

SPANOU CHRYSOULA

## **STUDY OF BIOLOGICAL PROPERTIES STUDY OF EXTRACTS FROM SEVERAL VARIETIES OF LEGUME**

### **ABSTRACT**

In recent years, a lot of research has been done in the development of chemopreventive agents derived from foods which constitute integral part of human diet. Legumes, which play a crucial role in many diets worldwide, are thought to be related with beneficial health implications in chronic diseases such as certain cancer types (colon, breast, prostate), cardiovascular diseases and diabetes. Except from their known high nutritive value, significant quantities of phytochemical compounds are identified in legumes and considered to be responsible for their beneficial effects. The heterogeneity in the varieties of legumes along with their complicated and different phytochemical composition, make important the need for further research on the bioactive compounds present in legumes and their biological properties. Thus, the aim of the present study was to evaluate the biological activities of 34 aqueous and methanolic extracts derived from 11 Greek *Leguminosae* family plants, in order to discover new chemopreventive agents. According to the results, the tested plant extracts can be considered as an important source of chemopreventive agents. More specifically, they exhibited potent radical scavenging properties and protective properties against free radical-induced DNA damage. Additionally, they affected the activity of enzymes involved in oxidative stress regulation, they inhibited the catalytic activity of topoisomerase I and had less potent antimutagenic activity against bleomycin-induced mutagenicity. The polyphenols present in the extracts were the bioactive phytochemical compounds responsible for the observed properties.

*Lathyrus laxiflorus* subsp. *laxiflorus* plant extracts exhibited the most potent chemopreventive properties. Thus, in extending the aforementioned results the aqueous aerial plant parts extract of *Lathyrus laxiflorus* subsp. *laxiflorus* was chosen in order to evaluate its chemopreventive properties in cancer and normal cells. The results indicate that there is a possible relation between the *in vitro*

antioxidant/chemopreventive properties of this extract and its properties observed in the tested cellular systems. However, there must be caution in the effective extract concentrations because beyond a critical concentration the bioactive extract components may act as prooxidants and be toxic for the cells. This is concluded by the fact that *Lathyrus laxiflorus* subsp. *laxiflorus* plant extract at concentrations higher than 50 µg/mL had prooxidant properties. The results obtained indicate the tested legume plant extracts as important source of chemopreventive agents and suggest their use as supplements in biofunctional food. The present study indicate *Lathyrus laxiflorus* subsp. *laxiflorus* plant as the most important source of chemopreventive agents and suggests further research on the *in vivo* properties of its extracts.