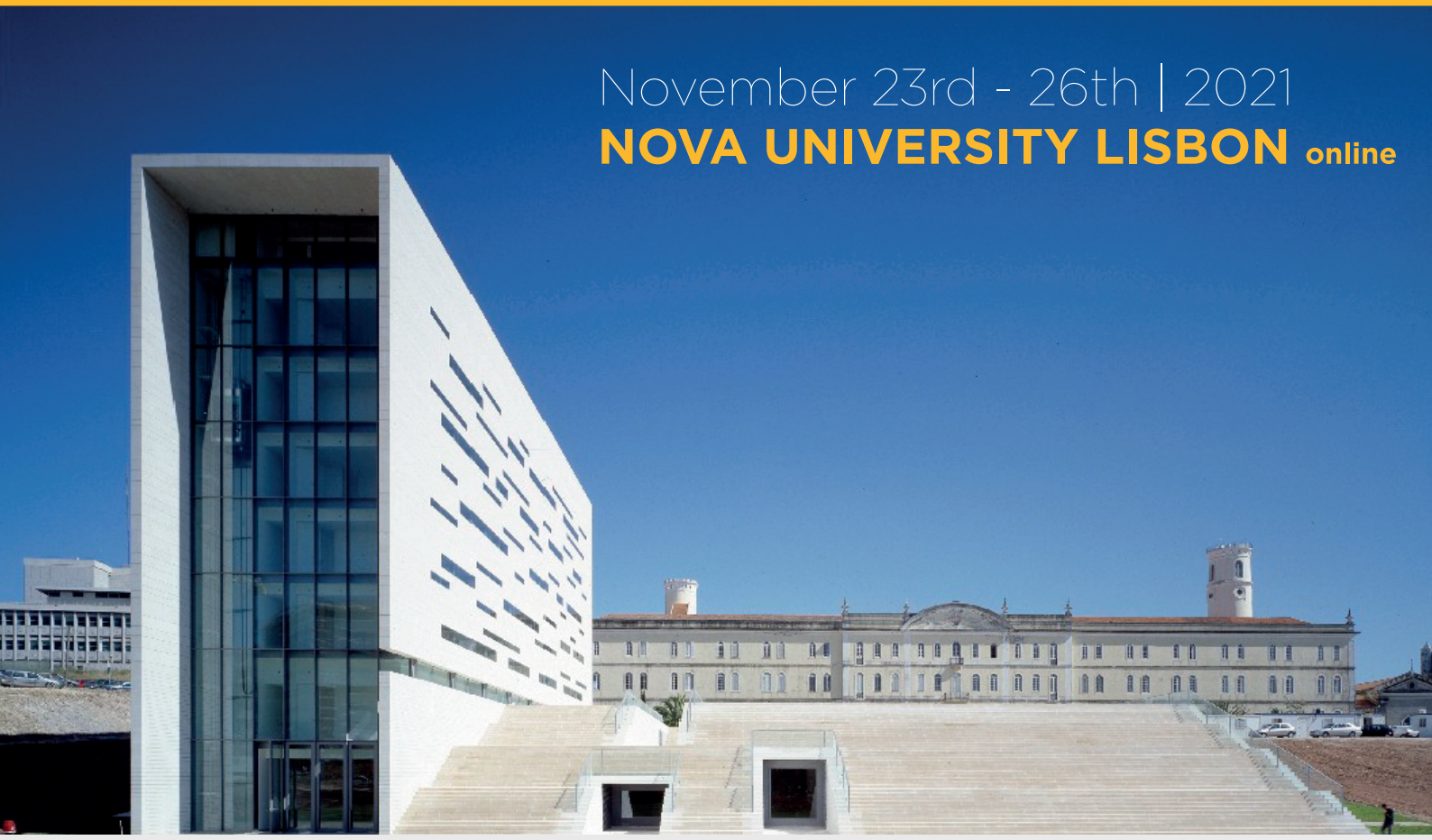
MICRO BIOTEC 21

Webconference

CONGRESS OF **MICROBIOLOGY** AND **BIOTECHNOLOGY 2021**



Abstracts Book

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O.366. Efficient ammonium removal from marine aquaculture wastewater with microalgal-bacterial granular sludge technology

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Water recirculation in marine aquaculture is fundamental for the protection of water resources and for the sector sustainability as it enables to reduce water usage [1]. Microalgal-bacterial granular sludge (MBGS) has the potential to increase the removal efficiency of pollutants from wastewaters benefiting from the diverse metabolism allowing water recirculation. Moreover, MBGS would allow costs reduction both in biomass separation from the treated water given the rapid settling properties and in aeration due to microalgae oxygen production [2].

This study aimed to develop MBGS able to treat marine aquaculture effluents. For that, a lab-scale photo sequencing batch reactor was inoculated with activated sludge, previously adapted to salty wastewater, and a microalgae consortium enriched from water collected at a marine aquaculture. Feeding composition was established to simulate marine aquaculture streams.

The aggregation of microalgal and bacterial biomass to form granular structures occurred rapidly. Throughout the operation, dark green granules with a dense and compact structure became predominant together with an increase in chlorophyll and carotenoids content in biomass. Ammonia was absent from the reactor effluent, but the nitrite levels were often above the toxicity levels for fish. Nevertheless, the dissolved oxygen concentration in the treated water was high (> 8.63 mg/L).

The microalgal-bacterial granules proved to be efficient in producing streams with high dissolved oxygen levels, lowering the needed of water oxygenation before reuse and without ammonium ions. However, for water recirculation, improvement of the nitrite removal is needed to maintain the levels below the fish toxicity levels.

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