P1476

Abstract (poster session)

From market to fork: rainbow trout contain Enterococcus with virulence factors, antibiotic- and biocide-resistance genes

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Objectives: We previously determined (22nd ECCMID; O-302) the occurrence of multidrug resistant (MDR) and virulent Enterococcus in water/sediment/feed collected in aquacultures producing rainbow trouts (Oncorhynchus mykiss). Portuguese marketed trouts for human consumption are mostly of aquaculture origin, but studies showing their contribution to the human spread of potential clinical relevant bacteria through the food chain are unavailable. Our goal was to study the occurrence of Enterococcus carrying virulence and antibiotic (AB)/biocide resistance genes in rainbow trouts marketed in Portugal. Methods: Trout samples of aquaculture origin (n=27; 3 trouts/sample; muscle and viscera) were collected from 8 supermarkets (n=25) and an aquaculture facility (n=2) (May-July 2012). Samples were enriched in peptone water (1:10) and plated in Slanetz-Bartley agar with/without antibiotics. Species identification and search of genes coding for ABR (vanA, vanB, vanC; tetM, tetL, tetS, tetK, tetO; ermA, ermB, ermC; aadE), copper (3 multicopper oxidases, 2 copper export ATPases), mercury (4 merA sequences) and virulence (esp, hyl, acm, gel, asa) were done by PCR. Susceptibility to 13 AB was tested by disk diffusion (CLSI). Results: Enterococcus were detected in 81% of the samples corresponding to 7 supermarkets and one aquaculture (27 E. faecium-Efm, 9 E. faecalis-Efl, 17 E. durans, 2 E. hirae, 6 Enterococcus spp). They were resistant to tetracycline [43%; tet(M)-92%, tet(L)-35%, tet(S)-12%], erythromycin [20%; erm(B)-83%], chloramphenicol (7%), HLR-streptomycin (5%; aadE-100%), ciprofloxacin (8%), trimethoprim-2% or nitrofurantoin (3%). Multidrug resistance was detected in 7% of the isolates. Genes encoding for copper (tcrB-5%, cueO-11%) and mercury (merA1-2%; merA2-2%; merA3-7%) resistance were detected only in Efm and those coding for virulence in different species (gel-13%, Efl; asa-3%, Efl; acm-39%, Efm). AB and copper or mercury resistance genes were co-detected in 11% and 7% of the isolates, respectively. Conclusions: Market trouts are vehicles of Enterococcus spp carrying virulence (e.g. associated with adhesion), AB and biocide resistance, which can colonize human after ingestion. These genetic determinants were previously found in aquaculture environmental samples suggesting a contamination of the animals in the production setting and the possible selection of these strains by different compounds.