Antioxidant activity and inhibitory effect of L. viridis extract on Fe2+-induced lipid peroxidation in brain homogenates

P Costa [1], S Gonçalves [1], A Romano [1]

- [1]University of Algarve, Faculty of Sciences and Technology and Institute for Biotechnology and Bioengineering (IBB-CGB/UTAD), Campus de Gambelas, Ed. 8, 8005–139 Faro, Portugal

- Congress Abstract

The brain is particularly susceptible to oxidative stress damaging effects due such events as the high consumption of oxygen, limited concentration of antioxidants and a relatively high degree of polyunsaturated fatty acids that are particularly good substrates for peroxidation reactions [1–3]. Oxidative stress could lead to damage biological target molecules, affecting the cellular function and integrity [4]. The ability of natural antioxidants, mainly phenolic compounds, to protect cells from oxidative stress has been previously demonstrated [5]. In this work, the methanol extract from *Lavandula viridis* L'Hér. (Lamiaceae), a xerophytic aromatic shrub endemic to the south-west Iberian Peninsula [6], was investigated for its effect on deoxyribose degradation, its reducing properties, Fe^{2+}-chelating ability and total phenol content. The capacity of this extract to prevent Fe^{2+}-induced lipid peroxidation in mouse brain (*in vitro*) was also evaluated. *L. viridis* extract showed Fe^{2+} chelating activity, reducing power and the ability to prevent Fe^{2+}/H_2O_2-induced decomposition of deoxyribose in a dose-dependent manner. This extract also revealed a high phenol content (893.01±17.09µmol gallic acid equivalents/g extract) evaluated by Folin-Ciocalteu method. Moreover, in brain homogenates, the methanol extract of *L. viridis* caused a high decrease in the MDA production in both the basal and the Fe^{2+}-induced lipid peroxidation. The effective protective properties of *L. viridis* could be attributed to its higher phenol content, Fe^{2+} chelating ability, reducing properties and HO· radical scavenging ability. The findings suggest that methanol extract from *L. viridis* could be a potential source of natural antioxidants.

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References: 1. Sah, R. et al. (2002)J Neurochem 80: 383–391.

2. Shulman, R.G. et al. (2004) Trends Neurosci 27: 489–495.

3. Halliwell, B., Gutteridge, J.M.C. (2007) Free radicals in Biology and medicine, Fourth Edition. Clarendon Press, Oxford Science Publications. Oxford/UK.

4. Britton, R.S. et al. (2002) Int J Hematol 76: 219–228.

5. Stalikas, C.D. (2007)J Sep Sci 30: 3268–3295.

6. Nogueira, J.M.F., Romano, A. (2002) Phytochem Anal 13: 4–7.