The edible plant *Asphodeline lutea*: a review of its phytochemical analysis, nutritional value and pharmacological activity

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Introduction

Asphodeline lutea (L.) Rchb. (Xanthorrhoeaceae) is a wild edible plant, traditionally consumed in the Mediterranean diet. The edible use of its roots, shoots, flowers and leaves has been known for a long time. The ancient Greeks roasted the roots like potatoes and ate them with salt and oil or mashed them with figs. The raw fresh flowers are very decorative and a tasty addition to salad, while the young shoots are eaten cooked. Several *Asphodeline* species, including *A. lutea, A. cilicica, A. damascena, A. globifera,* and *A. taurica*, are consumed in salads in different regions of Turkey.The herb is native to southeastern Europe, northern Africa, the Caucasus and the Levant unlike the most other *Asphodeline* species which are endemic to Turkey.

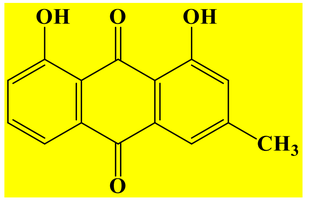



The good nutritional value of its leaves and seeds due to the presence of specific polyphenols, proteins and fatty acids was evaluated. The Nutritional parameters such as amino acid score (chemical score), protein efficiency ratio (PER) and predicted biological value (BV) were high and above those reported for the seed proteins of other Mediterranean edible plants.

The antioxidant, anti-cholinesterase, antityrosinase, anti-amylase, anti-glycosidase activity and anti-proliferative effect towards MCF-7 and MCF-10A cell lines of *A. lutea* alcoholic root extracts were proved. Moreover, these extracts revealed remarkable anti-MRSA activity against MRSA strains isolated from infections and demonstrated strong anti-mutagenic activity against known mutagens.

The biologically active compounds were characterized using different chromatographic and spectroscopic methods. The main groups of secondary metabolites with promising biological action are anthraquinones, flavonoids, phenolic acids and benzene/naphthalenes. The principle polyphenols were analyzed qulitively via UHPLC-MS/MS method. Their quantification was achieved using HPLC-DAD, HPLC-UV and UV-spectrophotometry.

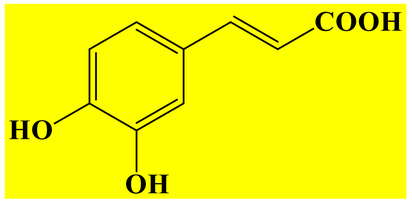
The HPLC-UV analysis of the main compounds – anthraquinones and naphthalenes in *A. lutea* roots from Bulgarian and Turkish origin showed that the naphthalene derivative (2-acetyl-1,8-dimethoxy-3 methylnaphthalene) was the major compound in Bulgarian accession, while caffeic acid was the main analyte in Turkish sample .





Caffeic acid and 2-acetyl-1,8-dimethoxy-3-methylnaphthalene isolated from *A. lutea* roots revealed cytoprotective and antioxidant activity similar to those of silymarin.

2-acetyl-1,8-dimethoxy-3-methylnaphthalene



Caffeic acid

NB! The chemical profile is close to those of anthraquinones containing medicinally important Aloe, Cassia and Rheum species.

Conclusions

All these findings highlight *A.lutea* plant as a new source of bioactive molecules and its possible application as functional food and drug formulations. In the future, nutrition experts could be including the species in their dietary patterns as food that double as medicine.

References

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