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Climate Change influence in fungi

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The International Panel on Climate Change (IPCC, 2013) and almost the entire scientific community agreed to consider the Mediterranean Area as one of the most vulnerable regions in the world to the impacts of global warming. In this scenario, heat waves, defined by the World Meteorological Organization as five or more consecutive days of heat reaching a daily maximum temperature at least 5 °C higher than the average maximum temperature, have been recently foreseen to be particularly frequent and intense in Portugal. As a consequence, agriculture constitutes one of the most sensitive sectors that could be affected by the climate change. Among the xenobiotics contaminating agricultural crops, mycotoxins (MY) are the most challenging since their presence represents an economic burden due to crops loss and a serious health effects related for animal and human with severe repercussions. Many fungal plant pathogens species from Aspergillus and Fusarium genera produce MY harmful to animal and human health. The contamination of cereals grains is commonly reported, and the climate change scenario can also influence significantly the contamination during postharvest phase having implications in food security and safety aspects. Additionally, it is foreseen that specific species increase due to climate change leading to higher use of azole-based fungicides. Azole-based fungicides are the most used antifungals to control fungi and MY production in crops. However, excessive and long-term use of azole fungicides in agriculture has led to the emergence of acquired azole resistance in some plant pathogenic fungi and also trigger in potential pathogenic fungi for humans and the toxigenic potential. Overall, climate changes can trigger crops contamination by toxigenic fungal species, increase human exposure to mycotoxins, promote the acquired azole resistance and, consequently, the occurence of life-threatening infections.