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*Dendranthema* species and  $F_1$  hybrids from the different habitats in Korea were collected to investigate the variation of their somatic chromosomes. The results in this study revealed series of polyploidy in *Dendranthema* from diploids ( $2n=2x=18$ ) up to octoploids ( $2n=8x=72$ ) with the basic chromosome number  $x=9$ . Some of the  $F_1$  hybrids have also intraspecific polyploids as well as aneuploids. Due to *Dendranthema* has shown to comprise series of polyploidy ( $2x$ ,  $4x$ ,  $6x$ ,  $8x$ ), it was possible that polyploidy ( $2x$ ,  $4x$ ,  $5x$ ,  $6x$ ) individuals also produced in  $F_1$  hybrid progeny. Mostly the range of variation was found as diploid ( $2n=2x=18$ ) individuals with *D. boreale*, *D. makinoi* and *D. lineare*, irrespective of whether they occurred together with tetraploid ( $2n=4x=36$ ) of *D. indicum*, *D. zawadskii* ssp. *lucidum*, *D. zawadskii* ssp. *latilobum* var. *leiophyllum*, *D. japonicum*, and hexaploid ( $2n=6x=54$ ) of *D. indicum* for. *albescens*, *D. zawadskii* ssp. *acutilobum*, *D. zawadskii* ssp. *acutilobum* var. *tenuisectum*, *D. zawadskii* ssp. *acutilobum* var. *alpinum*, *D. zawadskii* ssp. *naktongense*, *D. zawadskii* ssp. *yezoense*, *D. zawadskii* ssp. *latilobum* and octoploids ( $2n=8x=72$ ) of *D. zawadskii* ssp. *coreanum*. Number of chromosomes in different species suggests that the hybridization between individuals had repeatedly occurred not only in *D. zawadskii* complex, but also in *D. boreale* and *D. indicum*. As morphological characteristic, intermediate individuals between *D. zawadskii* complex and *D. indicum* suggests that the hybridization occurred with different species respectively. Artificial reciprocal crosses between *D. japonicum* ( $2n=36$ , tetraploid) and *D. indicum* for. *albescens* ( $2n=54$ , hexaploid) were made and produced  $F_1$  hybrid ( $2n=45$ , pentaploid). The cytogenetic investigation in *Dendranthema* has been largely directed to ascertain chromosome numbers and the descriptions of chromosome morphology.

2:45–3:00 pm

**In Vitro Propagation of *Colutea gifana*, an Endangered Species in Iran****Mahnaz Kiani\***Ornamental Plant Department, Research Center for Plant Sciences, Ferdowsi Univ of Mashhad, Mashhad;  
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In vitro methods provide a variety of tools to supplement traditional methods for collecting, propagating and preserving endangered plant species. In this study, an efficient protocol was developed for in vitro propagation of *Colutea gifana*, a rare and endangered plant species with limited reproductive capacity that grows in a very narrow area of Iran. Single nodes explants were used for a series of experiments to select appropriate disinfection method and growth regulators for establishment, proliferation and rooting stages. Explants showed the highest establishment percent after 15 min treatment with 2% sodium hypochlorite (NaOCl) cultured in MS medium plus  $2.2 \mu\text{M}$  6-benzylaminopurine (BAP) and  $1 \mu\text{M}$  indole-3-butyric acid (IBA). BA was more effective cytokinin in comparison to Thidiazuron (TDZ) and Kinitin (Kn) in proliferation stage and the best result was obtained with  $8.8 \mu\text{M}$  BA. *In vitro* rooting of proliferated shoots were induced in half-strength MS medium with both tested auxins i.e. IBA and  $\alpha$ -naphthaleneacetic acid (NAA). Eighty percent of the plantlets were successfully acclimatized to ex vitro conditions, exhibiting normal development. These plantlets can be used to replenish declining populations in the wild to conserve *C. gifana* from extinction and also for further studies about this species.

Thursday, August 5, 2010

Springs H &amp; I

**Oral Session 40:****Crop Physiology: Fruit Crops**

1:00–1:15 pm

**Cold Hardiness of Apple Rootstock Trunk and Root Tissues****Renae E. Moran**

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Ungrafted clonal apple rootstocks were stored at  $1^\circ\text{C}$  until controlled exposure of the trunk and shoots to  $-12$ ,  $-15$ ,  $-18$ ,  $-21$ ,  $-24$  and  $-27^\circ\text{C}$  in Dec. 2009. To protect roots from cold temperature injury, the roots were insulated by peat-based media inside a Styrofoam container. Temperature of the media remained above  $-1^\circ\text{C}$  during exposure to subzero temperatures. Internal browning of phloem, cambium and xylem was rated on a scale of