

Antimicrobial and antioxidant activities of aqueous extracts of *Lentinula edodes* var. Donko and Koshin

A. Afonso^{1,2}, C. Fernandes¹, J. Garcia², G. Marques², F. Nunes^{2,3}, M. J. Saavedra²

¹CIMO - Centro de Investigação de Montanha, Instituto Politécnico de Bragança, 5300-253 Bragança, Portugal

²CITAB - Centre for the Research and Technology of Agro-Environmental and Biological Sciences, University of Trás-os-Montes e Alto Douro, 5001- 801 Vila Real, Portugal

³CQ - Centro de Química, University of Trás-os-Montes e Alto Douro, 5001- 801 Vila Real, Portugal

anacris.afonso@hotmail.com

Antimicrobial resistance is recognized by the WHO as a serious Public Health problem, representing a global challenge for medicine¹. Hence, it is important to discover novel and effective antimicrobial substances against pathogenic microorganisms resistant to conventional treatments. Naturally produced antimicrobials have increased popularity and, among them, mushrooms could be a promising alternative as source of new antimicrobials². The aim of this work is related to the investigation on two extracts varieties of *Lentinula edodes* (shiitake) mushroom (var Donko and var Koshin), particularly regarding its antimicrobial activity, antioxidant potential and chemical composition. Antimicrobial activity of both aqueous extracts was evaluated by the disk diffusion method in Mueller-Hinton agar, against methicillin-sensitive and resistant *Staphylococcus aureus* (MSSA and MRSA, respectively) clinical isolates. Total phenolic content and ABTS^{•+} scavenging assay was performed to evaluate the in vitro antioxidant capacity of the extracts. Although both varieties extracts showed antimicrobial activity against both MSSA and MRSA var Koshin was the one that exhibited stronger antibacterial activity and higher ability to scavenge ABTS free radicals, being correlated with the higher total phenols content. These results exalt the potentialities of shiitake var Koshin aqueous extracts as an important and valuable therapeutic source to be used against multi-resistant bacteria.

References:

¹WHO, 2014. Antimicrobial resistance: global report on surveillance 2014.

²Gyawali, R., Ibrahim, S.A., 2014. Natural products as antimicrobial agents. Food Control 46, 412-429.

Acknowledgements: This work was supported by the project I&DT Companies in Co-Promotion FungiTech, Norte-01-0247-FEDER-033788; National Funds by FCT - Portuguese Foundation for Science and Technology, under the project UID/AGR/04033/2019 (CITAB - Center for the Research and Technology of Agro-Environmental and Biological Sciences), Centro de Química -Vila Real (PEst-OE/QUI/UI0616/2014) and CIMO - Centro de Investigação de Montanha (UIDB/00690/2020). The authors thank to CHTMAD - Hospital Center of Trás-os-Montes and Alto Douro for availability of the isolates (approved by the ethical committee).