

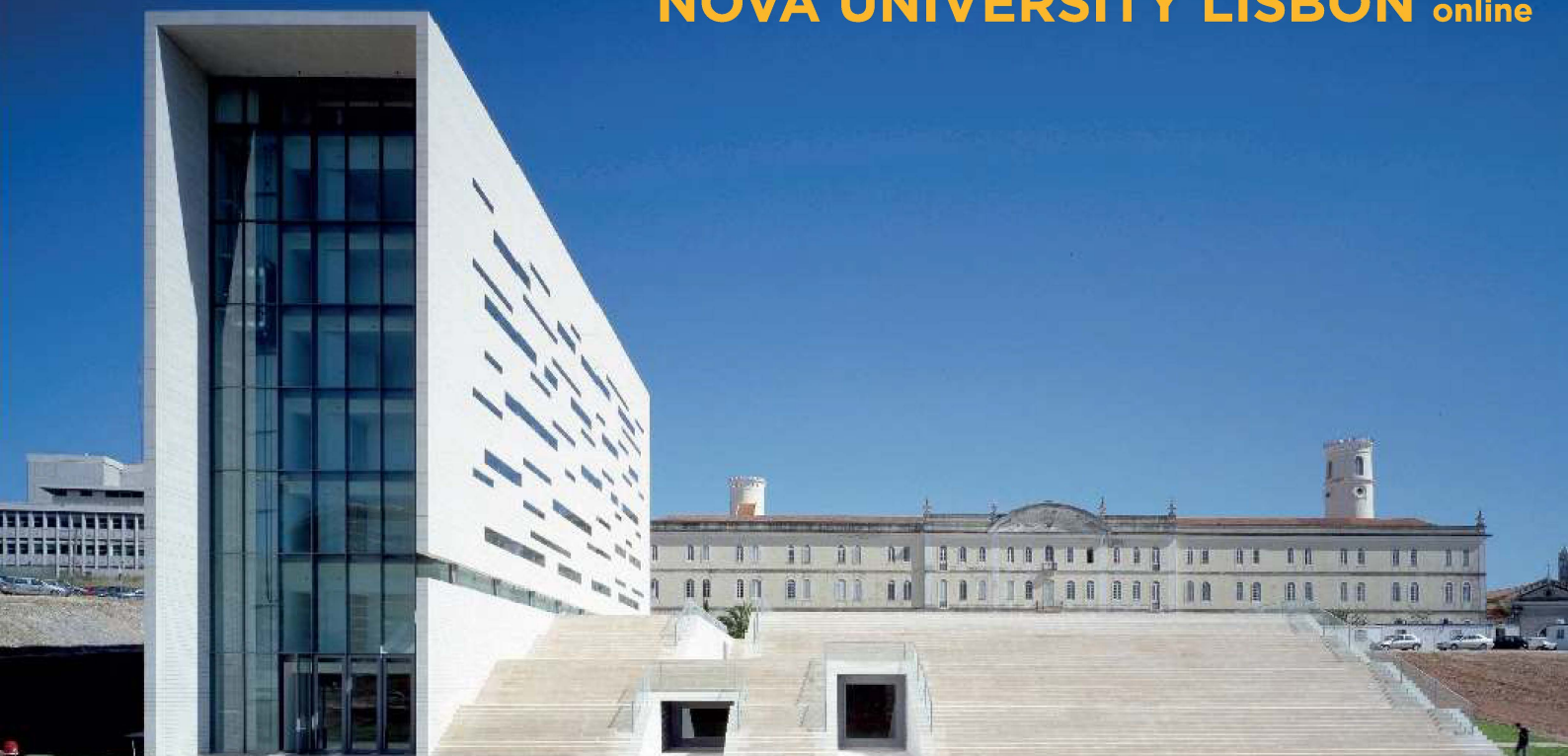
# MICROBIOTECH 21

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CONGRESS OF MICROBIOLOGY AND BIOTECHNOLOGY 2021

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#### **458. Enzymes and secondary metabolites profiles of *Gnomoniopsis smithogilvyi* are affected by chestnut medium**

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Chestnut tree (*Castanea sativa* Mill) is a crop with high economic and social importance in Trás-os-Montes Region. The pre and post-harvest quality of its nuts can be affected by many factors, being the losses due to fungi very large. During the last decade a new endophyte fungus, *Gnomoniopsis smithogilvyi*, causing brown rot, has been isolated from both rotten and healthy fruits, and its growth seems to be related with the increase of air temperature and rainfall during spring. The present study aims to understand the influence of chestnut substrate on *G. smithogilvyi* biochemistry, in order to develop strategies to reduce its incidence in the fruit and improve the control of brown rot. Initially, the presence of the enzymes involved in the decomposition of chestnuts, such as amylase, proteases, carboxymethylcellulase (CMCase),  $\beta$ -glucosidase, xylanase, among others, was investigated. Further, some hydrolase activities were evaluated in two isolates of *G. smithogilvyi* incubated in potato (PDB) and chestnut media (CM) along an incubation period (3, 7 and 14 days), in order to study the effects "isolate", "medium" and "incubation period" on enzymes production. Also, the synthesis of secondary metabolites in fungal dry biomass was assessed by Liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS). All isolates produced the enzymes screened and, in general, the enzyme production varied between the isolates ( $P < 0.0000$ ), the media ( $P < 0.0000$ ) and along the incubation period ( $P < 0.0000$ ). Amylase activity was positively correlated with xylanase ( $P < 0.0001$ ), CMCase ( $P < 0.0001$ ), and Avicelase ( $P < 0.01$ ), xylanase with CMCase ( $P < 0.01$ ) and  $\beta$ -glucosidase with Avicelase ( $P < 0.0001$ ). By contrast,  $\beta$ -glucosidase was negatively correlated with CMCase ( $P < 0.01$ ). Twenty secondary metabolites were detected along the incubation: eight in both isolates and media, five and three only in isolates grew in PD or CM, respectively. Some of these metabolites had been associated with other fungi and have known biological activities.



The enzymatic profile of this species explains its rapid growth in post-harvest chestnuts, and its ability to synthesize some toxins drawing our attention to the potential risks involved with healthy chestnuts contaminated with *G. smithogilvyi*, reinforcing the need to control it on the orchards.

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