

ANTIOXIDANT AND ANTI-INFLAMMATORY PROPERTIES OF PLANT EXTRACT FROM LIMONIUM GMELINII

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Introduction: Disruption of the blood-brain barrier (BBB) plays key role in the development of neurological dysfunction in acute and chronic cerebral ischemia. Numerous studies have demonstrated that ischemia and reperfusion initiate oxidative stress and inflammatory cascade in the BBB that contribute to further damage of neurons. Thus, agents targeting cell adhesion molecules expression, ROS production and activation of pro inflammatory cytokines may have therapeutic value. It has been reported previously, that reach with polyphenols extract of a plant Limonium Gmelinii exerts a wide range of therapeutic action. Here, we studied its antioxidant and anti-inflammatory potential in relation to the cells forming BBB.

Methods: Human primary astrocytes and mouse bEnd3 line of CECs (ATCC) were applied in this research as following: the cells were pretreated with extract of L. gmelinii followed by TNF- α or H₂O₂ exposure. We quantified ROS generation, NADPH activation, P-selectin expression and activity of ERK1/2 in the cells using quantitative fluorescence, confocal microscopy and western blotting.

Results: We have demonstrated that in astrocytes TNF- α induces overproduction of ROS, activation of NADPH oxidase and ERK1/2 phosphorylation. In CECs, exposure by TNF- α or H₂O₂ exerts similar effects; in addition TNF- α triggers accumulation of P-selectin on the surface of the CECs. In turn, pretreatment with extract of L. gmelinii suppresses induced by TNF- α and H₂O₂ oxidative stress and proinflammatory responses in both cell types.

Conclusion: Our results demonstrate that extract from Limonium gmelinii possesses antioxidant, astro- and vasculoprotective properties and can neutralize proinflammatory effect of TNF- α .