Gibberellins Promote Flowering in Two *Cryptocoryne* Species

M.E. Kane, G.L. Davis, and T.D. Hoffner

Department of Environmental Horticulture, P.O. Box 110670, University of Florida, Gainesville, FL 32611

R.J. Henny

Central Florida Research and Education Center, 2807 Binion Road, University of Florida, Apopka, FL 32703

Additional index words. aquarium plants, growth regulators, micropropagation

The genus *Cryptocoryne* (Araceae) contains some of the commercially most valuable imported aquatic foliage plants used in the aquarium plant trade (Rataj and Horeman, 1977). Native to southeastern Asia and Indonesia, cryptocorynes are herbaceous amphibious plants with attractive petiolar leaves produced in basal rosettes. Species are differentiated by foliage and floral characteristics. Floral features, specifically spathe morphology, coloration, and length, are essential for accurate identification, particularly of imported plants (Mühlberg, 1980). However, many species rarely flower in nature or under cultivation (Rataj and Horeman, 1977). Consequently, positive identification of cryptocorynes is a constant problem for both the grower and consumer.

According to previous studies, application of gibberellic acid (GA_3) stimulated flowering in *Aglaonema*, *Caladium*, *Dieffenbachia*, *Spathiphyllum*, and other genera of the Araceae (Harbaugh and Wilfret, 1979; Henny, 1988; Henny and Hamilton, 1992). Treatment with GA_3 to promote flowering in cryptocorynes would prove useful for species identification. In this study, we examined the effect of GA_3 application on flowering of *Cryptocoryne lucens* de Witt and *C. beckettii* Thwaites ex Trimen.

Experiments were conducted using aerial plants of *C. lucens* and *C. beckettii* produced in tissue culture (Kane et al., 1990). Plants were grown for 32 weeks in 2.1-liter pots (15 cm in diameter) filled with MetroMix-500 (Grace Sierra, Milpitas, Calif.) before treatment. Plants were placed in a shaded greenhouse with 425 $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$ maximum light and a 27C day/24C night temperature range. Fertilization consisted of placing one 7.5-g tablet of Sierra 16N-3.5P-9.9K Tablets Plus Minors (Grace Sierra) per pot. Potting medium also was saturated at 6-week intervals with 20N-13.9P-3.7K liquid fertilizer containing 150 mg N/liter. Plants were treated with a single foliar spray of GA_3 (ProGibb, Abbott Laboratories,

North Chicago, Ill.) at 0, 250, 500, or 750 mg a.i./liter. Tween-20 (Fisher Scientific, Springfield, N.J.) at 1 drop/liter was added as a wetting agent. Each plant was thoroughly sprayed on the upper and lower leaf surfaces with 10 ml solution. A randomized block design was used, with one plant per experimental unit and 10 replications per treatment. Plants were monitored weekly for inflorescence formation and the number of open inflorescences (unfurled spathe) produced per plant. Data were statistically analyzed using the General Linear Models procedure and Tukey's Honestly Significant Difference (HSD) test ($\alpha = 0.05$).

Nontreated plants of *C. lucens* did not flower, whereas one nontreated plant of *C. beckettii* produced a single open inflorescence by week 14. By week 16, 60% of the nontreated

C. beckettii produced open inflorescences (0.8 inflorescences per plant). Treatment with GA_3 significantly stimulated flowering in both species (Fig. 1); flower buds were visible by week 12, with maximum flowering occurring by week 15. Within species, flower counts were not significantly different for the three GA_3 concentrations (Fig. 1). We recommend a single application of GA_3 at 250 $\text{mg}\cdot\text{liter}^{-1}$ to promote flowering in both species. Regardless of GA_3 level, all flowers produced were normal in morphology (Fig. 2 A and B). We obtained similar responses for both species when GA_{4+7} was used (data not shown). Gibberellin-induced flowering should prove useful for identifying other *Cryptocoryne* species. The subsequent micropropagation of identified *Cryptocoryne* species will aid in reducing plant misidentification in the aquarium plant trade.

Literature Cited

- Harbaugh, B.K. and G.J. Wilfret. 1979. Gibberellic acid (GA_3) stimulates flowering in *Caladium hortulanum* Birdsey. HortScience 14:72-73.
Henny, R.J. 1988. Ornamental aroids: Culture and breeding. Hort. Rev. 10:1-33.
Henny, R.J. and R.L. Hamilton. 1992. Flowering of *Anthurium* following treatment with gibberellic acid. HortScience 27:1328.
Kane, M.E., E.F. Gilman, M.A. Jenks, and T.J. Sheehan. 1990. Micropropagation of the aquatic plant *Cryptocoryne lucens*. HortScience 25:687-689.
Mühlberg, H. 1980. The complete guide to water plants. EP Publishing, London.
Rataj, K. and T.J. Horeman. 1977. Aquarium plants. T.F.H. Publications, Neptune, N.J.

Fig. 1. Effect of GA_3 application on production of open inflorescences in *Cryptocoryne lucens* and *C. beckettii* 15 weeks after treatment. Each histogram represents the mean response of 10 plants. Within species, Tukey's HSD = 4.35 at $\alpha = 0.05$.

Fig. 2. Flowering of (A) *Cryptocoryne lucens* and (B) *Cryptocoryne beckettii* 15 weeks after treatment with a single foliar spray of GA_3 at 250 $\text{mg}\cdot\text{liter}^{-1}$.

Received for publication 11 July 1994. Accepted for publication 15 Nov. 1994. Florida Agricultural Experiment Station Journal series no. R-03920. The cost of publishing this paper was defrayed in part by the payment of page charges. Under postal regulations, this paper therefore must be hereby marked advertisement solely to indicate this fact.