

Internship proposal for RISE:

Antimycotoxigenic potential of nanoencapsulated polyphenols from tropical fruits

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Project outline

Mycotoxins are secondary metabolites produced by fungi that can contaminate agricultural products in the field, during harvest or at storage sites. The contamination of feed and food with mycotoxins constitute a problem worldwide due to their high incidence and levels of occurrence. The consumption of contaminated food has been linked to liver and esophageal cancer, nephropathy, suppression of the immune system and growth retardation in humans, as well as hyperestrogenic syndrome and abortions in animals. In addition, preventive strategies and the management of contaminated agricultural products cause economic losses of millions of dollars annually. The search of strategies to manage mycotoxin contamination in food and feed poses an important challenge, the use of polyphenols with antimicrobial effect could represent a promising option. Polyphenols are plant secondary metabolites which are considered part of the plant innate immune system. Despite the well-known antimicrobial effect of polyphenols and the prevalence of mycotoxins in agricultural products, there are no studies analyzing the effect of nanoencapsulated extracts of these compounds from tropical fruits on mycotoxin production in grains such as maize, common beans and rice. The nanoencapsulation of polyphenols could improve their stability and regulate their solubility. In this project, we use nanoencapsulated polyphenols from tropical fruits to determine their antimycotoxigenic potential in storage grains.

Main objective

To investigate the potential of nanoencapsulated polyphenols from tropical fruits to reduce mycotoxin contamination in storage grains.

Intern knowledge required

Basic knowledge in microbiological cultures and in chemistry (chemicals handling and liquid chromatography-mass spectrometry principle).

Intern tasks and responsibilities

Controlled assays with nanoencapsulated polyphenols to determine their antimycotoxigenic potential in storage grains.

Extraction and measurement of mycotoxin production using UHPLC-MS/MS.

Interaction with researchers.