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Poster Abstract – H.05

ISOLATION OF A FLAVONOID 3'- HYDROXYLASE SEQUENCE PUTATIVELY INVOLVED IN LUTEOLIN BIOSYNTHESIS IN GLOBE ARTICHOKE

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Globe artichoke (C*ynara cardunculus* var. *scolymus* L.) has been known since ancient times for its therapeutical effects against dyspeptic disorders. Leaf extracts have been demonstrated to possess a strong choleretic and hepatoprotective activity, the capability for inhibiting cholesterol biosynthesis and LDL oxidation, promoting blood circulation and mobilising energy reserves as well as significant antibacterial, antifungal and antioxidant properties. The above beneficial properties depend mainly on the wealth of polyphenolic compounds produced through secondary metabolism, among which the flavonoid luteolin has been found to be a powerful antioxidant and to significantly inhibit cholesterol biosynthesis. The aim of this work was to identify tissues and genotypes with an higher content of luteolin and to isolate and characterise the key gene(s) for its biosynthesis in artichoke.

Luteolin content was analysed by HPLC in different parts of the artichoke heads and in the leaves, and found to be higher in outer and intermediate bracts, while receptacles, inner bracts and leaves contained a lower level of the flavonoid. Luteolin biosynthetic pathway has been elucidated in Arabidopsis and other species and found to be catalysed by the enzymes flavonoid 3'-hydroxylase (F3'H) and flavone synthase II (FNSII). F3'H encoding genes have been cloned in several species, including *A. thaliana, Matthiola incana, Callistephus chinensis* and *Petunia* x *hybrida*. Degenerated primers were designed on conserved domains of known *F3'H* genes and used for PCR amplification of artichoke cDNA. The amplified fragment was extended via 5'-3' RACE and confirmed to be a *F3'H* gene by homology search in GeneBank. Expression levels of the *F3'H* gene were investigated in bracts and leaves of several artichoke local and commercial varieties and found to be higher in the intermediate bracts than in the leaves of all tested genotypes, indicating that accumulation of high levels of luteolin in intermediate bracts is not dependent on transcriptional regulation of the *F3'H* gene.

Further analysis are required to demonstrate whether F3'H is actually involved in luteolin biosynthesis in artichoke.