Journal of Plant Genetics and Breeding

Montecinos, J Plant Genet Breed 2022, 6:3

Short Communication Open Access

Micropropagation Aids Reintroduction of an Apulian Artichoke Landrace in Long-Term Cropping

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Short Communication

The medicinal benefits of *Curcuma longa (C. longa)* are well established. However, overexploitation of this plant in Rapa Nui raises concerns about its long-term survival. Micropropagation with a temporary immersion system (TIS) could be the foundation for constructing a cost-effective and high-yielding large-scale culture approach for this plant. Our goal was to improve the in vitro multiplication method for mass propagation of *C. longa* and thereby aid in the restoration of Rapa Nui's endangered environment. The number of explants per flask, flask capacity, and LED spectrum were all tested. Fresh weight per plant, number of shoots, proportion of non-sprouting explants, and proliferation rate were all investigated for each parameter. When 30 explants per two-liter flask are used, more plants with high fresh biomass are produced than when other configurations are used. Furthermore, LEDs with a red:blue ratio of 2:1 gave the optimal lighting conditions for in vitro multiplication and influenced *C. longa* proliferation and rooting positively. As a result of our findings, we may obtain a greater number of *C. longa* plants utilising TIS by using 30 explants per two-litre flask and an LED source with a red:blue ratio of 2:1 [1].

Because the population of Croatian autochthonous cultivars is highly infected with economically relevant viruses, viral eradication is required in particular cultivars in order to produce healthy planting material. We examined in vitro meristem culture establishment on 18 autochthonous cultivars with various viral infections, as well as the feasibility of GLRaV-3 eradication using in vitro meristem culture, in this study. Plant material was collected in a vineyard at two different phenological stages: 10 days before flowering and 10 days after flowering. The survival, regeneration, and rooting of apical meristem explants (1 mm) were examined in MS culture media supplemented with 0.5 mg/L benzyl adenine (BA) and 0.05 mg/L indol-3-acetic acid (IAA) [2]. The findings revealed that the cultivar and growth phase had a substantial impact on in vitro culture success. Explants sampled after flowering had a greater success rate of in vitro culture establishment metrics (survival, regeneration, and roots) in all cultivars investigated, with the exception of one cultivar for explant survival. Genotypes infected with three viruses (GLRaV-1, GLRaV-3, and GFLV) performed better than genotypes infected with one or two viruses, contrary to predictions. In vitro establishment of a Croatian autochthonous cultivar was effective, as was GRLaV-3 eradication in one cultivar. However, because of the large effect of cultivar, more research is needed before this in vitro approach may be used routinely on more than 100 autochthonous cultivars in need of cleanliness [3].

The artichoke (*Cynara cardunculus L.* var. *scolymus (L.) Fiori*) is a Mediterranean perennial plant of the Asteraceae family. Although Italy has a diverse artichoke biodiversity, many landraces are facing genetic degradation as commercial types become more homogeneous in production. In vitro, the Apulian landrace 'Troianella' was created to valorize and supply high-quality material for propagation in nurseries and, later, cultivation in producing fields. -6-benzylamminopurine (BAP-0.05 mg L^{-1}) was added to four different growth media to measure shoot proliferation. The highest results were obtained on MS519-A and BM media, which included additional dosages of $CaCl_2$ and $MgSO_4$ (added 120 mg L^{-1} and 190 mg L^{-1}, respectively) in addition to MS macronutrients [4]. With 10 mg L^{-1} of Indole-3-acetic acid (IAA) and 30 g L^{-1} of sucrose, root induction was achieved in vitro. Plants produced from tissue culture were acclimatised in a greenhouse employing mycorrhizal symbiosis to boost their survival throughout the acclimatisation phase and after transplanting in the field. Three arbuscular mycorrhizal (AM) fungi were put to a sterile substrate (*Septoglomus viscosum*, *Funelliformis mosseae*, and *Symbivit*, a commercial combination) and compared to a sterile control without any AM fungal inocula. After three months, the substrates containing *S. viscosum* fungus or the commercial mycorrhizal fungi mix produced the best growth and plant look. The findings aided in the establishment of an efficient micropropagation strategy and the manufacture of high-quality plant material for the endangered 'Troianella' landrace's sustainable farming [5].

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Received: 10-May-2022, Manuscript No. JPGB-22-64447; **Editor assigned:** 12-May-2022, PreQC No. JPGB-22-64447(PQ); **Reviewed:** 20-May-2022, QC No. JPGB-22-64447; **Revised:** 24-May-2022, Manuscript No. JPGB-22-64447(R); **Published:** 27-May-2022, DOI: 10.4172/jpgb.1000121

Citation: Montecinos M (2022) Micropropagation Aids Reintroduction of an Apulian Artichoke Landrace in Long-Term Cropping. J Plant Genet Breed 6: 121.