

Aflatoxins and ochratoxin A contamination during Merkén Pepper Powder Production in Chile

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Costa J.¹, Carla Santos^{2,3}, Soares C.^{2,3}, Lima N.^{2,3}, Santos C.⁴

¹Departamento de Biología, Instituto de Ciencias Biológicas-ICB, Universidad Federal do Amazonas,

²CEB-Centre of Biological Engineering, Campus de Gualtar, Micoteca da Universidade do Minho (MUM),

³LABELLS (Associate Laboratory, Braga/Guimarães), Campus de Gualtar, University of Minho,

⁴Department of Chemical Science and Natural Resources, Universidad de La Frontera

Berry fruits of *Capsicum annuum* L. cv. "Cacho de Cabra" are used for the manufacture of a traditional pepper powder known as Merkén, which is a Chilean spicy widely consumed at national level in Chile and also exported to different countries. Merkén contamination with Aflatoxins (AFs) and Ochratoxin A (OTA) is a main concern for local producers and national and worldwide consumers. In the present study, AFs and OTA contamination in berry fruits of *C. annuum* L. cv. "Cacho de Cabra" was determined at (1) harvest, (2) dried and (3) smoked stages of Merkén production, in (4) cumin and coriander seeds, used as Merkén ingredients, and in (5) the final packed Merkén produced by local farmers. In addition, Merkén obtained from local markets in the Region of La Araucanía (Chile), where obtained and evaluated. Aflatoxigenic and ochratoxigenic potential of fungal strains isolated from the above-mentioned substrates were also assessed. There was no detection of AFs nor OTA on pepper pods and seeds used as Merkén ingredients. In contrast, co-occurrence of aflatoxin B1 (AFB1) and OTA were detected in c.a. 57% of final packed Merkén samples (12 out of 21 samples). Regarding AFB1, Merkén samples produced by local farmers presented contamination level from 0.19±0.26 to 1.44±0.10 µg/kg; while Merkén sample purchased from local markets presented contamination level from 0.29±0.37 to 1.67±0.32 µg/kg. For these samples, no AFB2, AFG1, and AFG2 were detected. Ochratoxin A contamination was detected for 100% of Merkén samples from both local producers (0.79±0.05 to 5.99±0.68 µg/kg) and local markets (0.83±0.83-19.81±0.70 µg/kg). There was no detection of AFs and OTA on Petri plate for *Aspergillus* (n=52) and *Penicillium* (n=129) strains isolated from pepper pods, cumin and coriander seeds and Merkén. The lack of high AFs/OTA-producer among the isolated fungal species can explain and support the absence of contamination in pepper pods. In Merkén production chain the harvest and primary processing of post-harvest (dried and smoking of pepper pods) is a key point to fungal grow but are not critical for AFs and OTA production. In contrast, the second phase of post-harvest (milling, storage) are critical points for AFs and OTA contamination. Prolonged storage under poor hygienic conditions, oscillation in the water activity, and temperature can provide suitable conditions for mycotoxins production. In addition, NaCl and capsaicinoids compounds present on pepper pods and Merkén can act as intrinsic factor up-/downregulation AFs and OTA biosynthesis in this type of substrate.