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Efficiency of Different Culture Mediums and Explant Types of some *Citrus* Rootstocks on Somatic Embryogenesis

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Callus induction, somatic embryogenesis and plant regeneration were obtained in ten different *Citrus* genotypes [*Citrus aurantium* L. (cv 'Tuzcu 891'), *Citrus aurantium* L. (cv 'Tuzcu 31-31'), *Citrus aurantium* L. (cv 'Gou Tou'), *Citrus sinensis* (L.) Osb. (cv 'Alanya Dilimli'), *Citrus reshni* Hort. ex.Tan. (cv 'Cyprus Cleopatra mandarine'), *Poncirus trifoliata* (L) Raf (cv 'Pomeroy'), *Citrus sinensis* (L) Osb. x *Poncirus trifoliata* (L) Raf. (cv 'Tuzcu M2 Citrange'), *Citrus sinensis* (L) Osb. x *Poncirus trifoliata* (L) Raf. (cv 'Carrizo Citrange'), *Citrus paradisi* Macf. x *Poncirus trifoliata* (L) Raf. (cv 'Swingle Citrumelo), *Citrus volkameriana* Tan.& Pasg. (cv 'CRC 01 Volkameriana') from style and ovule explants. Explants were cultured on different culture media. The nutrients of Murashige and Skoog medium (MS) and Murashige and Tucker (MT) vitamins supplemented with 500 mg/l Malt Extract (ME), with 1 mg/l 2, 4-D and three different concentration of BA (0, 0.5, 1 mg/l) were used for first year experiments. MS basal medium was used alone with ME and three different concentration of BA (1, 2, 3 mg/l) for style explants for the second year experiment. MS nutrients and MT vitamins with ME were used alone and 2, 4-D (1 mg/l) and BA (0, 0.5, 1 mg/l) used for ovule culture experiment for the second year experiments. Sucrose was used as a carbon source (50 g/l) for all experiments. The different genotypes showed different embryogenic frequency from style and ovule experiments. Percentages of style explants producing somatic embryos ranged from 0% (AREC Swingle Citrumelo, M2 Citrange, Volkameriana, Pomeroy trifoliata) to 100% (Gou Tou Sour Orange). Percentages of ovule explants producing somatic embryos ranged from 0% (Carrizo Citrange, Alanya Dilimli Sweet Orange, AREC Swingle Citrumelo) to 100% (Tuzcu 891 and Cleopatra Mandarine). About 4 weeks later somatic embryos developed into plantlets. Genetic stability of callus lines was determined by SSR markers.

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A Consensus map Constructed with SSR and EST-SSR Markers Using Progeny Population from Sweet orange × tangor

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A consensus linkage map was constructed with a population of 68 progenies from Li 2 (sweet orange, *Citrus sinensis* (L.) Osb.) × Wan 2 (tangor, *C. unshiu* (Mark.) Marc. × *C. sinensis* (L.) Osb.). SSR and EST-SSR primers publicly available, together with EST-SSR newly generated in Citrus Research Institute, CAAS and Southwest University, were screened and used in the map construction. Mapping software JoinMap 3.0 was used for linkage analysis. In the Cross Pollinator (CP) mode with a LOD score at 3.0~5.0, 11 linkage groups were constructed. Of the 118 markers integrated, 60 were EST-SSR and 58 were SSR. The map covered 661 cM of the citrus genome. SSR and EST-SSR markers are evenly distributed among all linkage groups in general. Through comparison of a set of shared markers, six linkage groups were found to be co-linear with those in the newly published EST-SSR linkage map of Chen (2008). The results represent the first citrus extensive map which contains both SSR and EST-SSR markers built on a scion breeding group.

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Impact of a New Nucleo-cytoplasmic Composition on the Citrus Fruit Quality

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Organic acids, sugars and carotenoids are implied in the fruit quality. A cybrid has been obtained by symmetric protoplast fusion between Willow leaf mandarin (*Citrus deliciosa* Ten.) and Eureka lemon (*Citrus limon* (L.) Burm.). The cybrid possessed nuclear genome and chloroplasts of Eureka lemon plus mitochondria from Willow leaf mandarin. Impact of new mitochondria on the internal fruit quality has been studied. Organic acids, sugars and carotenoids were quantified by HPLC on fruit pulp of Willow leaf mandarin, Eureka lemon and the cybrid. Compounds identified in cybrid fruit pulp were compared