

α -TOMATINE CONTENT IN *SOLANUM* SPECIES AND CYCLOARTENOL-SYNTASE (*CASI*) GENE EXPRESSION

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Tomatoes contain tomatine, a steroidal saponin, constituted of a tetrasaccharide group attached to the aglycone tomatidine. This compound acts *in planta* as a phytoanticipin against fungi, bacteria and insects. Moreover it shows interesting pharmacological properties including antibacterial, antifungal, antiviral, antitumoral and anticholesterolemic activity. As concerning the latter property, it is reported that hamsters fed with tomatine exhibited a reduction of plasma LDL cholesterol. All organs of tomato plant contain tomatine which in immature green tomatoes accumulates up to 500 mg/kg of fresh fruit weight. Tomatine is largely degraded as the tomato ripens until, at maturity, it reaches levels in red fruits of about 5 mg/kg of fresh weight.

In this work, tomatine content of different organs was evaluated in cultivated tomatoes as well as in five wild tomato species by a *Trichoderma viride* bioassay. This fungus is a saprotrophic organism which showed a dose-dependent dropping in colony diameter related to the concentrations of saponins in the medium. All crude extracts from different organs significantly inhibited the growth of *Trichoderma viride*, except leaves and roots of *Solanum lycopersicum* and roots of *S. chmielewskii*. In particular the growth of *Trichoderma viride* was strongly inhibited by flowers' extract extract of *Solanum lycopersicum* and *Solanum chmielewskii*, leaf extract of *Solanum pimpinellifolium* and root extract of *Solanum peruvianum*.

Since a starting point of tomatine biosynthesis is considered to be the general pathway of steroid biosynthesis, molecular cloning of the cycloartenol synthase gene (*CASI*) was pursued in *S. lycopersicum* by homology-based PCR method. The comparative analysis of full-length cDNA, using the BLASTX algorithm, showed that *CASI* sequence was closely related to other plant cycloartenol synthases, and in particular, a high degree of identity (79%) was observed with cycloartenol synthase of *Panax ginseng*.

To study differential gene expression of *CASI*, RT-PCR was performed in different organs of some the tomato species and results will be discussed. Other genes involved in anabolism and catabolism of α -tomatine are being investigated by means of similar cloning strategies.