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Poster Abstract – F.14

TOWARDS PRODUCTION OF SAPONINS IN CALLUS AND CELL CULTURES IN *SOLANUM* AND *ASTER*

I. CARUSO*, E. LOTTI**, P. CHIAIESE*, R. FASANO**, A. ERRICO*

*) Department of Soil, Plant and Environmental Sciences, University of Naples "Federico II", Via Università 100, 80055 Portici, Italy
**) Institute of Plant Genetics – CNR, Research Division Portici

Solanum lycopersicum, Aster sedifolius, Aster caucasicus

Plants are able to synthesize a wide range of molecules potentially useful to control phytopathogenic organisms, such as virus, bacteria, fungi and insects. The use of natural compounds to control biotic agents in agriculture is of much interest for safety and ecological reasons. Species belonging to the genus *Solanum* (fam. *Solanaceae*) and *Aster* (fam. *Asteraceae*) produce high levels of steroidal and triterpenoid saponins respectively, that show biological activities. The synthesis of these molecules in plants is dependent on environmental conditions or a particular growth stage of the plant. Plant cell culture is an alternative and renewable source of secondary metabolites and could supply the production of, bioactive secondary metabolites on industrial scale. The main goal of this study is to obtain production of saponins from callus and cell cultures of *S. lycopersicum*, *A. sedifolius* and *A. caucasicus.* In order to obtain *in vitro* cultures of the three species here reported, we started to set up optimal conditions for callus and cell production. Three types of explants such as leaf, petiole and root were assayed in Murashige and Skoog solid medium containing vitamins and supplemented with sucrose and with several different combinations of hormones 2,4-dichlorophenoxy acetic acid (2,4-D) and 6-benzylaminopurine (BAP). Leaves were the best source of explants for obtaining a callus culture in *S. lycopersicum* on MS medium supplemented with 2,4D plus BAP. Furthermore, based on weight increase, leaf explants performed better under the light than under the darkness. In *A. caucasicus*, high callus production was successfully induced only in petiole explants collected from *in vivo* plants. Callus growth was greater on MS supplemented with 2,4D than in other tested media and it was not affected by light. Conversely, in *A. sedifolius* leaf explants from plants grown *in vivo* produce callus on MS medium supplemented with 2,4-D and BAP. As concerning callus induced under the light, a large variability has been detected for colour and types (compact or friable) of the calli. Cell cultures were established by subculturing friable calli for each species into the optimal medium tested for callus production.

Calli and cells in different growth stages, exponential growth phase, linear phase and stationary phase will be assessed by molecular and biochemical analysis to evaluate the production of saponins.