Cloning Tamarillo (*Solanum betaceum*) through somatic embryogenesis: practical applications and molecular analysis

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Tamarillo is a solanaceous tree species that produces edible fruits much appreciated in some countries. In the last years, several methods for *in vitro* cloning of *Solanum betaceum* Cav. have been developed, including somatic embryogenesis. A diversity of explants can be used to induce embryogenic development. However, young leaves have proven to be quite effective. Based on this system, cloning of several genotypes of tamarillo has been achieved and plants tested in the field. Moreover, cytological, physiological, genetic and biochemical analysis have been used to better understand the mechanisms controlling the acquisition of embryogenic competence as well as somatic embryo development and germination. The last results concerning this embryogenic system will be presented and discussed.

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Parole chiave: Tamarillo, embryogenic competence, embryo development, embryo germination.

Adventitious shoot organogenesis from leaf and petiole explants of european hazelnut

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Adventitious shoot organogenesis and somatic embryogenesis are the basis for implementing new genetic variability and biotechnological approaches in woody species, particularly if mature tissues from valuable cultivars are used. To date, these technologies are only applied to few tree species due to the absence of efficient regeneration protocols. In hazelnut, adventitious shoot organogenesis and somatic embryogenesis have only been carried out with zygotic embryo tissues up to now. Here we report plant regeneration from explants of somatic origin by using *in vitro* rejuvenated mature tissues (leaves, petioles and stipules). A histological analysis carried out on calli grown on various media, showed significant evidence of shoot regeneration, as proved by the presence of vascular elements such as tracheids with annular or helical secondary wall thickening. Subsequently, the optimization of the regeneration protocol performed by pre-treating the explants with antibiotics (carbenicillin, vancomycin, and cefotaxime) as molecules with auxin-like effects enabled us to achieve shoot organogenesis in hazelnut. The organogenic competence strictly depended on the explants and antibiotics used in the experiments. Following an antibiotic pre-treatment of cv Tonda Gentile Romana explants in the proliferation stage, organogenic responses (frequencies of 40%) were obtained. According to the results obtained, the best protocol for inducing shoot organogenesis in hazelnut should include the use of explants (leaves and petioles) conditioned in a double-liquid layer of cefotaxime 1000 mgL^{-1} added to the proliferation medium, cultured on the induction medium, consisting in solid MS medium supplemented with 3% sucrose, 6-benzylaminopurine 1 mgL^{-1}, indole-3-butyric acid 1 mg L^{-1} and kinetin 2 mgL^{-1}, and then by subculturing the newly-formed calli to regeneration medium, consisting of half-strength solid MS medium with sucrose (30 gL^{-1}) and 6-benzylaminopurine (0.5 mgL^{-1}).

Key words: *Corylus avellana* L., shoot regeneration, rejuvenation, histological analysis, antibiotics.

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