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Application of FRAP method for the determination of the antioxidant activity of new peptide esters of Galanthamine

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ABSTRACT

Introduction. Highly reactive free radicals by oxidizing of proteins, lipids or DNA could initiate degenerative diseases including atherosclerosis, cancer, diabetes, cerebral ischemia and neurodegenerative disorders. The important health – protecting role of antioxidants is due to their ability to scavenge the free radicals.

Aim: The aim of current study is to apply the method of ferric reducing/antioxidant power (FRAP) for the determination of antioxidant activity of new synthesized peptide esters of Galanthamine: 3,4 – dichlorophenyl – Alanil – Leucil – Glycil – Galanthamine (Leu – Gal) and 3,4 – dichlorophenyl – Alanil – Valil – Glycil – Galanthamine (Val – Gal).

Method. FRAP assay is applied for the determination of antioxidant activity. Butylated hydroxytoluene (BHT) is used as a positive control. FRAP assay is based on the reduction by the antioxidant of a ferric – TPTZ (2, 4, 6 – tripyridyl – s – triazine) complex to it's ferrou intense blue colored form, which increasing absorbance at λ = 593 nm at low pH in the dark conditions for 30 min., is proportional to the reducing power of electronodonating compound.

Results. The results from applying the FRAP method to compounds are expressed in μM Trolox (6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid) equivalent $mmol^{-1}$ (TE $mmol^{-1}$). The obtained experimental values for FRAP are respectively: Leu – Gal (22.65 ± 0.15), Val – Gal (24.30 ± 0.30). This results are comparable to FRAP of BHT: 26.85 ± 0.15 TE $mmol^{-1}$.

Conclusion: The examined Galanthamine peptide esters: 3,4 – dichlorophenyl – Alanil – Valil – Glycil – Galanthamine and 3,4 – dichlorophenyl – Alanil – Valil – Glycil – Galanthamine possess a significant antioxidant activity comparable to the standard BHT.

Key words: Galanthamine, peptide esters, antioxydant activity, FRAP.