

THE HSPR NEWSLETTER

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Our next meeting will begin at 10:00 on **Sunday, June 24, 2001** at the Fundación Luis Muñoz Marin (Carr. 877, Km 0.4) in San Juan. (Please note that because of scheduling difficulties this meeting does not occur on our customary weekend.) A map is provided at the end of this newsletter.

Please remember to bring any new plants, interesting information or observations about heliconias and other Zingerberales for the "Show and Tell". Also, bring your available plants for the raffle, sale, or exchange. Chairs and refreshments ("finger food") will be provided so please come and enjoy yourselves.

The major purpose of this meeting will be finalize plans for a heliconia/Zingerberales garden at the Fundación Luis Muñoz Marin (see below). Thanks to Judy Nelson for the arduous task of organizing this meeting.

PRESIDENT'S CORNER

I believe that a heliconia garden at the Fundación Luis Muñoz Marin presents an excellent opportunity for HSPR to contribute to Puerto Rico. The Fundación Luis Muñoz Marin is a very special place from a variety of perspectives. Needless to say, the Fundación commands respect in terms of the historical legacy of Luis Muñoz Marin. However, rather than belabor this self-evident point, I will mention some other reasons why I believe the Fundación Luis Muñoz Marin is an excellent locale for a heliconia garden. These reasons will become almost immediately obvious to HSPR members upon visiting the Fundación.

First, is the overall physical setting. The Fundación Luis Muñoz Marin essentially represents an oasis of tranquility and greenery amidst the hustle and bustle of the surrounding metropolitan area. Because of these contrasting conditions, a garden can make an especially effective impression on a visitor.

Second, the site selected for the heliconia garden has excellent conditions in terms of topography, moisture, and light for heliconia, gingers and other Zingerberales.

Third, security is an important concern for gardens open to the public. As is apparent by the profusion of orchids and bromeliads, thief is not a problem at the Fundación Luis Muñoz Marin. The Fundación is therefore an unmatched site to safely display some of the rarer plants.

Fourth, it is also very evident that the director of the garden, Miguel Calzada, and his staff are highly skilled and dedicated. Plants will be in good hands at the Fundación Luis Muñoz Marin.

SOME MORE 'JUST SO' STORIES

The following are two articles about Zingerberales which recently appeared in the scientific literature.

One of the many animals associated with heliconias in Central America is the white tent bat (*Ectophylla alba*). This bat chews along both sides of the central midrib of heliconia leaves causing the leaf to curl up, forming a

protective roosting tent for the bats. (An photograph of this situation is found on page 26 in Exotic Tropicals of Hawaii by Angela Kepler [1989]). Quite puzzlingly, these tents can stay healthy for long periods even though the severing of the veins has presumably cut off the the leaf's water supply. C.A. Peterson and B. Fenton (2001, Biol. J. Linn. Soc. 72:179-191) investigated this phenomenon and found that the vein system of heliconia leaves is quite complex involving a hierarchical system of five types of conducting elements. Evidently, water conduction by the smallest veins is sufficient to sustain the leaf even when more major veins have been severed. The water conduction system of heliconia leaves is, of course, advantageous for the bats because they do not have to make new tents continuously. Alternatively, this system is also advantageous for the heliconia plant because leaves can survive damage from insects, wind, rain or other destructive forces.

One the advantages of cross-pollination in plants is to prevent the detrimental effects of inbreeding. Qing-Jun Li et al. (2001, Nature 410:432) describe a novel mechanism that favors outcrossing in nine species of the ginger *Alpinia* occurring in the rain forests of southwest China. All species examined by Qing-Jun Li et al. have two different types that differ in the movement of the the stigma (the pollen receptor). During the early morning hours (0600-0630), the stigma of one type is flexed above the anther from which pollen is being released, thereby preventing self-pollination. Meanwhile, the other type is not shedding pollen and its stigma is flexed downward below the anther to accept pollen (presumably transported by insects) from the first type. In the afternoon (1430-1500) the situation is reversed, the stigma of the first type is flexed below its anthers (which have now stopped shedding pollen) while the stigma of the second type is flexed above its pollen-shedding anthers.

Unfortunately, Qing-Jun Li et al. name only one of the nine studied species (*Alpinia kwangsiensis*) in this article. However, they state that the *Alpinia* they examined belong to three different groups (clades), suggesting that this pollination mechanism is widespread within this genus, and possibly other genera as *Amomum*. There are more than 250 species of *Alpinia* including the common 'red ginger' *Alpinia purpurata* and its numerous cultivars. Based on my experience, the situation differs with *Alpinia purpurata* although the overall effect may be essentially similar. The stigma of *Alpinia purpurata* is always above the anther, thereby preventing self-pollination. Pollinators have to transport pollen past the stigma. Self-pollination may be prevented during this process by hair-like structures on the stigma which keep pollen from accidentally falling back into the stigma of the same flower. Alternatively, this structure may tend to collect pollen which is being transported from another flower.

This 'passive' system against self-pollination seems to have a major flaw. What prevents 'self-pollination' between different flowers on the same bract? Some additional mechanisms preventing this type of self-pollination may be involved, judging from my attempt to breed a pure white *Alpinia purpurata*. I collected and planted seeds from several seedpods from an almost-white form (cv 'Anne Hironaka') assuming that at least some of the seeds resulted from self-pollination by different flowers on the same plant. However, all these seedlings produced darker flowers, indicating that the pollen came from some nearby dark-flowered plant. Perhaps as with the *Alpinia* studied by Qing-Jun Li et al., different types of *Alpinia purpurata* differ in the time of day when pollen is released. In any event, the pollination system of *Alpinia purpurata* would be interesting to study.