The Florida State Horticultural Society (FSHS) has a long and distinguished record of service to the horticultural industries of Florida. A very important contribution has been the evaluation of new selections of the many species of tropical, subtropical and temperate fruit which are grown in the state. This paper describes past activities and present measures to reactivate the Variety Committee of the Krome Memorial Institute.

History

Activities in evaluation and classification of fruit crops are recorded in the FSHS Proceedings from the beginning of the society. Vol. 1 (1888) discusses cooperation between the FSHS, the American Pomological Society, and other state horticultural societies. Vol. 2 (1889) describes exhibits of citrus fruits, rules for judging them, and the awarding of certificates and cash prizes for superior selections. Vols. 5 (1892) through 30 (1917) list the standing committees of the FSHS, including one on plant nomenclature and one on tropical fruits.

In Vol. 8 (1895) a detailed catalog of species and cultivars was published, in which the species were classified in 4 categories: citrus, deciduous, miscellaneous and tropical. This catalog was continued each year through Vol. 20 (1907), and still has value as a historical record of the development of fruit cultivation in Florida. Papers published in subsequent volumes of the Proceedings make it clear that interest in fruit production remained high. In 1933 the Krome Memorial Institute was formed, the first separate section of the FSHS. At first it dealt primarily with tropical fruit, but gradually it was expanded to include work on all fruit species other than citrus. A citrus section formed some years later.

Activities of the Variety Committee

The Krome Memorial Institute included a Variety Committee, which served several purposes. Information was recorded on new fruit selections, and a registry of cultivars was maintained. Evaluations of new selections were made, and the information was shared with members of FSHS and other organizations. Superior cultivars were described in detail, sometimes in separate papers and sometimes in reports of the Variety Committee. The reports were published as the need arose.

Eventually interest in the activities of the Variety Committee waned to the point that no new selections were being submitted for evaluation and registration. The most recent report of the committee was published in Vol. 71 (1958) of the Proceedings. Since that time various cultivar descriptions have been published, but there has been no official activity of the Variety Committee.

Discussion

Presently there is a need within the horticultural industry of Florida for a coordinated registry of tropical fruit cultivars. Many individuals and organizations are involved in some way in selection and propagation of new cultivars. There is little coordination of this effort, and often there is confusion about correct names and a lack of accurate information on their characteristics.

The Variety Committee of the Krome Memorial Institute is an appropriate group to coordinate the establishment of a registry of fruit cultivars for Florida. At the 1994 Krome Memorial Institute business meeting this matter was discussed, and those present agreed that the Variety Committee should be reactivated, with the establishment of a fruit cultivar registry as the main objective. Work has begun on this project, and it will be discussed further at the 1995 FSHS annual meeting. This effort will be valuable not only to FSHS members but to horticulturists everywhere. It will be coordinated with the Register of New Fruit and Nut Varieties of the American Society for Horticultural Science.

Proc. Fla. State Hort. Soc. 108:358-359. 1995.

SOMATIC EMBRYOGENESIS AND PLANT REGENERATION IN MUSCADINE GRAPE CULTIVAR TRIUMPH

X. Xu, J. Lu[1], O. Lamikanra, and L. Schell
Center for Viticultural Sciences
Florida A & M University
Tallahassee, FL 32307

Additional index words. Vitis rotundifolia.

Abstract. **Development of an appropriate in vitro culture and regeneration system is often an important step for micropropagation and gene transformation. Ovules of muscadine grape (*Vitis rotundifolia* Michx.) cultivar 'Triumph' were cultured on Emershad and Ramming (ER) medium. Callus was formed 2-3 weeks after initial culture. Of the ovules cultured, 69.4% produced embryogenic calli. Of these calli, 6.2% produced somatic embryos. Plants were regenerated from the somatic embryos after transfer to Woody Plant (WP) media.**

Somatic embryos are often used for micropropagation, synthetic seed technology and molecular studies (Gray and Purohit, 1991; Gray and Meredith, 1992). Grape somatic embryos have been produced from various explant tissues, including anthers (Mauro and Fallot, 1986), zygotic embryos (Gray, 1992; Emershad and Ramming, 1994), ovules (Emershad and Ramming, 1994), leaves and petioles (Cheng and Reisch, 1989; and Robacker, 1993). The most successful somatic embryogenesis system reported in grapes were involved in the bunch grape species *Vitis vinifera* L., *Vitis rupestris*

[1]to whom correspondence should be addressed.

Scheele and *Vitis longii* Prince, or their hybrids. This research was designed to initiate callus and somatic embryos from the muscadine cultivar 'Triumph' to establish a model system for high frequency somatic embryogenesis in muscadine grape.

Materials and Methods

Berries were harvested 6-8 weeks after open pollination, and sterilized with 70% alcohol for 3 min, 20% (v/v) Chlorox™ plus a drop of tween 20 for 15 min, and then rinsed 3-4 times with autoclaved deionized water. Ovules were removed from the berries and cultured on ER medium (Emershad and Ramming, 1994) supplemented with 6% sucrose, 0.3% charcoal and 0.7% Difco Bacto-agar (pH 6.0).

Cultures were maintained at 28°C with a 16/8 hr light/dark cycle. Callus was dissected from the surface of ovules and continually transferred to fresh medium every 4-6 weeks until embryos were formed. The somatic embryos were germinated on WP medium plus BA or maintained at 28°C with a 16/8 hr light/dark.

Results and Discussion

Callus induction. Callus was observed on ovules 2-3 weeks after culture. White, friable watery calli were commonly observed. Five weeks after they were cultured on ER medium, 69.4% ovules formed callus (Table 1). The somatic embryogenic calli derived from ovules were maintained on ER medium by subculture every 4 weeks.

Somatic embryogenesis. The white friable watery calli were removed from ovules 4-6 weeks after initial culture, and transferred to a fresh ER medium in a petri dish. Small globular structures became visible about 3 weeks after transfer. About 6% of the calli formed visible embryos in 4 weeks. More embryos were generated from these calli after a second or third transfer, 8-12 weeks after initial culture.

The somatic embryos were maintained on liquid and solid ER medium and transferred every 10-15 days for liquid culture or every 4-6 weeks for solid culture. Some somatic embryos continued to multiply as others developed into mature embryos with 2 cotyledons and a radicle. After almost two years from initial culture, the somatic embryos are still viable and regenerable.

Germination of somatic embryos. Somatic embryos germinated quickly after they were transferred on WP medium. Up to 25% of the somatic embryos germinated and formed plants on WP medium plus 5 µm BA (Table 2). The results indicated that 5 µm BA was better than 1 µm BA. Some somatic embryos tended to have wider hypocotyls and cotyledons and/or developed asynchronously. Faure et al. (1991) reported that abnormal growth and disorganized cell proliferation in somatic embryos of grape coincided with a high level of free polyamines and high putrescine/spermidine rates. Preliminary observation of plant regeneration from these embryo cultures indicated that the size of embryos is very important for germination and plantlet recovery. Only white torpedo stage embryos that were well polarized with a shoot axis, hypocotyl and two cotyledons germinated. Careful choice of the embryos appeared to be a critical factor for somatic embryo germination. Plant formation was initiated by the hypocotyl elongation followed by further root and leaf development. Over 50 plants of 'Triumph' have been recovered from the somatic embryos. Since the embryogenic cell lines can be maintained in a few petri dishes or baby food jars and multiplication of the embryos is unlimited, the *in vitro* micropropagation of cultivar 'Triumph' is very convenient and inexpensive. In addition, the easily regenerable somatic embryos are considered as unique materials for genetic transformation.

Table 1. Callus induction and somatic embryogenesis.

Cultivar	Ovules cultured	No. callus (%)	No. somatic embryos (%)
Triumph	232	161 (69.4)	10 (6.2)

Table 2. Germination rate of somatic embryos.

Medium	Somatic embryos	No. plants (%)
WP + 1 µm BA	109	5 (4.6)
WP + 5 µm BA	83	21 (25.3)

Explant used in initial culture is critical for callus induction. Although leaves, petioles, and ovules have successfully been used for callus initiation, Gray and Purohit (1991) describe that callus derived from different somatic cells varied in its competence to form callus and embryos. This study shows that ovules are excellent materials for high frequency callus initiation and somatic embryo formation. Moreover, the ovules have little chance to be contaminated. The ovules, therefore, seemed to be a better initial material for callus induction, and somatic embryogenesis in muscadine grape.

The germination of somatic embryos was relatively low. Gray (1989) believed that dehydration and exogenous growth regulators play an important role in grape somatic embryo dormancy, quiescence and germination. Gray and Purohit (1991) also indicated that incorporation of BA into medium significantly increased the embryo germination percentage. A combination of auxins and cytokinin was also found to be suitable for somatic embryo germination (Gray, 1992). In order to increase the frequency of plant recovery from somatic embryos, further investigation to explore medium composition, including the type, combination and concentration of plant growth regulators is necessary.

Literature Cited

Cheng, A. M. and B. I. Reisch. 1989. Shoot regeneration from petioles and leaves of *Vitis* × *Labruscana* "Catauba". Plant Cell Rept. 8:403-406.

Emershad, R. L. and D. W. Ramming. 1994. Somatic embryogenesis and plant development from immature zygotic embryos of seedless grapes (*Vitis vinifera* L.). Plant Cell Rept. 14:6-12.

Faure, O., M. Gengoli, A. Nougarede, and N. Bagni. 1991. Polyamine pattern and biosynthesis in zygotic and somatic embryo stages of *Vitis vinifera*. J. Plant Physiol. 138:545-549.

Gray, D. J. 1989. Effects of dehydration and exogenous growth regulators on dormancy, quiescence and germination of grape somatic embryos. *In Vitro* Cell Div. Biol. 25:1173-1178.

Gray, D. J. 1992. Somatic embryogenesis and plant regeneration from immature zygotic embryos of muscadine grape (*Vitis rotundifolia*) cultivar. Amer. J. Bot. 79:542-546.

Gray, D. J. and C. P. Meredith. 1992. Grape. p. 229-262. In: F. A. Hammerschlag and R. E. Litz (eds.). Biotechnology of Perennial Fruit Crops. CAB Intern. Oxford, UK.

Gray, D. J. and A. Purohit. 1991. Somatic embryogenesis and development of synthetic seed technology. Critical Rev. Plant Sci. 10:33-61.

Mauro, M. C. and J. Fallot. 1986. Stimulation of somatic embrogenesis and plant regeneration from anther culture of *Visit vinifera* cv. Cabernet-Sauvignon. Plant Cell Rept. 5:377-380.

Robacker, C. 1993. Somatic embryogenesis and plant regeneration from muscadine grape leaf explants. HortScience 28:53-55.