Toxigenic penicillia spoiling frozen chicken nuggets

Frozen chicken nuggets are classified as pre-prepared frozen meals. These products are convenient to consumers as they are easy to prepare and allow for long storage by freezing. Over the years, spoilage of frozen food products caused by fungi has been a continual problem for the food industry since mold can develop when frozen foods are allowed to attain temperatures of -10ºC, or above. The growth of fungi on the food surface results in economic losses and represents a hazard to public health due to the possibility of mycotoxin production. The aim of this study was to identify the species of filamentous fungi involved in the spoilage of frozen chicken nuggets and determine their ability to produce mycotoxins under laboratorial conditions. A total of 7 samples of frozen chicken nuggets were analyzed by dilution plating in potato dextrose agar (PDA). These products had been returned by customers due to visible mold growth on their surface. The predominant species found were Penicillium glabrum, Penicillium polonicum, Penicillium manginii, Penicillium crustosum, Penicillium commune, and Penicillium solitum. Analysis of the profile of secondary metabolites was carried out in HPLC after growing the isolates in Czapek yeast autolysate agar (CYA) and yeast extract agar and sucrose (YESA) and extracting the extrolites with a solution of ethyl acetate, dichloromethane, methanol, and formic acid. Some isolates of these species showed an ability to synthesize mycotoxins such as cyclopiazonic acid, citreoviridin, roquefortine C, penitrem A, and verrucosidin under standard conditions. Considering the occurrence of fungal spoilage in frozen food and the potential hazard involved, more studies on psychrophilic fungi growth in foods stored at low temperatures are necessary. (C) 2014 Elsevier Ltd. All rights reserved.
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