

cuttings were taken for rooting. Petiole sap nitrate was measured with a specific ion meter (Cardy) to correlate real-time nitrogen status to cutting yield and subsequent root growth. These measurements in turn were correlated with those obtained via capillary electrophoresis. For the taxa studied, overall performance of stock plants and cuttings including rooting percentage and root surface area and volume was optimized with the 100 and 150 mg·L⁻¹ N treatments. Little benefit was obtained from the higher rates, but the 50 mg·L⁻¹ N treatment produced the lowest number of potential cuttings across all taxa.

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(269) Rapidly Screening Plant Species for Phytoremediation through Suspension Culture

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Increasing interest in using phytoremediation to detoxify water and soil is producing demand for identifying approaches that can rapidly select plant species that will effectively capture and remove contaminants. Plant suspension culture is a branch of plant tissue culture which is a special vegetative propagation method that satisfies this need. This pilot study combined plant suspension culture and phytoremediation using guava and other plant tissues in a plant bioreactor to investigate effectiveness of extracting and hyper-accumulating phosphorus. We observed a significant reduction of phosphorus on day 3 and by the end of the third week an 80% reduction of phosphorus was recorded. We also observed that the pollutant aggregation process not only involve the plants' root systems, but other tissues and organs too. This indicates that future development of plants for accumulation of elemental pollutants should focus not only on root systems, but other parts of the plant as well. The findings also suggest that suspension culture may be a very effective way for rapidly screening plants that can be used to remove undesired substances from soil and/or water systems.

(270) Cutting Propagation of Wild *Rhododendron decorum* Franch.

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Dabai rhodo (*Rhododendron decorum* Franch.) is one of dominant species in mountainous Guizhou, China, especially in the one-hundred miles of natural *Rhododendron* communities. To introduce this natural treasure to our daily cultivation, two types of cuttings were collected from its wild populations and treated with hormones. Semi-hardwood cuttings with heel produced roots while semi-hardwood cuttings without heel did not survive at all. Hormone type had significantly affected on rooting of dabai rhodo. Dip'N Grow was better and to produce roots

at 44 days (74 days for CK) with 53.2% rooting rate (1.12% for CK). Hormodin, straight IBA, NAA, and other yielded 3.9 to 22.6% rooting rates. The quick-dip Dip'N Grow concentration should be 1:10 (1,000 mg·L⁻¹ IBA + 500 mg·L⁻¹ NAA) and higher or lower concentrations would significantly reduce the rooting ability of dabai rhodo. The quality of root, which measured by the total roots and the longest root length, followed the trend of the rooting rates. Cuttings treated with Dip'N Grow at 1:10 ratio produced 45 roots per cutting with the longest root of 8.1 cm. *Rh. Decorum* could be reproduced using semi-hardwood cuttings with heel, quickly dipping into the 1:10 Dip'N Grow for 5-10 seconds, and rooting with perlite and peat moss media. Donglin Zhang is a guest professor at the Central South University of Forestry and Technology.

(271) Rooting and Acclimatization of Bunchberry In Vitro-Derived Propagules

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This study evaluated the effects of nutrient salt formulations combined with auxin concentrations on subsequent in vitro adventitious root proliferation and the effects of different greenhouse propagation media combined with ex vitro auxin concentrations for acclimatization of bunchberry (*Cornus canadensis* L.). A factorial combination of nutrient salt formulations (MS, LP, and ½ Macro MS) ranging from high to low salt concentrations and auxin, indole-3-butyric acid potassium salt (0, 5, 10 μM IBA), concentration were evaluated to determine a suitable medium for in vitro adventitious root proliferation. Stage II multiplication propagules (callus-derived with average of 3 adventitious shoots) were transferred to the in vitro rooting factorial treatments. Rooting data was collected at 4 and 8 weeks after transfer to rooting media treatments. There were no significant factorial combination with respect to in vitro rooting. The presence of indole-3-butyric acid potassium salt in the medium did have a significant effect on root number with 10 μM IBA having the highest success with adventitious root proliferation as compared to 0 and 5 μM IBA. A factorial combination of greenhouse propagation media (perlite, fine grade vermiculite, and peatlite growing mix) and ex vitro rooting hormone concentrations (100% Talc, 0.1, and 0.3% IBA) were evaluated to determine a suitable ex vitro rooting and acclimatization protocol. Stage II multiplication propagules, as previously described, were transferred to the ex vitro rooting/acclimatization factorial treatments. Propagules were placed in cell packs (37 mm² × 65 mm) and were placed under intermittent mist (mist interval of 6 s every 6 min) within a glass-covered greenhouse under natural photoperiod. Data was taken on survival and root number 4 weeks after transfer to rooting/acclimatization treatments. There were no significant factorial combination with respect to ex vitro adventitious root proliferation and plantlet survival based on acclimatization. Treatments affecting acclimatization survivability were not significantly different. The higher level of auxin, 0.3% was inhibitory to ex vitro root proliferation. There were no differences with respect to root proliferation with 100% talc and 0.1% IBA. Propagules growing in fine grade vermiculite had significantly fewer adventitious roots as compared to perlite and peatlite media. In conclusion, bunchberry has shown successful adventitious in vitro root proliferation with the addition of 10 μM IBA to the nutrient salt medium. Ex vitro adventitious rooting and acclimatization were successful achieved with the use of perlite or peatlite greenhouse propagation medium and 100% talc or 0.1% IBA supplemented at time of transplanting.

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