

Antitumor effects of ethanol *Lycium ruthenicum* extract by downregulation Nrf-2 in human colon cancer cells

Ana D. Obradović¹, Milica G. Paunović¹,
Branka I. Ognjanović¹, Milan Stanković¹, Miloš M. Matić¹

Colon cancer is the most common malignant tumor of visceral organs of the abdominal cavity. The use of conventional chemotherapeutics cause a significant level of toxicity and damage to healthy tissues, as well as the appearance of resistance, which is why an increasing number of new therapeutic regimes are being focused on the use of natural products. The aim of this study was to investigate the antitumor effects of six different concentrations of ethanol extract of *Lycium ruthenicum* (EELR), popularly referred to as Goji berries, on HCT-116 cell line. The parameters of cell proliferation and oxidative/antioxidative status were measured spectrophotometrically after short-term treatments (24h) and long-term treatment (72h). Migration potential was tested for two concentrations after 72h exposure, using Boyden chamber transwell migration assay, as well as Nrf-2 expression level by ELISA in human colon cancer cell line. The acquired results suggest that all concentrations of EELR exhibited antiproliferative effects, while cell viability was decreased in dose-dependent manner after both treatments. The results showed a decrease in superoxide anion radical concentrations, while nitrite concentrations and glutathione levels were increased compared to non-treated cells. The concentrations of total glutathione were increased in dose-dependent manner. The investigated EELR reduced the migration index of HCT-116 cells and downregulated the expression level of Nrf-2. These data indicate that EELR exerts significant antiproliferative activity and reduces migratory capacity, suggesting a potential antitumor effect. The reduced levels of Nrf-2 expression suggest decreased defense potential for oxidative disturbances, which could be the major antitumor mechanism detected in the study.

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Corresponding Author:

dr Ana D. Obradović
Department of Biology and Ecology, Faculty of Science, University of Kragujevac
Radoja Domanovića 12, 34111 Kragujevac, Serbia
ana.obradovic@pmf.kg.ac.rs
Phone: +381 34 336 223
Fax +381 34 335 040