

Food preparation with mucoralean fungi: A potential biosafety issue?

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Abstract

Mucorales have been used for production of fermented food in Asia and Africa since time immemorial. Particularly *Rhizopus* species are rapidly growing, active producers of lipases and proteases and occur naturally during the first stages of soybean fermentation. Two biosafety issues have been raised in recent literature: (1) pathogenicity, *Rhizopus* species being prevalent opportunists causing erosive infections in severely compromised patients, and (2) toxicity, strains harbouring endosymbiotic *Burkholderia* producing toxic secondary metabolites. At the molecular level, based on different gene markers, species identity was found between strains used for food processing and clinical strains. In this study, we screened for bacterial symbionts in 64 *Rhizopus* strains by light microscopy, 16S rRNA sequencing, and HPLC. Seven strains (11 %) carried bacteria identified as *Burkholderia rhizoxinica* and *Burkholderia endofungorum*, and an unknown *Burkholderia* species. The *Burkholderia* isolates proved to be able to produce toxic rhizoxins. Strains with endosymbionts originated from food, soil, and a clinical source, and thus their presence could not be linked to particular habitats. The presence of *Burkholderia* in *Rhizopus*

producing toxins could not be excluded as a potential risk for human health. In contrast, given the type of diseases caused by *Rhizopus* species, we regard the practical risk of infection via the food industry as negligible.

Beteiligte Forschungseinheiten

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