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FUNGAL GROWTH AND MYCOTOXIN PRODUCTION IN A NEW FORMULATED MEAT PRODUCT WITH STRUCTURED EMULSIONS AS SUBSTITUTES FOR PORK RIGID FAT

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One of the major changes in dietary habits of the last half-century has been the increase of meat-based products consumption. This increase has contributed to a diet rich in saturated fats, which can result in adverse health effects. A recent trend in food industry is the development of new meat products based on traditional ones, though having less saturated fats and adding healthy ingredients. In this work, the growth and mycotoxin production of three mycotoxigenic species that colonize meat products was evaluated in a new formulation of cured salami, where rigid pork fat was replaced by O/W structured emulsions based on sunflower oil. Together with the traditional formulation (TS), two degrees of rigid pork fat substitution were analysed, 50% (SF1) and total substitution (SF2). To evaluate fungal and mycotoxins contamination, salami produced in industrial environment were grinded and mixed with agar. This medium was inoculated with the toxigenic species *Aspergillus nomius*, *Aspergillus westerdijkiae* and *Penicillium nordicum.* At the end of the incubation period, fungal growth did not show significant differences between the three analysed samples for *A. nomius*; for *P. nordicum*, results show a variation of approximately ±10% of SF1 and SF2 in relation to TS; as for *A. westerdijkiae*, SF1 and SF2 showed growth inhibitions up to 20% and 40%, respectively, when compared with TS samples. Despite fungal growth not being affected in the different, mycotoxin analysis revealed an almost complete inhibition of aflatoxin production by *A. nomius* in the SF2 medium and up to 90% for SF1, when compared with

traditional salami. OTA production by *P. nordicum* was hindered by 15 to 30% for SF2 and up to 20% for SF1; and *A. westerdijkiae* OTA production was reduced by approximately 15%, in SF2 medium and up to 10% for SF1 medium, when comparing with traditional salami. Fatty acid profile shows a reduction of total fat of approximately 30% for SF1 and 60% for SF2, when compared with the traditional salami. More expressive differences are observed in palmitic, stearic, and oleic acid, where concentrations drop to half in SF2 samples. It is hypothesized that reduction of these fatty acids may be related to the reduced levels of mycotoxins, specially, in SF2 samples. Further studies are being developed to determine the factors responsible for mycotoxin inhibition in these new formulations. **Acknowledgements**. Study supported by the Portuguese Foundation for Science and Technology (grant UIDB/04469/2020) and by project BetterFat4Meat (POCI-01-0247-FEDER-039718).

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THE ABILITY OF CYCLOPIAZONIC ACID PRODUCTION EXPRESSED BY SURFACE MOULDS ISOLATED FROM DRY CURED MEAT PRODUCTS

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Cyclopiazonic acid (CPA) is an under-investigated mycotoxin of toxicological significance, produced by several *Penicillium* spp. (*P. griseofulvum*, *P. camemberti*, *P. dipodomyicola* and *P. commune)* and *Aspergillus* spp. (*A. flavus*, *A. oryzae* and *A. tamarii)* species. Moulds of the *Penicillium* and the *Aspergillus* genus overgrow the surface of dry cured meat products during ripening. Although *P. commune* is one of the predominant mould species isolated from dry cured meat products, CPA concentrations in products of this type are generally unexplored. The ability of moulds to produce mycotoxins is affected by various environmental and biological factors, such as the presence and expression of biosynthetic genes. In this study, 200 samples of Croatian traditional dry cured meat products were analysed for the presence of CPA-producing moulds. Surface moulds were identified using both the traditional and the molecular method, the latter employing β-tubulin and calmodulin loci sequencing. The isolates of mould species that can produce CPA were tested for the presence of *dmaT* gene encoding dimethylallyl tryptophan synthase involved in CPA production using real-time PCR. CPA concentrations in dry cured meat products were analysed using LC-MS/MS (liquid chromatography-tandem mass spectrometry). Species identified from the surface of TMP samples, potentially able to produce CPA, were *P. commune* (70 isolates), *A. flavus* (12 isolates), and *P. polonicum* (13 isolates). Several studies have indicated the need for testing the CPA production potential of *P. polonicum* as well. The results revealed the presence of *dmaT* gene in 17% of *A. flavus*, 64% of *P. commune*, and none of *P. polonicum* isolates. In 24 samples, the CPA concentrations were above the limit of detection (LOD = 2.17 µg/kg) and increased to 66.35 µg/kg. *P. commune* comprising *dmaT* gene was identified in roughly half of the CPA positives (11 out of 24), while *A. flavus* was not identified in any of CPA-contaminated samples. It can be concluded that *P. commune* commonly possesses the CPA biosynthetic gene and therefore represents a potential public health hazard. CPA contamination of samples in which *P. commune* or other CPA producers were not identified can either be explained by the previous contamination of meat product ingredients, or by the possibility that *P. commune* (or other CPA producers) were overgrown by other mould species at the end of the ripening stage and therefore skipped detection.

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ANTIFUNGAL ACTIVITY OF LEMON PEEL MEDIUM FERMENTED BY LACTIC ACID BACTERIA ISOLATED FROM CITRUS FRUITS AND METABOLOMIC PROFILE OF CITRUS CONTAMINATING MYCOTOXIGENIC FUNGI

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The important productive activity of the juice sector generates huge amounts of waste materials every year, such as peels, membranes, and seeds, representing citrus peel waste alone almost 50% of the wet fruit mass. Fungal rots are the leading cause of postharvest losses (about 30%) of citrus and can greatly reduce its shelf life. Some postharvest fungal pathogens of citrus fruits produce mycotoxins that can diffuse through the peel and be found in juices. The aims of this study were to re-evaluate lemon peel waste to develop a fermented product by isolated bacteria from citrus fruits with antifungal activity, explored their antagonistic properties against the main mycotoxigenic pathogens of citrus fruits,