New perspectives of Juglans regia L. phytochemicals against Candida species

Natália Martins,[1,2] Lillian Barros,[1] Ana Maria Carvalho[1], Sónia Silva,[2] Mariana Henriques,[2] Isabel C.F.R. Ferreira[1]

[1]Mountain Research Centre (CIMO), ESA, Polytechnic Institute of Bragança, Portugal.
[2]IBB - Institute for Biotechnology and Bioengineering, Centre of Biological Engineering, University of Minho, Braga, Portugal.

Opportunistic fungal infections have deserved special relevance in the last decades, presenting itself, a serious problem in terms of public health. Despite Candida albicans was considered the main agent responsible for those infections, other non-albicans Candida species have also been described in the last years [1-3]. Most of the species are susceptible to antimicrobial drugs, but recently it has been observed a growing number of microorganisms with drug resistance. Therefore, the discover/use of alternative therapies is crucial [4].

Juglans regia L. (walnut) leaves are commonly used in traditional medicine as antiseptic, antimicrobial and anti-inflammatory [5]; those benefits could be related with its richness in phenolic compounds [6]. In the present work, the antifungal potential of the hydroalcoholic extract prepared from walnut leaves was evaluated against a total of nineteen Candida strains (from the species: C.albicans, C.glabrata, C.parapsilosis and C.tropicalis), using the disc diffusion halo assay.

All the tested strains were sensible to the plant extract. The obtained values of the inhibitory zones ranged between 0.9-1.4 cm, being the halo maintained after 48h. The observed antifungal activity is certainly related to the phenolic compounds previously determined in the extract [6]: five phenolic acid derivatives- caffeoylquinic and p-coumaroylquinic acid derivatives, two dimers and one trimer of procyanidins, twelve flavonols- quercetin, myricetin and kaempferol derivatives, and five taxifolin O-pentoside isomers; 3-O-caffeoylquinic acids and quercetin O-pentoside were the main phenolic compounds. Further studies are necessaries in order to elucidate the most active compounds and the specific role of each one.

Acknowledgments: The authors are grateful to FCT (Portugal) for financial support to CIMO (PEst-OE/AGUI0690/2011), N. Martins (SFRH/BD/87658/2012), L. Barros (“Compromisso para a Ciência 2008) and S. Silva (NORTE-07-0124-FEDER-000027; QREN) contracts.

References:

[1] Kim J, Sudbery P. (2011) J Microbiol. 49, 171-177.
[2] Tsai P-W, Chen Y-T, Hsu P-C, Lan C-Y. (2013) BioMedicine. 3, 51–64.
[3] Vázquez-González D, Perusquía-Ortiz AM, Hundeiker M, Bonifaz A. (2013) J Ger Soc Dermatology. 11, 381–94.
[4] Kanafani ZA, Perfect JR. (2008) Clin Infect Dis - Antimicrob Resist. 46, 120–128.
[5] Murray MT. (2004) 2nd ed. New York, NY. Random House.
[6] Santos A, Barros L, Calhelha RC, Dueñas M, Carvalho AM, Santos-Buelga C, Ferreira ICFR. (2013) Ind Crops Prod. 51, 430-436.