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SEPTEMBER MEETING

Our next meeting will be hosted by Rafael Benitez on Sunday, September 10, 2000 from 9:30 AM to 1:00 PM at his farm, "La Quinta" near Fajardo. A map as well as a description of La Quinta is enclosed in this newsletter. Members planning to tour Rafael's farm should bring good walking shoes. Rain gear is probably also a good idea. Also, please remember to bring your chairs and refreshments.

PRESIDENT'S CORNER

During the HSPR meeting inJune, Judy Nelson talked about variations among seedlings of *H. bihai* and other heliconias. I believe that Judy offered some new and valuable information about heliconia biology.

Everybody seems to agree that the taxonomy of *H. bihai* needs revision. For instance, Berry & Kress (1991, Heliconia, an Identification Guide) call *H. bihai* a "complex and diverse" species. Andersson (1981, Nordic J. Bot.) describes it as a "very polymorphic" group. One way to make some taxonomic sense out of this group would be to document the extent to which seedlings vary from one another among various varieties of *H. bihai*. Judy showed that flowering bracts of some *H. bihai* (which I will call the 'Halloween'/'Lobster Claw' type) often varied from seedling to seedling, whereas seedlings of the 'Giant Lobster Claw' were essentially indistinguishable from one another. These observations suggest differences between these *H. bihai* types - why is Halloween variable and the Giant Lobster Claw not? Can these two types 'hybridize'? I believe that observations such as Judy's will eventually help us make some sense out of *H. bihai*.

I have often wondered whether different varieties of our native *H. caribea* occur here in Puerto Rico. If our *H. caribea* follows distributional patterns often observed elsewhere (e.g., Costa Rica), different varieties would tend to occur in different river drainages. The existence of such localized distributions is probably related to seed dispersal - low dispersal results in greater genetic isolation and, hence a greater probability of different varieties occurring in different localities. Following seed dispersers would be one way to evaluate this mechanism. However, this would be an extremely difficult task, in part because of the large number of dispersers. For instance, in Costa Rica one would have to follow several individuals of 28 bird species that consume heliconia seeds (Stiles & Daniels, 1979, Brenesia, Sup 1). An alternative approach which bypasses this herculean hurdle would be to have a single source of seeds (which is not the case with our *H. caribea*). The spread of the *H. bihai* seedlings at Marin Alto Tropicals described by Judy Nelson thus represents valuable information about heliconia seed dispersal. For instance, I would not be inclined to search all over Puerto Rico for different *H. caribea* varieties if these *H. bihai* seedlings spread to other river drainages around Marin Alto Tropicals.

Some 'JUST SO' heliconia stories:

Biologists sometimes refer to interesting observations as 'just so' stories (from the Rudyard Kipling book). Two recent articles reveal some 'just so' features about heliconias. Just as the fruit fly is well-known in biology because of its pivotal role in genetics, heliconia enthusiasts can take special pride in these 'just so' stories since heliconias may become recognized scientifically because of its impact in ecology and evolutionary biology.

In reference toJudy Nelson's description last March of hybrids of the green *H. bihai*, I had commented on cross-pollination and other hybridization barriers among heliconias in the last newsletter. Temeles et al.(July 21, 2000, Science) relate a 'just so' story about pollination of the green *H. bihai* and red *H. caribea* in St Lucia. (Note that the green *H. bihai* originates from St Lucia according to Berry and Kress [1991]). Temeles states that heliconias in St Lucia are only pollinated by a hummingbird, the purple-throated carib *Eulampis jugularis*. More interestingly, female hummingbirds only pollinate *H. bihai*, and males only pollinate *H. caribea*. These differences are related to differences between heliconia flowers and sexual differences in hummingbird bills; females have longer and more curved bills corresponding to the longer and more curved flowers of the green *H. bihai*; while males have shorter and straighter bills in correspondence to the shorter, straighter flowers of the red *H. caribea*. This relationship thus reduces the chances of cross-pollination, hence hybrid formation, between these species.

These observations are especially interesting to biologists because according to resource partitioning theory (a.k.a. niche theory), specialization in different foods (and other resources) is critical in determining biodiversity. Temeles' results represent the first documented evidence that different sexes (rather than different species) specialize in different resources. These results also have implications for the heliconia grower. Growing the green *H. bihai* and red *H. caribea* in Puerto Rico will change the pollination system because the purple-throated carib occurs only in St Lucia. However, whether rates of hybridization will increase (or decrease) compared to St Lucia remains to be determined.

Finally, I feel that pollination in St Lucia is not as clearcut as Temeles implies. On a trip to St Lucia several years ago, we observed some green/red heliconias which we categorized as hybrids of *H. bihai* and *H. caribea* based on the (i) intermediate morphological characteristics, and (ii) presence of both parent forms in the vicinity. (These are the major criteria that have to used to identify hybrid heliconias.) Temeles also observed these green/red forms but called them 'morphs' of the green *H. bihai*. Interestingly however, Temeles found that the flowers of these green/red forms were were more similar to *H. caribea* rather than *H. bihai*, a feature which is more consistent with the hybrid interpretation, at least for me. More importantly, refering back to the taxonomic problem of *H. bihai*, these forms indicate that taxonomic problems extend beyond *H. bihai* - how valid is the distinction between *H. bihai* and *H. caribea* ?

Beetles are renowned among biologists for their high biodiversity; accounting for some 100,000 of the 1.7 million species described to date. This is why the geneticist J.B.S. Haldane when asked what his extensive knowledge revealed about God, replied that God must have "an inordinate fondness for beetles." The high biodiversity is a major reason why biolgists are especially interested in the evolutionary history of beetles. One proposed cause is that beetle biodiversity is related to the diversification of plants; increasing plant biodiversity increases the number of different foods and habitats thus

enabling beetle biodiversity to increase (i.e., another aspect of resource partitioning theory). In particular, one of the more diverse beetle groups, the leaf-beetle clade Chrysomelidae with more than 38,000 species generally specializes on heliconias, gingers and other Zingerberales. Paleontologists have speculated that leaf-beetles have diversified in parallel with the diversification of the heliconias and their relatives; more specifically, that the first beetle was associated with a chemically simple ginger and later diversified with the heliconias. Unfortunately, verifying this hypothesis is difficult because the fossil record of beetles is poor.

The discovery by Donald Strong in the 1980's that different leaf-beetle species leave different bite marks on leaves promises to be an unexpected avenue to study the evolution of beetles. Wilf et al. (July 14, 2000, Science) observed bite marks on a fossilized ginger *Zingerberopsis* (related to the present day *Alpinia*) having characteristics of leaf-beetle bites. On this basis they have described a new beetle *Cephaloleichnites strongi* (the fossils of this beetle itself has not been found). These fossil leaves are 53 million years old, or some 20 million years older than the oldest fossils of the leaf-beetles, and are about as old as any beetle fossil discovered. Several paleontologists are now busily re-examining fossil heliconia and ginger leaves in their museum collections for leaf-beetle bite marks. Perhaps their efforts will eventually reveal how God organized the evolution of beetles.

TREASURER'S REPORT

Martha Lankord, substituting for Jannette Crespo reported that the treasury presently contains $2,152.59.

LETTER TO THE INTERNATIONAL HELICONIA SOCIETY

The following is a copy of a letter that Bob Lankford recently sent to the International Heliconia Society about the nomenclatural chaos of heliconias.

22 June, 2000

To Members of the Board
Heliconia Society International

The purpose of my letter to each member of the HSI governing body is once again: a) to state my deep and growing concern regarding the bourgeoning chaos surrounding Heliconia "C/V" nomenclature, and, b) to strongly urge the Board to initiate appropriate corrective measures at its biennial meeting on July 26, 2000. It is my personal view that the present "C/V" situation has become an unnecessary jumble of disordered names lacking adequate definition (too often lacking even a species name) and utility. Collectors today are at a complete loss in terms of knowing what kind of plant they are acquiring. This situation should never have arisen. It is my personal perception that there are at least three facets to the "C/V" problem:

1. There is persistent misunderstanding and misuse of the concept of cultivated variety (or C/V), as applicable to heliconias. Quite simply, varieties, forms, subspecies, etc. which are found and collected in wild populations can not be called C/Vs until such time that subsequent cultivation demonstrates the constancy and stability of a varity's distinctive characteristic(s). To state otherwise is certainly untrue and surely misleading.

2. When heliconias burst on the popularity scene more than fifteen years ago, there was a responsive rush to the jungles to collect wild plant material for the growing market. The result was a proliferation of "C/V" names continuing even today which were made in a disordered and unregulated vacuum.

3. The past HSI Board meetings have failed to acknowledge publicly that the Heliconia C/V situation is indeed a problem and, more importantly, must be dealt with effectively. As a Charter Member of HSI, I feel it is my obligation to charge the present Board to include the Heliconia "C/V" problem on the agenda of its next meeting on July 26, 2000, and to take appropriate action. Most other plant societies have well ordered systems for the registration of hybrids, varieties, C/Vs, clones, whatever. Many follow guidelines given in the International Code of Nomenclature for cultivated Plants. Heliconia Society International could do as well.

Since I will not be able to attend the meeting, I would appreciate a copy of the Board's agenda report.

Respectfully submitted,

Robert R. Lankford
Charter Member

c.c.: Heliconia Society of Puerto Rico
Heliconia Society of South Florida

"LA QUINTA" AT THE RAINFOREST EXPERIENCE FARMS

"***La Quinta***", is a unique Eco-Tourism concept created for the exclusive enjoyment of individuals, groups or convention activities. It is nestled in **The Rainforest Experience Farms**, a 60 acre plantation of tropical exotic flowers and foliage in *Barrio Naranjo Arriba*, Fajardo. The farm is a rain forest at an altitude of 1,800 feet which is the natural habitat for the 152 varieties of Heliconias, 28 varieties of Gingers, Curcumas, Calatheas and exotic foliage plants presently being grown commercially for the cut flower industry.The farm has one of the most complete collections of tropical exotic plants in the world and supplies in commercial quantities the rarest tropical flowers to Puerto Rico, the U.S. Virgin Islands, and mainland U.S. markets. Every step has been taken to maintain the forest in its natural state; maintaining the eco-system by generating its own electricity by windmill, collecting rainwater for its needs and by consciously planting within the forest using its natural shade according to the needs of each plant species. The farm is a magnificent example on how agriculture can be used to offer a buffer zone to protect the Caribbean National Rain Forest *El Yunque*. **The Rainforest Experience Farms** ends where *El Yunque* starts.

"***La Quinta***" *at* **The Rainforest Experience Farms** is an exquisite house, on a mountain top surrounded by luscious gardens and trails, decorated and furnished with an eye for detail, quality and functionality. You are surrounded at all times by the most beautiful panoramic view of the East Coast of Puerto Rico, the Caribbean, the Spanish and U.S. Virgin Islands, as well as the Rain Forest itself.

The house is equipped with a "state of the art" industrial kitchen and outdoor grills to suit your catering needs. The Bar area in the first level opens out to a roofed terrace and a grand patio which extends to gardens of very rare species of heliconias, gingers and other tropical flowers and plants. Inside the bar area, a lounge set-up with a fireplace is furnished very comfortably for your enjoyment and relaxation. The house offers two

additional exquisitely decorated rooms, which can be used as chatting, dining or conference rooms.

"***La Quinta***" is set up to accommodate group activities, let it be daytime or nighttime, theme parties, corporate parties, formal dinners, meetings, etc. Groups of 50 to 1000 persons would be very comfortable in the house and its surroundings. There is ample parking for buses. In addition, facilities for open-air informal parties or activities exist right in the middle of the rain forest, surrounded by acres and acres of tropical flower plants and a beautiful ravine.

You can incorporate the excitement of walking or hiking along the trails of the rain forest and experiencing nature in its most exuberant expression ; this is, 60 acres of tropical exotic flowers and foliage and breathtaking views and landscape in a farm cultivated with the rarest species for supply to the local and international flower markets.

The property also offers the perfect setting for team building events, be it designed by you or those designed by us, whichever provides the benefits you are interested in.

Catering arrangements and options range from the most typical Puerto Rican food, to an "All American Steak House", to the international gourmet menu that you might prefer. Although we prefer using our in-house catering options, we maintain flexibility with the arrangements you might want to make regarding the supplier and/or the menu since our purpose is to facilitate you with the tools to make your activity very special and unique.

Our GOAL is to provide you with a very uniquely versatile setting for your activity so that your imagination can run loose, with our assurance and commitment of world-class quality and service at ***"La Quinta"at*** **The Rainforest Experience Farms**.

Information and Reservations

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