

# CHAPTER I

## INTRODUCTION



Aflatoxins are toxic, carcinogenic fungal metabolites that can occur in foods and feeds worldwide. Health concerns and regulations that limit the uses of contaminated commodities greatly influence the profitability of several crops in Thailand. Aflatoxins are produced by toxigenic strains of *Aspergillus flavus* or *Aspergillus parasiticus*. Conventional methods for the prevention of contamination may not be reliable on a large commercial scale. Novel control methods are still needed. One such method is to displace the toxigenic strains of *A. flavus* with atoxigenic strains of *A. flavus* that do not produce aflatoxins. This strategy of competitive displacement is possible because of the great diversity of phenotypes of *A. flavus* in agricultural fields and the common occurrence of atoxigenic traits. Furthermore, toxigenicity is apparently unrelated to a strain's ability to colonize and/or infect living or dead plant tissues. These observations led us to speculate that atoxigenic strain might be used to displace toxigenic strains. In theory, competitive exclusion of toxigenic strains from crops might reduce the overall toxigenicity of *A. flavus* populations. Objective of this work is to determine the genus and related members of *Aspergillus* section *Flavi* isolated from corn fields in Thailand and their ability to produce aflatoxins. The ability of atoxigenic isolates to intraspecifically inhibit aflatoxin synthesis by a toxigenic isolates of *A. flavus* will be evaluated. This should provide potential isolates that could be tested in the field for biocontrol of aflatoxin contamination of corn.

## Objectives

1. Collection of the soil samples from different corn fields of Thailand.
2. Isolation and identification of *Aspergillus* section *Flavi* members from the soil samples.
3. Determination of Vegetative Compatibility Groups (VCG) testing of the isolated *A. flavus*.
4. Determination of aflatoxins producing ability of isolates of *Aspergillus* section *Flavi*
5. Determination of intraspecific aflatoxins inhibition of *A. flavus* by an atoxigenic isolates.