POSTER AND SELECTED SHORT TALKS

1 - Environmental Microbiology and Biotechnology

P1 1
Contrasting effect of diet shift on the gut microbiota of two amphoipods species *Orchestia montagui* and *Talitrus saltator*

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Talitrid amphipods are among the most important detritivorous living in the supralittoral environment of sandy beaches. We have previously reported that different talitrid species may host different gut bacterial communities. However, it is unclear if such differences arose because of some species-specific physiological features of host or/and in relation to possibly different foraging behavior. Consequently, we wanted to investigate the resilience of gut bacterial communities of talitrid amphipods, to shed some light on the effect that different alimentary sources feeding habits may have on species-specific gut microbiota patterns. We choose as model two species with contrasting food preferences and gut microbiota, *Talitrus saltator* (Montagu) and *Orchestia montagui* (Audouin) and challenged them with artificial food for two months to evaluate the resilience and the effect of dietary changes over the gut microbiota. Results, obtained by 16S rRNA gene metagenomics and analysis of cellulase-encoding genes, along five time points samples: natural habitats(T 0), after 24hours (T 1), after 7 days (T 2), after 23day (T 3) and after 1 day (T 4) showed a contrasting behavior of gut microbiota dynamics in the two talitrid amphipod species with *T. saltator* being more affected than *O. montagui* in terms of diversity of the microbiota. Concerning the taxonomic profiles, in *O. montagui* members of the class *Bacilli* resulted the most variable over time, while in *T. saltator* most of the variability was due to *Enterobacteriaceae*. Finally, cellulose-encoding genes (GHF48 family) were strongly increased in their abundance in *O. montagui* gut microbiota compared to *T. saltator*, mirroring the increase of Actinobacteria over time. In conclusion, we provide evidences that changes in food sources (in natural environments related to the availability of stranded organic material) may have a contrasting impact over the gut microbiota of different talitrid amphipod species, which could determine mid- or long-term changes in animal's physiology and on species' fitness in the environment.

P1.2
Lactobacillus gasseri SF1183 protects the intestinal epithelium and prevents colitis symptoms *in vivo*

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Lactobacillus gasseri strain SF1183 belongs to a subpopulation of human intestinal bacteria tightly associated to the ileal epithelium (1). It produces antimicrobials and forms biofilm in simulated intestinal fluid after exposure to gastric conditions (1). *In vitro* studies with human intestinal cells indicated that SF1183 secretes molecule(s) able to drastically interfere with the cell cycle (2). The human intestinal origin, the ability to survive gastric conditions and have metabolic activities in intestinal conditions and the *in vitro* results induced us to hypothesize an *in vivo* role of *L. gasseri* SF1183. To test this hypothesis we used a murine system of DSS-induced colitis and analyzed whether the oral administration of SF1183 cells had an anti-inflammatory, protective, role. Mice treated with SF1183 showed a strong reduction of the inflammation most likely due to the amelioration of the tight-junction assembly. Our results point to a role of SF1183 cells in protecting the epithelial barrier integrity and contributing to the reconstitution of the tissutal homeostasis.

1. Fakry et al. Res Microbiol. 160:817-823 (2009)
2. Di Luccia et al., PLoS ONE 8(7): e69102 (2013)

P1.3
Identification of FDA-approved compounds targeting the *pqs* quorum sensing system of *Pseudomonas aeruginosa*

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Hampering bacterial adaptability to the host environment is considered a promising strategy for the eradication of infections caused by drug-resistant pathogens. Quorum sensing (QS), a communication system that controls virulence factors production and biofilm formation in several pathogens, is an ideal target for the development of anti-virulence drugs. Here we describe the identification of new inhibitors of the *pqs* QS system of *Pseudomonas aeruginosa*, relying on 2-alkyl-4-quinolones (AQs) as signal molecules. Briefly, a reporter system based on the co-culture of *P. aeruginosa* PAO1 and of an AQs-biosensor, in which light emission depends on AQs produced by the PAO1 strain, has been used for the screening of a library of 1,600 FDA-approved drugs. Three hits specifically inhibit the *pqs* QS systems, and hence the expression of *pqs*-controlled virulence traits in *P aeruginosa*. Preliminary analyses suggest that the newly identified inhibitors hamper the *pqs* system by targeting the transcriptional regulator PqsR. Further analyses proving the ability of the *pqs*-inhibitors to reduce *P aeruginosa* pathogenicity in animal models of infection are in course.

P1.4
Fungal treatment for recalcitrant compounds removal In raw leachate and synthetic mixtures

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Recalcitrant compounds represent a serious concern in wastewater treatment since biological processes, based on bacterial degradation, are not suitable for their removal. Recently, the capability of white-rot fungi (WRF) in transforming recalcitrant pollutants generated a significant interest among bio-based industries. This study focused on the treatment of 3 effluents with the white-rot fungus *Bjerkandera adusta* MUT 2295 in batch tests. *B. adusta* MUT 2295 was selected during a previous experiment due to its ability to act towards a raw leachate sample (Italy). Treatment efficiency of *B. adusta* was evaluated on a) landfill leachate (Canada) and b) two synthetic recalcitrant solutions prepared with 1) tannic and 2) humic acid. Different parameters such as the pH of the treated effluent, its chemical oxygen demand (COD) enzymatic activities and glucose consumption of *B. adusta* during the treatment were monitored for 10 days. COD removal was up to 49%, 61% and 49% in in raw leachate and the two synthetic solutions. Moreover, color removal between 25% and 49% was achieved in 1 week. Results obtained encourage further investigations on the use of the selected white-rot fungus.