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Ornamental Ginger as Flowering Potted Plants – Part 2 Effects of Rhizome Storage on Growth and Development

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BACKGROUND

Ornamental ginger is a popular cut flower and has been promoted as a flowering potted plant because of its unique foliage, long-lasting colorful bracts, and few pest problems. Herbaceous perennials of the *Zingiberaceae* family, they have fleshy rhizomes and tuberous roots that are used for propagation. Under short days, plants enter “dormancy” and the rhizomes are harvested. Determining the effects of rhizome storage on “dormancy” and subsequent emergence are essential for uniform production of a marketable flowering potted plant. Thus, the objectives of this study were to determine the effect of storage time and temperature on shoot emergence, growth, and flowering.

MATERIALS AND METHODS

Rhizomes of four ginger species, *Curcuma alismatifolia*,

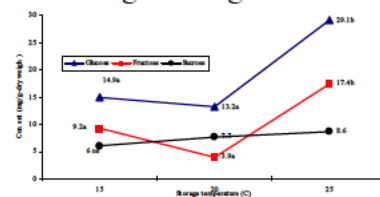
C. roscoeana, Wallich, *Globba winittii* C.H. Wright, and *Kaempferia galanga* L., were stored for 2, 3, or 4 months at 59, 68, or 77°F at the University of Hawaii. Following storage, rhizomes were shipped by air to Louisiana State University for forcing. Ten rhizomes per storage treatment were individually planted in 6 inch standard depth containers with a peat moss:bark:perlite mix amended with dolomite and superphosphate. They were placed in a greenhouse set at 86°F day/77°F night. After shoot emergence, the pots were placed in a completely randomized design in a separate greenhouse set at 77°F day/70°F night with 40% shade. Plants were fertigated at every watering at 200 ppm N provided by Peter’s Tropical Foliage (24 N-8 P₂O₅-16 K₂O). Data collected included: days to emergence from planting, days to flowering from planting, number of inflorescences per pot, and final shoot dry weight.

Five separate rhizomes per treatment were used for carbohydrate analysis. Specific sugars were determined using a Waters® HPLC.

RESULTS

Curcuma alismatifolia.

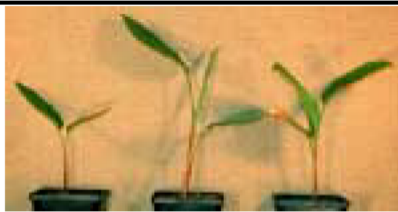
Flowering and shoot growth of *C. alismatifolia* were enhanced by decreases in rhizome storage temperatures and time. Glucose and fructose increased with an increase in rhizome storage temperature, while sucrose was not affected. This reflects the mobilization of stored sugars for growth.



Soluble sugar concentrations as affected by storage temperature.

The greatest shoot growth occurred with rhizomes held at 59°F for 2 months. In contrast, shoot emergence was hastened as the storage temperature was increased. At 77°F, emergence occurred in 5 days while at 59 and 68°F emergence occurred in 23 and 19 days, respectively.

C. roscoeana. Rhizome storage of 3 or 4 months significantly hastened shoot emergence in *C. roscoeana*.

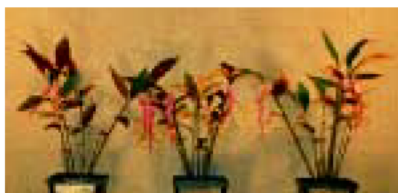


2 mo. 3 mo. 4 mo.

All stored at 59°F

Storage temperature had no significant effect on days to emergence. An increase in storage temperature decreased rhizome sucrose content and increased glucose and fructose. This again reflected the mobilization of sugars for emergence. The rhizome storage treatments had no significant effect on flowering and final shoot dry weight.

Globba winittii. Emergence and flowering were enhanced by an increase of storage temperature and time.



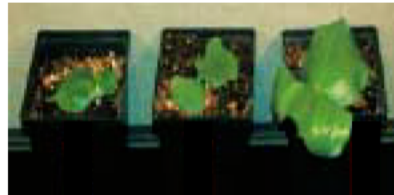
2 mo. 3 mo. 4 mo.

All stored at 77°F

Sucrose concentration in rhizomes increased as temperature increased, with the greatest occurring at 77°F with 14.2 mg/g-dry weight. In contrast, glucose and fructose concentration were not affected by rhizome storage temperature. *Globba* appears to remobilize their sugars differently than *Curcuma* species.

Kaempferia galanga.

Emergence was hastened for rhizomes stored at 77°F.



59°F 68°F 77°F

All stored for 3 months

Rhizome storage time had no effect on emergence. All rhizome storage treatments had no significant effect on days to flowering, final shoot dry weight, and rhizome sucrose, glucose, and fructose content.

CONCLUSIONS

This study indicates that a general recommendation of rhizome storage time and temperature cannot be made for the ornamental ginger. The recommendation is species specific:

- An increase in rhizome storage temperature hastened emergence for *Curcuma alismatifolia*. Flowering and growth increased with a decrease in storage time and temperature. The recommended storage treatment is two months at 59°F.
- For *C. roscoeana*, an increase in rhizome storage time hastened emergence. The recommended storage being 3 or 4 months. The higher storage temperatures increased the conversion of sucrose to glucose and fructose.

- The production time of *Globba*, in terms of emergence and flowering, was shortened with the 3 months at 77°F rhizome storage treatment. This treatment also produced the most flowers and acceptable growth.

- For *Kaempferia*, production time was reduced with an increase in storage temperature. The recommended temperature is 77°F.

IMPACT TO THE INDUSTRY

Storage time and temperature recommendations for the most rapid emergence and greatest growth and flowering of four ornamental ginger are:

C. alismatifolia: 2 months at 59°F

C. roscoeana: 3 months at 77°F

G. winittii: 3 months at 77°F

Kaempferia: time not significant, 77°F.

For additional information contact Jeff Kuehny at jkuehny@lsu.edu.

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