Development of Mycotoxin Inhibition Methods in Edible Mushroom and Spent Mushroom Substrate

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Abstract

Food safety is the basis of national development and social stability. However, as the natural disintegrator, fungi have a wide distribution range and strong stress resistance, which not only pollute the planting industry with concentrated raw materials, but also the processing industry, aquaculture industry and the whole food chain including "collection, storage, transportation and marketing", and this phenomenon will be worsened due to global warming. It causes losses of up to 2% of total food production. Mycotoxins are secondary metabolites produced by fungi. Since the discovery of Aflatoxin (AF) in 1960, more than 300 kinds of mycotoxins have been discovered, most of which are classified as Class A or B carcinogens by the International Agency for Research on Cancer (IARC) and the World Health Organization (WHO). They are not easily degraded and can be enriched in the human body along the food chain. It is a serious threat to human health, and the control of mycotoxins has become a worldwide problem and hot spot. The methods of mycotoxin control can be divided into three categories: physical, chemical and biological, among which the biological control methods using the natural antagonistic function show great potential and development space, and the controllable effect is better. Based on the balance of interdependence and constraints among biological populations in nature, our Biotoxin team is committed to developing technologies and products for the prevention and control of toxigenic fungal pollution in edible mushrooms, including: a) Physical adsorption of mycotoxins by mushroom fruiting body structure. b) Mycotoxin-degrading enzymes and inhibitory factors synthesized and secreted by mushroom cells. c) Natural antagonistic microorganisms isolated from the spent mushroom substract (SMS). Our study expects to fully develop agricultural products and recycle associated waste resources, prevent mycotoxin pollution without causing secondary damage to food, and achieve sustainable agriculture with loss reduction, quality preservation, efficiency enhancement and value-added.

Keywords

Mycotoxin Inhibition, Cell Communication, Edible Mushroom, Enzyme Preparation, Circular Agriculture