

**BBI AND KUNITZ SERIN-PROTEINASE INHIBITOR ACTION IN TOMATO
TRANSGENIC PLANTS TOWARDS *HELICOVERPA ARMIGERA* LARVAE.**

Riccardo Caccia*, Maria Schettino, Francesca Farisei, Federica Savazzini, Elia Poerio, Stefano Speranza, Claudio Pucci, Gian Piero Soressi. **Dipartimento Agrobiologia e Agrochimica, Sez. Genetica Università della Tuscia, Via S. Camillo de' Lellis 01100 Viterbo, Italy. Fax +39.0761.357242; e-mail: soressi@unitus.it*

Several crop varieties with agronomically-compatible levels of resistance to insects have been generated by *Bt* gene transfer. Plant proteinaceous proteinase inhibitors have potential for increasing resistance of crop to insect pests. Proteolytic activities in the larval guts of *Helicoverpa armigera* (a major pest of solanaceae) have been investigated and proved to be largely due to extracellular serine proteinases (trypsin- and chymotrypsin-like activities) with alkaline pH optimum. With the aim of obtaining tomato transgenic plants resistant to *H. armigera* larvae, we transformed the cultivar Riogrande with the gene *KTI3* (coding for a soybean Kunitz Inhibitor) and the cultivar UC-82 with the gene *Pi-IV* (coding for a soybean Bowman-Birk Inhibitor).

Leaf extracts of transgenic plants contained significant levels of inhibitory activities towards both bovine pancreatic trypsin and insect trypsin-like enzyme, on average 187- and 5-fold higher than controls, respectively. The trypsin inhibiting activity was found stable at different plant phenological phases in fruits and leaves; this activity resulted stable for 24h in detached leaf discs used to feed insects. Both inhibiting activities were able to contrast development of *H. armigera* larvae, by interfering with midgut trypsin-like activity that was found higher in III-IV ages than other ages.

S.I.G.A.

**SOCIETÀ ITALIANA
DI GENETICA AGRARIA
Gruppi di Studio
“ Resistenza a malattie e
OGM”**



Società Italiana di Patologia
Vegetale – S.I.Pa.V.



Università degli Studi della
Tuscia

ATTI

WORKSHOP

**Resistenza durevole a stress biotici nelle piante:
contributo delle biotecnologie**

**Aula Magna Facoltà di Lingue - Via S. Camillo de Lellis
Università degli Studi della Tuscia, Viterbo
20 -21 maggio 1999**