A093 *In vitro* techniques for the screening of plants for potential natural antioxidants

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In this study the antioxidant properties of different *Mentha* species, hybrids, varieties and cultivars were assessed. Although there are numerous procedures available, the deodourised water-soluble freeze-dried extracts from the dried plants were screened using four methods: ferric to ferrous reduction (RRE), ferrous ion chelation (Fe^{2+} chelation), 1,1-diphenyl-2-picryl-hydrazyl ($DPPH^{\cdot}$) radical scavenging and non-enzymatic liposome phospholipid peroxidation technique ($^{\cdot}OH$ method). The total phenolic content (GAE = Gallic Acid Equivalent) of each extract was estimated using the Folin-Ciocalteu reagent.
According to the results obtained by the RRE method, *Mentha* extracts are electron-donating and are able to convert free radicals into more stable non-radical products. *Mentha* extracts may be able to offer protection against oxidative damage by removing ferric ions (Fe^{2+} chelation). The extracts are also able to scavenge free radicals ($DPPH^{\cdot}$) and to prevent the peroxidation of phospholipid liposomes ($^{\cdot}OH$ method).
There was a highly significant correlation between the total phenolic content of the extracts and the capacity to reduce ferric to ferrous ions ($r = 0.897$, $p < 0.001$) and the scavenging capacity of free radicals ($r = 0.950$, $p < 0.001$). There was also a high correlation between the ferric to ferrous reduction and the $DPPH^{\cdot}$-scavenging methods ($r = 0.976$, $p < 0.001$). However, there was no correlation between the total phenolic content and the antioxidative properties in the Fe^{2+}-chelation method. The results obtained with this method differed from results obtained by the other methods.

A094 *Angelica archangelica* L. root extracts as inhibitors of xanthine oxidase and scavenger of superoxide anion radical

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The roots of *Angelica archangelica* L. (Apiaceae) are mainly used in loss of appetite, peptic disorders, spasmolytic or as antimicrobially active carminative (1). While the chemistry is well documented, there are limited reports on its pharmacological and biological properties (2).
The roots of *A. archangelica* were extracted with 80% aq. ethanol solution (AI), and after evaporation of the solvent, the slurry water extract was submitted to liquid-liquid partition in petrolether (AII), chloroform (AIII), ethylacetate (AIV) and n-buthanol (AV). The obtained extracts were investigated on xanthine oxidase (XOD) inhibitory activity and superoxide radical ($O2^{\cdot-}$) scavenger capacity, spectrophotometrically according to the procedure described by Berghe (3).
The crude extract (AI) was active only as a scavenger of $O2^{\cdot-}$, with an IC_{50} value of 2.01 mg/ml, showing no inhibitory effect on XOD in the tested concentration range. On the other hand, the chloroform extract (AIII) exhibited both the highest $O2^{\cdot-}$ scavenger capacity ($IC_{50} = 3.08 \times 10^{-1}$ mg/ml) and XOD inhibitory activity ($IC_{50} = 4.25 \times 10^{-1}$ mg/ml). Considerable strong scavenger and XOD inhibitory activities were found also for the ethylacetate extract (AIV).
These findings indicate the presence of biological active constituents in the roots of A. archangelica capable to inhibit XOD with the additional $O2^{\cdot-}$ scavenger activity.

References: 1. Wichtl M. (1994). Herbal Drugs and Phytopharmaceuticals. Scientific Publishers. Stuttgart. **2.** Newal A. C. et al. (1996). Herbal Medicines. The Pharmaceutical Press. London. **3.** Berghe D. (1998). J. Nat. Prod. 61: 71-76.