

1 Introduction

Mycotoxins – from the Greek *μύκης* (*mykes*, *mukos*) “fungus” and the Latin *toxicum* “poison” – are a large and growing family of secondary metabolites and hence natural products produced by fungi, in particular by molds (1). It is estimated that well over 1,000 mycotoxins have been isolated and characterized so far, but this number will increase over the next few decades due the availability of more specialized analytical tools and the increasing number of fungi being isolated. However, the most important classes of fungi responsible for these compounds are *Alternaria*, *Aspergillus* (multiple forms), *Penicillium*, and *Stachybotrys*. The biological activity of mycotoxins ranges from weak and/or sometimes positive effects such as antibacterial activity (*e.g.* penicillin derivatives derived from *Penicillium* strains) to strong mutagenic (*e.g.* aflatoxins, patulin), carcinogenic (*e.g.* aflatoxins), teratogenic, neurotoxic (*e.g.* ochratoxins), nephrotoxic (*e.g.* fumonisins, citrinin), hepatotoxic, and immunotoxic (*e.g.* ochratoxins, diketopiperazines) activities (1, 2), which are discussed in detail in this volume.

The hazardous nature of mycotoxins was first associated with a disease (mycoroxicosis) in the mid-1950s (3), however, mycotoxin-associated diseases have been known for centuries. For example, aflatoxin was isolated and identified in 1961, following a 1960 incident in which 100,000 turkey poults in the British Isles died from eating feed containing contaminated peanut meal (3).

Currently, many laboratories around the world have specialized in the detection of mycotoxins (4) in food products and contaminated housing supply materials (5). A large number of review articles, books, and book chapters have appeared on this topic in the last 50 years.

In this volume, we will focus on the most important classes of mycotoxins and discuss advances in their chemistry over the last ten years. In each section, the individual biological impact will be discussed. The chapters have been arranged according to mycotoxin class (*e.g.* aflatoxins) and/or structural classes (*e.g.* resorcylic acid lactones (6), diketopiperazines (7, 8)). The biological aspects will be treated only in brief (9). For a recent, comprehensive treatise of mycotoxin chemistry, we refer the reader to a major review (10).