SBR) have become a quite common modification of activated sludge process. Additionally, the SBR can be combined with biofilm growth on the surface of a support material originating the Sequencing Batch Biofilm Reactors (SBBR). While several comparative studies between the two systems were done in terms of organic carbon and nutrients removal efficiency, a detailed comparison of their biocenoses is not documented in the literature.

The present work aims to compare the biocenoses from SBR and SBBR. In order to reach this objective four reactors were operated in parallel. One reactor was operated just with suspended biomass (SBR1) while the others combined suspended biomass with biofilm cultivation. The biofilm was formed on a new type of polyethylene support developed by University of Minho, called *DupUM*. The bed formed by these supports occupied 5 % (SBBR2), 10 % (SBBR3) and 20 % (SBBR4) of the reactor volume.

Microscopic inspection revealed that the quality of biocenoses from reactors started to differ very soon after the inoculation. The biocenose of SBR1 and SBBR2 was dominated by filamentous microorganisms, while in SBBR3 and SBBR4 the communities were clearly more complex. The incorporation of an optimized amount of support for biofilm growth apparently suppressed the overgrowth of filamentous microorganisms. The differences between the biocenoses of the reactors are documented in figure 1.





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