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UNIVERSITÀ CATTOLICA del Sacro Cuore

Aspergillus flavus and *Fusarium verticillioides* interaction: modeling the impact on mycotoxin production

ISSUE

The influence of **climate change** on agriculture has a great impact on **food security and safety**. The occurrence of mycotoxins would be greatly affected by future climate scenarios. Temperature and CO_2 increases, variation in rainfall and extreme weather events, affect the dominant fungal species. The aim of this work was to study *Aspergillus flavus* and *Fusarium verticillioides* co-occurrence *in vitro* in order to collect and model the effect of fungal interaction on growth and mycotoxin production.

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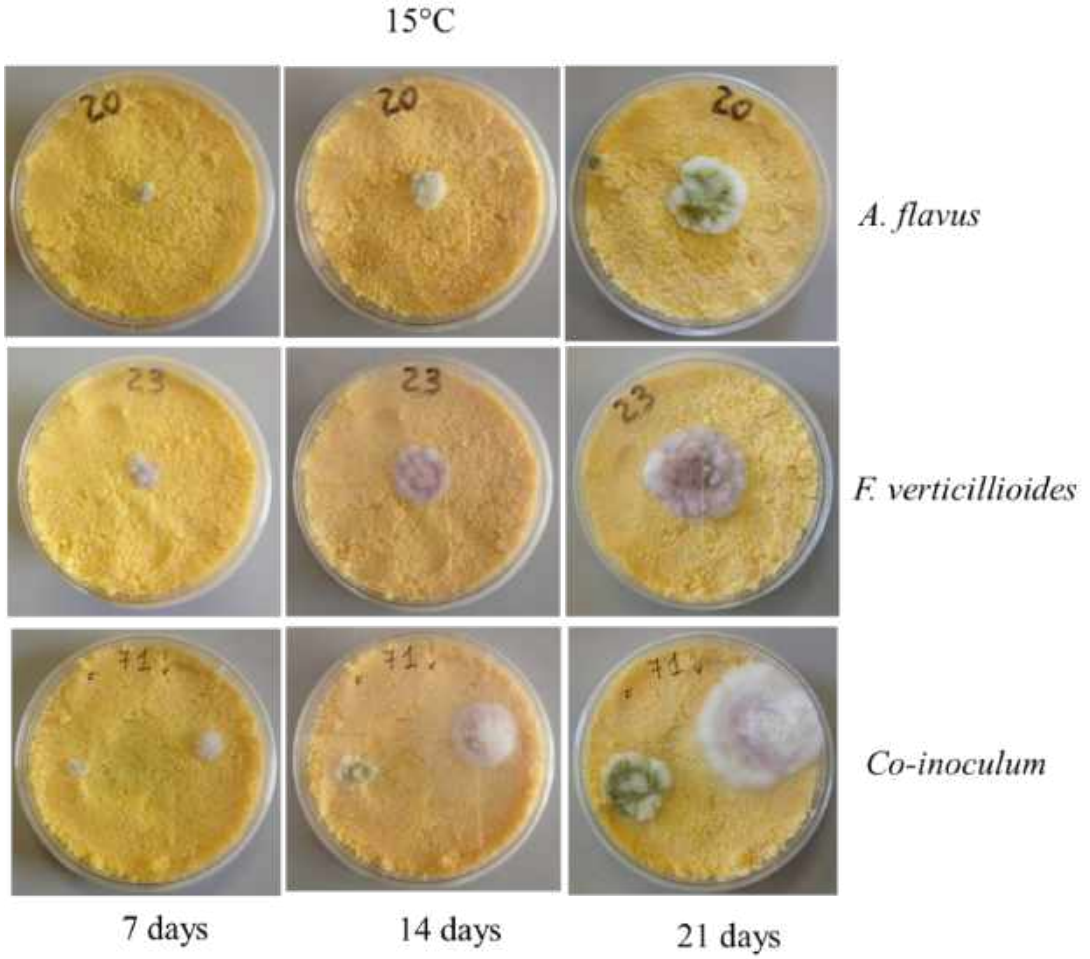
APPROACH

Experimental trials were organized with *A. flavus* and *F. verticillioides* grown alone or together.

They were incubated at different temperature regimes (10-40°C, step 5°C) for 21 days.

Fungal growth was measured weekly, while AFs and FBs were quantified at the end of the incubation period.

Quantitative collected data were modelled using non-liner regression



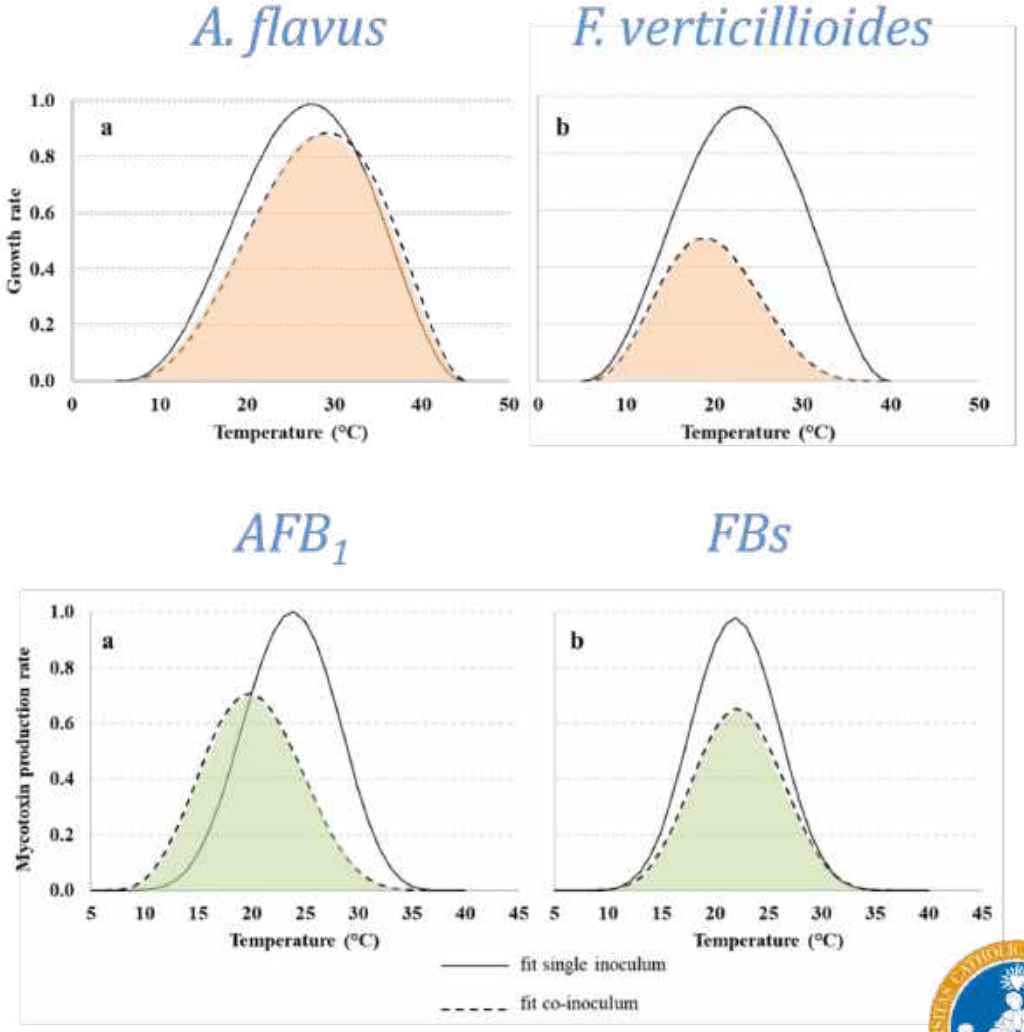
Colonies of *A. flavus* and *F. verticillioides* grown alone colonies and together on corn meal medium incubated at 15°C for 7, 14, and 21 days.

Each fungus was affected by the presence of the other fungus; *A. flavus* and *F. verticillioides* showed a decrease in colony diameter of 10% and 44%, respectively, when they were grown together, compared to alone .

OUTCOMES

Fungal growth and toxin production in different temperature regimes were well described, both for *A. flavus* and *F. verticilliodes*, by a Bete function.

The developed functions will be used to improve predictive models performances.



Camardo Leggieri M, Giorni P, Pietri A and Battilani P 2019
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