ACETYLCHOLINESTERASE INHIBITORY ACTIVITY OF *GALANTHUS GRACILIS* AND *G. XVALENTINEI* NOTHOSUBSP. *SUBPLICATUS*

© Unver Somer N., Sarıkaya B., Onur M. A., Kaya G. I.

Department of Pharmacognosy, Faculty of Pharmacy, Ege University, Bornova-Izmir, 35100, Turkey

Alzheimer's disease (AD) is one of the most common cause of dementia in the elderly people. It is known to affect about 36 million people around the world. Acetylcholinesterase (AChE) inhibitors are major drugs for the symptomatic treatment of AD. Natural products constitute an important source for AChE inhibitors. For example galanthamine, an Amaryllidaceae alkaloid is used in the treatment of mild to moderate AD. Moreover, some Amaryllidaceae alkaloids have been found to exhibit similar or more potent AChE inhibitory activity when compared to galanthamine (1, 2). Therefore, Amaryllidaceae family is considered a major source to find better AChE inhibitors. Among the Amaryllidaceae genera found in Turkey, the genus *Galanthus* is represented by 14 taxa and one hybrid (3). In the present study, the AChE inhibitory potentials of *Galanthus gracilis* Čelak. and a naturally occuring *Galanthus* hybrid, *G. xvalentinei* (J. Allen) Beck nothosubsp. *subplicatus* (N. Zeybek) A. P. Davis were determined. A microplate assay modified from *in vitro* Ellman's method (4) is used to evaluate the AChE inhibitory activity of the alkaloidal extracts prepared from the bulbs and aerial parts of the above-mentioned plants. The final concentrations of the extracts in the assay ranged between 0.25–150 µg/ml. The enzyme inhibitory activity was calculated as a percentage compared to blank. IC_{50} values were evaluated by software package GraphPad Prism V3.0 (GraphPad Software, San Diego, CA). All of the extracts prepared from *G. gracilis* (bulbs: IC_{50} = 11.82 µg/ml, aerial parts: 25.5 µg/ml) and G. *xvalentinei* nothosubsp. *subplicatus* (bulbs: IC_{50} = 21.31 µg/ml, aerial parts: 16.32 µg/ml) showed remarkable AChE inhibitory activity. Galanthamine was used as a positive control (IC_{50} = 0.043 µg/ml).

References: (1) Williams, P., Sorribas, A., Howes, M.-JR., (2011) Nat. Prod. Rep. 28 (1): 48–77. (2) Houghton, P. J., Ren, Y., Howes, M.-J., (2006) Nat. Prod. Rep. 23: 181–199. (3) Davis, A. P., (2006). The genus *Galanthus*-snowdrops in the wild, in: Bishop, M., Davis, A. P., Grimshaw, J. (Eds), Snowdrops, A Monograph of Cultivated *Galanthus,* Griffin Press Publishing Ltd, Cheltenham, pp 9–63. (4) L pez, S., Bastida, J., Viladomat, F., Codina, C., (2002). Life Sci. 71: 2521–2529.

Acknowledgements: *This study was financially supported by Ege University Research Fund (09/ECZ/021).*

SCAVENGING EFFECTS OF HYDROLISATES OBTAINED FROM THE SEA URCHINS COELOMIC FLUID

© Urakova I. N., Pozharitskaya O. N., Makarov V. G.

St-Petersburg Institute of Pharmacy, 47/5, Piskarevsky prosp., 195067, St-Petersburg, Russia

Sea urchins possess an innate immune system and are regarded as a potential source of bioactive substances due to their coelomic fluid (CF). Coelomocytes constitute the defence system, which is capable of chemotaxis, phagocytosis, and production of cytotoxic metabolites. Bioactive substances from marine source may be produced by enzymatic hydrolysis of marine organisms and isolated tissues. Peptides and amino acids of the hydrolisates may exhibit significant antioxidant properties (1). Coelomic fluid from the fresh green sea urchins *Strongylocentrotus droebachiensis* were collected and hydrolyzed immediately during 1.5 and 3 hours at 50 °C. The enzymes used were: Alcalase 2.5 L (A), Flavourzyme 1000 L (F) (Novozymes, Denmark) and Protex 6L (P6L) (Genencor International, Netherlands). Process of hydrolysis was stopped by heating in boiling water for 10 min to inactivate proteases. The coelomic fluid hydrolysates (CFH) were centrifuged (10 min at 7,000 rpm) and the supernatants were lyophilized and stored in a refrigerator until use. Amino acids (AA), peptides levels (P) in CFH and scavenging effect of CFH on α, α-diphenyl-β-picrylhydrazyl (DPPH) free radical were determined spectrophotometrically by OPHA (2), Warburg-Christian (3) and DPPH *in vitro* (4) methods, respectively.

The highest levels of amino acids and peptides were obtained after hydrolysis for 3 hours with Flavourzyme 1000 L: 12.0 ± 0.5 and 22.4 ± 0.5 %, respectively. This hydrolisate possessed the most effective abilities as