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# Mycotoxins in Chinese Edible and Medicinal Foods: Fungal Occurrence and Diversity Analysis

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#### Introduction

Mycotoxins are toxic compounds produced by certain species of fungi that can contaminate food and medicinal plants, posing significant risks to human health and the economy. These toxic substances are capable of causing a variety of health issues, including liver and kidney damage, immune suppression, cancer and reproductive disorders. In China, a country rich in edible and medicinal plants, the occurrence of mycotoxins in common foods and herbal medicines is a growing concern. With a long history of herbal medicine, China is home to a vast range of medicinal plants and edible substances that are integral to both Traditional Chinese Medicine (TCM) and the modern food industry. As the global food supply becomes increasingly interconnected, it is important to understand the diversity of fungi that produce mycotoxins in these plants and how to mitigate their harmful effects. This article presents an overview of the occurrence and diversity of fungi in Chinese edible and medicinal foods, as well as their potential to produce mycotoxins. We will discuss common fungal species, their mycotoxin production and the implications of fungal contamination in the context of food safety and public health in China [1].

### Description

Fungal contamination of food and medicinal plants occurs primarily during the growing, harvesting, storage and processing stages. Factors such as humidity, temperature and poor handling conditions can promote the growth of mycotoxin-producing fungi. In China, the climate is conducive to the growth of a wide variety of fungi, particularly in regions with high humidity and temperatures, such as the southeastern and central parts of the country. The use of these contaminated plants in both food products and traditional medicines poses a risk to public health. The most common mycotoxinproducing fungi in China include species of Aspergillus, Penicillium and Fusarium. These genera are responsible for the production of some of the most concerning mycotoxins, including aflatoxins, ochratoxins, fumonisins and trichothecenes. The contamination of edible and medicinal plants by these fungi can occur at any stage, from field contamination to post-harvest storage, with some fungi even thriving in dried and processed products [2].

The genus Aspergillus is one of the most prevalent fungi associated with mycotoxin contamination in both edible and medicinal plants. Particularly, Aspergillus flavus and Aspergillus parasiticus are known to produce aflatoxins, one of the most potent carcinogens identified to date. Aflatoxins, particularly Aflatoxin B1 (AFB1), can contaminate a wide range of crops, including peanuts, maize, rice and tree nuts. In China, aflatoxin contamination has been reported in staple crops such as maize, wheat and rice, which are commonly consumed in both food and medicinal applications. Aflatoxins are highly toxic and can

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cause acute and chronic liver damage, immune suppression and carcinogenic effects. They are considered a significant health risk, particularly in regions where contaminated foodstuffs are a major part of the diet. Moreover, due to their resistance to heat and processing, aflatoxins can persist even after cooking, which increases their potential for human exposure [3].

The genus Penicillium is another important group of fungi that can contaminate food and medicinal plants with mycotoxins. Penicillium expansum, for instance, produces ochratoxin A (OTA), a mycotoxin that has nephrotoxic and carcinogenic properties. Ochratoxin A has been detected in various foodstuffs, including cereals, fruits and wine and is a major concern in both developed and developing countries. In China, *Penicillium* species are commonly found in stored grains, fruits and herbs. The presence of OTA in these food products, especially in those with long shelf lives, such as dried fruits, raisins and herbal medicines, highlights the potential health risks associated with mycotoxin exposure through traditional foods and remedies.

Fusarium species, including *Fusarium graminearum* and *Fusarium verticillioides*, are responsible for the production of several mycotoxins, including trichothecenes, zearalenone and fumonisins. These mycotoxins are commonly found in grains such as wheat, maize and barley, which are staple foods in China. Among these, fumonisins are particularly concerning due to their association with esophageal cancer and neural tube defects. Fumonisins have been detected in high levels in corn, which is widely consumed in China as a primary food ingredient. Trichothecenes, produced by Fusarium species, are potent inhibitors of protein synthesis and can cause severe poisoning, leading to vomiting, diarrhea and immunosuppression. They have been found in a variety of contaminated crops and agricultural products. Fusarium species are especially problematic in regions where maize and wheat are stored in unfavorable conditions, allowing fungal growth and subsequent mycotoxin production [4].

Traditional Chinese Medicine (TCM) is based on the use of medicinal plants and herbs, many of which are grown in the rich, biodiverse regions of China. The use of these plants in the treatment of a wide range of ailments means that contamination by mycotoxins is of particular concern. Medicinal herbs such as Ginseng, Ginkgo biloba, Astragalus and Schisandra are commonly used in TCM and research has found that mycotoxins like aflatoxins, ochratoxins and trichothecenes can be present in these plants. Given the significant role of TCM in China's healthcare system, ensuring the safety of medicinal plants from fungal contamination is crucial. Some studies have shown that mycotoxins can be present in both raw and processed medicinal herbs, potentially compromising the safety and efficacy of these remedies. Furthermore, the lack of rigorous quality control in some traditional practices may contribute to the issue, making regulation and monitoring essential [5].

# Conclusion

The occurrence of mycotoxins in Chinese edible and medicinal foods is a significant public health concern, as these toxins can cause a range of serious health issues. Understanding the diversity of mycotoxin-producing fungi in common crops and medicinal plants is essential for developing effective strategies to reduce contamination. As the demand for safe food and medicinal products grows, China's agricultural and regulatory systems must adapt to address these challenges. By improving agricultural practices, post-harvest handling and monitoring, the risk of fungal contamination and mycotoxin production can be mitigated, ensuring safer food and herbal medicines for consumers. Routine monitoring of food and medicinal products for mycotoxin

contamination is essential. Regulatory bodies in China are working to establish stricter guidelines for mycotoxin levels in food and herbs, ensuring that products meet safety standards before reaching consumers. Educating farmers, producers and consumers about the risks of mycotoxin contamination and the importance of safe agricultural practices and food handling is critical. Awareness campaigns and workshops can help to improve practices and reduce the risk of contamination.

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# **Conflict of Interest**

There is no conflict of interest by author.

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