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Fungal and mycotoxigenic burden from feed applied in Portuguese aquaculture

Carla Viegas^{1,2*}, Liliana Esteves¹, Tiago Faria^{1,3}, Ana Pombo⁴, Liliana Aranha Caetano^{1,5}, Anita Quintal-Gomes^{1,6}, Magdalena Twarużek⁷, Robert Kosicki⁷, Jan Grajewski⁷, Susana Viegas^{1,2}

¹Environment and Health Research Group – Lisbon School of Health Technology, Lisbon, Portugal (ESTeSL/IPL), ²Centro de Investigação em Saúde Pública, Escola Nacional de Saúde Pública, Universidade NOVA de Lisboa; ³Centro de Ciências e Tecnologias Nucleares, Instituto Superior Técnico, Universidade de Lisboa; ⁴Marine and Environmental Sciences Centre (MARE), ESTM, Polytechnic Institute of Leiria, 2520-641 Peniche, Portugal; ⁵Research Institute for Medicines (iMed.Ulisboa), Faculty of Pharmacy, University of Lisbon, Lisbon, Portugal; ⁶University of Lisbon - Institute of Molecular Medicine, Faculty of Medicine, Lisbon, Portugal; ⁷Kazimierz Wielki University, Faculty of Natural Sciences, Institute of Experimental Biology, Department of Physiology and Toxicology, Bydgoszcz, Poland

* Corresponding author: carla.viegas@estesl.ipl.pt

Aquaculture is one of the most important animal husbandry systems, allowing a regular growth of 1% per year in the last three decades worldwide. As in other animal production, feed safety is an essential factor to assure the productivity of those aquatic activities.

The aim of this study was to assess fungal and mycotoxigenic burden in 7 different feeds, 4 filters from aquaculture recirculation tanks and 7 water samples from the same tanks. Each sample suspension was inoculated on to 2% malt extract agar (MEA) with 0.05 g.L⁻¹ chloramphenicol media and dichloran glycerol (DG18) agar-based media. After incubation of the MEA and DG18 plates at 27 °C for 5 to 7 days, fungal densities (colony-forming units, CFU/m²/g) were determined and morphological identification was achieved through macro and microscopic characteristics. Molecular detection of the toxigenic *Aspergillus* sections Flavi, Fumigati, Circumdati and Versicolores will be performed shortly. Thirty seven mycotoxins were analyzed using LC-MS/MS system and detection was carried out using high performance liquid chromatograph (HPLC) Nexera (Shimadzu) with a mass detector API 4000 (Sciex). *Fusarium verticilloides* was the most prevalent in all samples analyzed, being detected on 3 out of 7 (42.6%) feed samples. *Fusarium culmorum* was also identified in one of the 3 feed samples. Besides *Fusarium* genus also *Aureobasidium* and *Penicillium* were found in one and in two water samples, respectively. The mycotoxins detected were deoxynivalenol, zearalenone, fumonisin B1, fumonisin B2, T2, ochratoxin A and mycophenolic acid. Most of the mycotoxins were detected only in the dry feed samples and only mycophenolic acid was found in one sample of semi-moist feed. Thus, the two samples of dry feed presented contamination by 6 to 7 mycotoxins.

In light of the results obtained from this first screening about fungal and mycotoxigenic burden in Portuguese Aquaculture, further studies should be performed focusing on raw materials and dry feed samples. Molecular detection of fungal species should target, besides *Aspergillus* genera, also *Fusarium* specific species.