

BIOLOGICAL ACTIVITY OF BERGAMOT PEEL EXTRACTS (*Citrus bergamia* Risso)

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Bergamot peel (*Citrus bergamia* Risso) is an underutilized byproduct of the essential oil and juice-processing industry. As with other Citrus peels, it still contains exploitable components, such as pectins and flavonoids. Aim of this study was to investigate the biological properties of two different bergamot peel alcoholic extracts rich in flavonoids (especially flavanone glycosides and lower amounts of flavone di-*C*-glucosides and flavone di-*O*-glucosides; 1) and free of psoralens.

Besides to be endowed with a good antioxidant activity (evaluated by means of the DPPH test), both the extracts show to possess a strong protective *in vitro* effect against the well known mutagen 4-nitroquinoline-1-oxide in the SOS Chromotest on the *Escherichia coli* PQ37 strain (2); the antigenotoxic activity was maintained also in presence of S9 metabolic activation system. Chromatographic analysis, after treatment with S9 fraction, demonstrated that the extracts were not biotransformed. Furthermore, the extracts had no mutagen activity on *Escherichia coli* PQ37 strain (neither in presence of S9 metabolic activation system). However, the extracts had no antibiotic activity on several Gram⁻ and Gram⁺ strains. Finally, these extracts were also capable to modulate the cellular redox status (evaluated by determination of GSH, GSSG, MDA/HNE and superoxide dismutase levels) induced, *in vitro*, from TNF-alpha in human umbilical vein endothelial cells (HUVEC).

One can speculate that all these bioactivities of the extracts under investigation are related to the antioxidant/radical scavenger properties of flavonoids contained in them. In conclusion, our results suggest a possible use of bergamot peels to obtain extracts rich in flavonoids for phytopharmaceutical applications and as natural additives for functional foods.

REFERENCES:

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