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Germination of *Spathiphyllum* and *Vriesea* Pollen after Storage at Different Temperatures and Relative Humidities¹

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Abstract. Pollen of *Spathiphyllum floribundum* (Linden & Andre) N. E. Br. 'Mauna Loa' and *Vriesea malzinei* E. Morr. was stored at 7° and 23°C at relative humidities of 10, 35, 65 and 90%. Optimum pollen germination of both species occurred after storage at 7°C and 65% relative humidity. Germination decreased rapidly at 23°C regardless of relative humidity.

Although there is increasing interest in breeding foliage plants, flowering

has not been controlled for many of these tropical species. Thus, pollen storage would facilitate hybridization of species which flower at different times. Several studies (1, 3, 4, 6, 7, 8, 9) have demonstrated the effect of temp and humidity on pollen viability during storage, but none included pollen from tropical foliage plants. *Spathiphyllum floribundum* 'Mauna Loa' and *Vriesea malzinei* represent 2 important families of foliage plants (Araceae and Bromeliaceae, respectively) and have pollen

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that germinates readily *in vitro* (2). This study was conducted to determine the effect of storage temp and relative humidity on pollen viability of these 2 foliage plants.

Pollen was collected from newly opened flowers on plants grown in a greenhouse in Apopka, Florida. Pollen germination was determined and simultaneously samples were placed into 5 ml serum vials. The unsealed vials of pollen were placed in 500 ml jars and suspended in cheesecloth above 200 ml sulfuric acid at concn to give relative humidities of 10, 35, 65 and 90% (10). Jars were stored in the dark at 23°C ± 2° and 7° ± 1°. Pollen samples were removed at intervals and tested for viability by germinating in single drops of Kwack's medium (5). Medium and pollen were placed on microscope slides containing two 18 mm wide × 0.5 mm deep wells and incubated at 23° ± 2° for 18-24 hr before being counted with a light microscope. A pollen grain was considered germinated if it produced a pollen tube as long as its own diam. To set a confidence interval for the % germination of each pollen sample, 4 drops of medium were used and the germination response of 100 grains in each drop constituted 1 replicate.

Spathiphyllum and *Vriesea* pollen germination declined much faster at 23°C than 7° at all humidity levels (Tables 1 and 2). Optimum pollen germination of both species occurred following storage at 7° and 65% relative humidity. Under these conditions, 57% of the *Spathiphyllum* pollen germinated after 24 weeks of storage while 69% of the *Vriesea* pollen germinated after 16 weeks. Germination declined more rapidly at both temp as the relative humidity was increased or decreased from 65%.

The effect of cool temp in prolonging pollen viability is not uncommon. However, the increase in pollen germination at 65% relative humidity is unlike most other pollens which store best at cool temp and at relative humidities of less than 50% (4, 5, 7, 8, 9). These results indicate that storage of *Spathiphyllum* and *Vriesea* pollen should include cool temp in combination with a relative humidity near 65%.

Table 1. Pollen germination of *Spathiphyllum floribundum* 'Mauna Loa' after storage at 2 temp and 4 relative humidity levels.

Storage environment		Pollen germination (%)				
Temp (°C)	Relative humidity (%)	Length of storage				
		0 wk	1 wk	4 wk	12 wk	24 wk
7	10	80 (74-85) ^Z	17 (12-22)	12 (8-17)	3 (1-5)	3 (1-5)
7	35	80 (74-85)	44 (38-50)	56 (50-62)	46 (40-52)	32 (26-38)
7	65	80 (74-85)	73 (67-79)	71 (65-77)	72 (66-78)	57 (51-63)
7	90	80 (74-85)	66 (60-72)	44 (38-50)	1 (0-4)	0 (0-1)
23	10	80 (74-85)	10 (7-14)	0 (0-1)	0 (0-1)	0 (0-1)
23	35	80 (74-85)	46 (40-52)	3 (1-5)	0 (0-1)	0 (0-1)
23	65	80 (74-85)	53 (47-59)	6 (3-10)	0 (0-1)	0 (0-1)
23	90	80 (74-85)	14 (10-19)	0 (0-1)	0 (0-1)	0 (0-1)

^ZNumbers in parentheses indicate 95% confidence interval for binomial distribution.

Table 2. Pollen germination of *Vriesea malzinei* after storage at 2 temp and 4 relative humidity levels.

Storage environment		Pollen germination (%)			
Temp (°C)	Relative humidity (%)	Length of storage			
		0 wk	2 wk	4 wk	16 wk
7	10	81 (76-86) ^Z	52 (47-59)	14 (10-19)	3 (1-6)
7	35	81 (76-86)	46 (40-52)	16 (11-21)	10 (7-14)
7	65	81 (76-86)	74 (68-80)	80 (74-85)	69 (63-75)
7	90	81 (76-86)	10 (7-14)	2 (1-5)	0 (0-1)
23	10	81 (76-86)	0 (0-1)	0 (0-1)	0 (0-1)
23	35	81 (76-86)	0 (0-1)	0 (0-1)	0 (0-1)
23	65	81 (76-86)	24 (19-30)	10 (7-14)	0 (0-1)
23	90	81 (76-86)	0 (0-1)	0 (0-1)	0 (0-1)

^ZNumbers in parentheses indicate 95% confidence interval for binomial distribution.

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