

controlled of 25 °C, 30 °C, 35 °C, alternated of 20-30 °C and 25-35 °C and with or without scarification) with 4 replications and 25 disseminules. In accordance with the treatment were made lateral scarifications in the disseminules by abrading the seed with sand paper, until the external appearance of endosperm. The disseminules with or without scarification were embedded in plastic boxes (gerbox), containing fine vermiculite. Daily, the number of disseminules that had showed primary root protrusion was counted, and when the germination stabilized, the percentage and the Germination Speed Index (GSI) were calculated. The analysis of variance (ANOVA) was made for comparing means employing Tukey's test, at 5% confidence level. It was concluded that the biggest germination's percentages were obtained in the 20-30 °C (62%) and 25-35 °C (59%) temperatures; the germination's percentage and GSI were similar for scarificated disseminules or not and seeds germinated faster over 20-30 °C.

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Seed Compounds Mobilization of *Anthurium affine* during Germination

Morais, E. B.¹; Gallão, M. I.²; Castro, A. C. R.¹

¹EMBRAPA AGROINDUSTRIA TROPICAL, RUA DRA SARA MESQUITA, 2270, 60511-110, FORTALEZA, CEARÁ, BRAZIL

²UNIVERSIDADE FEDERAL DO CEARÁ, BRAZIL

Anthurium affine is a native species from Brazilians semi-arid regions, often used for cut foliage and pot plant; it presents low water demanding and long durability after harvesting. In spite of great ornamental potential, its physiology is scarcely known. This work aims to morphologically characterize the mobilization of the seed storage of *A. affine* during germination. Seeds obtained from the Germoplasm Bank of Ornamentals Plants of The Brazilian Agricultural Research Corporation were disinfected with sodium hypochlorite 4%, for 15 minutes, washed and incubated in Petri dishes with moist filter paper. After 24 h of inoculation, samples were taken through 7 subsequent stages of development until the presence of primordial leaf, then transversally cut, fixed into Karnovsky, dehydrated through a growing ethanolic series, filled up with Historesin and cut using an automatic microtome. The slices obtained were stained with Toluidine Blue (TB) at pH 4 and Xylidine Ponceau (XP) at pH 2.5 and allowed to react with Periodic acid and Schiff (PAS). TB stained the cell wall due to the pectin presence, but there was no change in the staining intensity during germination. XP revealed the presence of protein globules in the cotyledon and endosperm cells. In the cotyledon, the drastic reduction in XP staining indicated consumption of protein reserves by the embryo during germination. The PAS reaction revealed the presence of granules in the cells of the cotyledon and endosperm. Through the Lugol method, it was confirmed the starch composition of the granules, which disappeared during germination. At the end of the study period, globules appeared in the periphery of the endosperm, which was associated with the onset of photosynthetic activity of seedlings. The seeds of *A. affine* have as main storage compound starch and protein.

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Pigmentation and Changes in Some Metabolites during Development of *Poinsettia (Euphorbia pulcherrima Willd)* in Two Locations

Garcia-Lopez, A. M.¹; Colinas-León, T. M.²; Alia-Tejagal, I.³; Legaria-Solano, J. P.²; Martinez-Damian, T. M.²

¹UNIVERSIDAD AUTONOMA DE BAJA CALIFORNIA, CARR. ADELTA S/N EJIDO NUEVO LEÓN, 21705, MEXICALI, BAJA CALIFORNIA, MEXICO

²UNIVERSIDAD AUTONOMA CHAPINGO, CARR. MEXICO-TEXCOCO KM. 38.5, CHAPINGO, MEXICO, CP 56230, MEXICO

³UNIVERSIDAD AUTONOMA DEL ESTADO DE MORELOS, MEXICO

In three cultivars of *Euphorbia pulcherrima* Willd: Freedom Marble, Supjibi and Gutbier V-17 Angelika, changes in pigmentation and some aspects of secondary metabolism were studied in two contrasting locations: Cuautla (subtropical condition) and Texcoco (temperate climate) under greenhouse conditions. This information can be useful to improve plant quality. Variables considered were: Total anthocyanins, Chlorophyll and carotenoid content, chlorophyll a/b ratio, specific leaf weight, leaf area, total phenols, and chalcone isomerase (CHI) activity. Significant differences were found for total anthocyanin content in the Supjibi cultivar.

Concentration of these pigments was higher for the three cultivars in Cuautla. This was also the case for chlorophyll, carotenoid, and chlorophyll a/b ratio. In the cultivars Supjibi and Gutbier V-17 Angelika significant differences were found in specific leaf weight comparing the two localities, presenting Texcoco the higher value, this was also the case for chalcone isomerase activity mainly in the Supjibi cultivar. In Cuautla a larger leaf area and higher phenolic content were observed.

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Investigation on Effect of High Level CO₂ Concentration on Anatomical and Morphological Traits in Floss Flower (*Ageratum houstonianum* L.)

Shoor, M.; Alizadeh, B.; Bostani, S.

FERDOWSI UNIVERSITY, AGRICULTURE FACULTY, HORTICULTURE DEPARTMENT, 9177948974, MASHHAD, ISLAMIC REPUBLIC OF IRAN

The floss flower (*Ageratum houstonianum* L.) is one of the most important ornamental plants, which used as edge plants in green space and parks. In this research effect of high level CO₂ concentration on anatomical, morphological and earliness traits of floss flower were investigated. CO₂ was used with concentrations 350 µL·L⁻¹ (control), 700, 1050, and 1400 µL·L⁻¹ CO₂. A completely randomized design (CRD) with 3 replications used and 14 traits were studied. Results indicated that the mean of stem diameter (%50) and plant height (2 times) increased in compared to control. Also the result showed with used of 1050 µL·L⁻¹ CO₂, The rate of chlorophyll increased (%41.7) in compared to control. Stomata density, width and size of stoma, stomata index, epidermal cells density, and width of cell guard of plants increased at high level of CO₂. Results indicated that with used of 700 µL·L⁻¹ CO₂, The flowering of plants accelerated 15 days than control.

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Effect of Kinetin and Benzylaminopurine on *in vitro* Shoot Multiplication of Carnation (*Dianthus caryophyllus* L.)

Kharrazi, M.¹; Nemati, H.¹; Tehranifar, A.¹; Bagheri, A.²; Sharifi, A.²

¹FERDOWSI UNIVERSITY OF MASHHAD, DEPARTMENT OF HORTICULTURE, COLLEGE OF AGRICULTURE, AZADI SQ., WAKILABAD AV., 9177511631, MASHHAD, KHORASAN, ISLAMIC REPUBLIC OF IRAN

²FERDOWSI UNIVERSITY OF MASHHAD, DEPARTMENT OF BIOTECHNOLOGY, COLLEGE OF AGRICULTURE, ISLAMIC REPUBLIC OF IRAN

³IRANIAN ACADEMIC CENTER FOR EDUCATION, CULTURE RESEARCH -BRANCH OF MASHHAD, ISLAMIC REPUBLIC OF IRAN

Carnation (*Dianthus caryophyllus* L.) is the third most important cut flowers in the world. Tissue culture techniques offer an efficient method for micropropagation of this ornamental plant. The object of this study was to evaluate the effect of kinetin (Kin) and benzylaminopurine (BAP), on shoot multiplication of four carnation cultivars (Prado Aquila Kgr, Skimo Mogr, Mondeo Kgr and Innove Orange Bogr). Explants from shoot tips and nodal segments were cultured on MS medium supplemented with different concentrations of BAP (1, 3, 6 and 12 mg/l) or Kin (1, 3, 6 and 12 mg/l) in combination with 0.5 mg/l NAA, 30 g/l sucrose and 9 g/l agar. For rooting of regenerated shoots, the effect of IAA, IBA and NAA (1,3 and 6 mg/l) in the same medium were evaluated. The cultures were maintained at a 16-h photoperiod and 25±2°C. The results indicated that there is a significant difference among cultivars in shoot regeneration, Mondeo Kgr and Eskimo with 6 and 4 shoots respectively were better than other cultivars (Prado Aquila Kgr and Innove Orange Bogr with 3 and 2 regenerated shoots, respectively). Effect of hormones indicated that high concentration of cytokinin increased the regenerated shoot number and hyperhydricity of them, but it decreased shoot length from 90 mm in medium containing 1 mg/l Kin to 30 mm in medium containing 12 mg/l BAP. Based on hyperhydricity percentage of regenerated shoots, there was a significant difference between cytokinins and cultivars. Mondeo Kgr and Prado Aquila Kgr had highest (70%) and lowest (20%) hyperhydricity, respectively and BAP caused more (80%) hyperhydricity than Kin (30%). In this investigation, the best medium for shoot multiplication and their rooting were MS medium containing 1 mg/l BAP in combination with 0.5 mg/l NAA and MS medium containing 3 mg/l IBA, respectively.