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The Gingers of Sarawak I – The Giants

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Sarawak, the largest state in the Malaysian Federation is situated in the north and north west of the island of Borneo with Kalimantan (Indonesian Borneo) to the south and the independent Sultanate of Brunei to the East. Sarawak lies wholly within the equatorial wet tropics and this, combined with a highly dissected and mountainous terrain and an extraordinarily diverse geology provides an enormous range of habitats into which numerous herbaceous terrestrial monocotyledons – notably Araceae, the aroids, and

Zingiberaceae, the gingers, have speciated to a breathtaking degree to the extent that it can be stated that the state is the centre of diversity for both families in the Asian tropics and is arguably the richest and most diverse area for the gingers globally.

There is currently no single up to date re-



Fig. 1a *Etlingera coccinea*



Fig. 1b *Etlingera elatior*



Fig. 1c *Etlingera elatior*



Fig. 1d *Etlingera coccinea*

Fig.2a *Etlingera triorgyalis*Fig.2b *Etlingera brevilabrum*Fig.2c *Etlingera brevilabrum*Fig.2d *Etlingera brachyla* - orange formFig.2e *Etlingera brachychila* - yellow form

vision for the Zingiberaceae of Borneo although various generic and local accounts have provided an excellent framework from which several botanists are now beginning to piece together what will be an account for the whole of the Malesian region – essentially an account of the gingers of Malaysia, Indonesia, the Philippines and Papua New Guinea.

At present there are 18 indigenous genera of Zingiberaceae recorded for Sarawak with two others (*Curcuma* & *Kaempferia*) occurring probably as the result of ancient introduction as food or medicinal plants. Although there is yet no precise figure for the number of

ginger species in the state it is clear from field observations that it is exceptionally rich in species (I have observed 16 species in one area of forest) and that a significant number of these species still await a formal name.

This short series of articles is not in any way intended to provide a formal nor exhaustive account of the gingers of Sarawak, rather to give a small taste of the genera and some of the most spectacular and beautiful species. For convenience sake I have divided the account to deal first with the very largest species, next the large to medium-sized and lastly the miniatures.

Broadly speaking the giant species are accounted for by two genera, *Etlingera* and *Plagiostachys* although by no means are all of the species of these genera are huge. Additionally there are a handful of very large-growing species in the genera *Hornstedtia* and *Zingiber*.

Etlingera is a genus of slender to enormously ro-

The Purpose of HSI

The purpose of HSI is to increase the enjoyment and understanding of *Heliconia* (Heliconiaceae) and related plants (members of the Cannaceae, Costaceae, Lowiaceae, Marantaceae, Musaceae, Strelitziaceae, and Zingiberaceae) of the order Zingiberales through education, research and communication. Interest in Zingiberales and information on the cultivation and botany of these plants is rapidly increasing. HSI will centralize this information and distribute it to members.

The **HELICONIA SOCIETY INTERNATIONAL**, a nonprofit corporation, was formed in 1985 because of rapidly developing interest around the world in these exotic plants and their close relatives. We are composed of dues-paying members. Our officers and all participants are volunteers. Everyone is welcome to join and participate. HSI conducts a Biennial Meeting and International Conference.

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Fig. 3a *Plagiostachys glandulosa*Fig. 3b *Plagiostachys crocydocalyx*Fig. 3c *Zingiber spectabile*Fig. 3d *Hornstedtia reticulata*

bust, medium-sized to gigantic herbs that are distinctive for their 'walking' culms – the individual leafy shoots arising from the rhizome – the individual leafy shoots arising from the rhizome are often some considerable distance (occasionally several metres) apart. The inflorescence in *Etilingera* either opens near or at ground level – giving rise to the popular name 'earth ginger' – with the resulting fruits partially buried (Fig. 1a), or the inflorescences are carried on erect leafless shoots up to 2 m tall and produce fruits in a large cudgel-shaped head (Fig. 1b). In the past the species with the ground-level inflorescences and partially buried infructescences were placed in the genus *Achasma* with those with the aerial inflorescences were in *Nicolaia* or *Phacomeria*; all these genera are today are treated as part of a broadly defined *Etilingera*.

Etilingera is an important genus in Sarawak with species often dominant in lowland forest and several utilized as flavouring aromatics. Perhaps the best known is *E.*

elatio (Fig. 1c) which aside being a popular cut flower and landscaping ornamental has the unopened inflorescences used as a flavouring (kantan) in the wonderful Sarawak laksa (noodles in a spicy coconut gravy with shrimp & chicken). Another species, *E. coccinea* (Fig. 1d) has leaves and shoots with a strong coriander (cilantro) aroma and taste and is used in much the same way by the indigenous Bidayuh people of western Sarawak who call it tipu. Interestingly there is a vegetatively similar species, *E. triorgyalis* (Fig. 2a) in which the crushed leaves smell and taste strongly of kerosene; not a plant to confuse for culinary purposes!

While most of the giant ginger species are spectacular in leaf it is seldom that the leaves *per se* are notably strikingly coloured. One exception is *Etilingera brevilabrum* (Fig. 2b & 2c) with its broad oblong leaves liberally spotted deep maroon and carried on waxy-white (pruinose) culms. *Etilingera brevilabrum* is frequently encountered on clay stream banks and I have observed it dominating several hundred metres of streamside in Kapit Division in central Sarawak.

The majority of *Etilingera* in Sarawak have flowers in shades of pink or red although exceptions include *E. brachychila* which can appear in orange (Fig. 2d) and a particularly striking chrome yellow (Fig. 2e) each with a contrasting staminode.

Most gingers produce their inflorescences either from the tips of leafy shoots (as in, e.g., *Alpinia*) or from the base of these shoots either close by (as in *Zingiber*) or at some distance away (e.g., *Etilingera*). However, *Plagiostachys* is immediately recognizable in that its in-

Fig. 4a *Zingiber pachysiphon*

Fig.4b *Zingiber pachysiphon*Fig. 4c *Zingiber kelabitianum*Fig. 4d *Zingiber kelabitianum*

florescences rupture through the leafy culms and appear up to 1 m up the aerial shoots (Fig. 3a). Most *Plagiostachys* are medium-sized to rather large herbs with densely clustering culms. One remarkable exception is the gargantuan *P. crocydocalyx* which with culms up to 5 m tall and individual leaves exceeding 1 m long also outstrips all other species in producing an inflorescence up to 1 m long. Another remarkable feature of many *Plagiostachys* species is that frequently the bracts clothing the inflorescences deliquesce (literally melt) into slimy goo and from this the individual flowers emerge (Fig. 3b). It is thought that this slime-covered inflorescence axis might be a means to prevent the flowers being robbed of pollen or nectar by insects that are not the pollinators. Interestingly, several other species of gingers go in for apparently similar methods of protecting the flowers with, e.g., *Zingiber spectabile* from West Malaysia having mucilage-filled cups from which the flowers emerge (Fig. 3c) or *Hornstedtia reticulata* (Fig. 3d & 5d) with a water-filled cup with the flowers emerging like small beaks.

Zingiber will be covered mainly in the next article but two species, *Z. pachysiphon* and *Z. incomptum*, need to be included here since both are large to very large-growing. *Zingiber pachysiphon* (Fig. 4a) is a species of shales in the Rejang valley river system of central Sarawak. The distinctive culms have inflated blistered ligules making *Z. pachysiphon* instantly recognizable even as juvenile plants (Fig. 4b); *Zingiber kelabitianum* (Fig. 4c) is similar but has the leafy culms distinctly velvety hairy (Fig. 4d). In flower *Z. pachysiphon* is unmistakable with the white and deep violet bracted inflorescences appearing in considerable numbers at the base of the plant. The young inflorescences are sold as a flavoursome (if somewhat slimy!) vegetable in Kapit.

Zingiber incomptum (Fig. 5a) belongs to a group of species with the flower bearing portion of the inflorescence ascending at the tip of the trailing peduncle and the individual bracts recurving and often strikingly parti-coloured, deep red to scarlet outside and white inside.

Fig. 5a *Zingiber incomptum*

Most of these species are medium-sized but *Z. incomptum* can reach up to 3 m tall although the culms are rather slender.

To round off our tale of giants there are two striking *Hornstedtia*. First, *H. pininga* var. *borneense*, a species while not gigantic

Fig.5b *H. pininga* var. *borneense*

Fig. 5c *Horstedtia pininga* var. *borneense*Fig. 5d *Hornstedtia reticulata*

in stature is noteworthy because the large rhizome is carried on stout stilt roots up to 2 m tall, the whole plant held high above surrounding low scrub and seeming to be walking through the forest (Fig. 5b). The white-frosted inflorescences arise in clusters close to the rhizome (Fig. 5c). Another notable species is *H. reticulata* (Fig. 5d) with a more conventional ground-level rhizome but with tall, stout culms to 2.5 m tall. The culm and petiole sheaths have a distinctive netted appearance and stripped from the plant and dried are used locally in Sarawak to weave mats (kasah) on which rice is laid out to dry before it is processed to remove the husk.

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Genera of Zingiberaceae in Sarawak.

(*) denotes the genus probably non-indigenous.

- | | |
|-------------------------|---------------------------|
| 1. <i>Alpinia</i> | 11. <i>Geostachys</i> |
| 2. <i>Amomum</i> | 12. <i>Globba</i> |
| 3. <i>Boesenbergia</i> | 13. <i>Haplochorema</i> |
| 4. <i>Burbridgea</i> | 14. <i>Hedychium</i> |
| 5. <i>Camptandra</i> | 15. <i>Hornstedtia</i> |
| 6. <i>Curcuma</i> (*) | 16. <i>Kaempferia</i> (*) |
| 7. <i>Elettaria</i> | 17. <i>Plagiostachys</i> |
| 8. <i>Elettariopsis</i> | 18. <i>Scaphochlamys</i> |
| 9. <i>Etlingera</i> | 19. <i>Tamijia</i> |
| 10. <i>Geocharis</i> | 20. <i>Zingiber</i> |

Registration of New Heliconia Cultivars

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(Originally published in two parts in Heliconia Society of Puerto Rico Newsletter, December 2000 and December 2001)

The introduction of new heliconia species and cultivars to Puerto Rico has been increasing steadily over the past 40 years. This increase has been especially notable in the last few years, due primarily to interest created follow-

ing the founding of the Heliconia Society of Puerto Rico in 1996, and Zingiberales Gardens in 1997. At present, there are at least 282 different types of heliconias flowering in Puerto Rico, and many more recent introductions that are not yet of flowering size, probably bringing the total number of heliconia species and cultivars to over 300 (Jerome, 2005). This trend is certainly occurring in other areas of the world where heliconias are grown, such as Australia, Thailand, Colombia, Malaysia, Hawaii, Florida, and others.

The great increase in diversity of heliconias in Puerto Rico, combined with an abundance of pollinators, especially hummingbirds, creates the ideal situation for the development of new natural hybrids. In a tropical environment such as Puerto Rico, heliconias readily set seed and produce volunteer plants as seeds are disseminated and germinate. In addition to naturalized volunteer plants, many growers are also using seeds for heliconia propagation. Recently, several members of both heliconia societies have reported observing new heliconias that possibly represent natural hybrids, natural genetic recombination, or natural mutations. New, attractive heliconia cultivars have potential value as novel cut flowers and ornamental plants. Cultivar registration is a process by which the originator of a new cultivar creates a permanent record of the new plant, allowing standardization of the cultivar name and giving credit to the originator.

Taxonomy Basics

A cultivar, or cultivated variety, is a descriptive term for a plant population with a distinct genetic composition and unique characteristics that allow it to be distinguished from other members of the same species. The International Society for Horticultural Science, which coordinates cultivar registration worldwide, defines cultivar as "a taxonomic group of cultivated plants that is clearly distinct, uniform and stable in its characteristics and which, when propagated by appropriate means, retains those characteristics" (ISHS, 2006).

Although the terms "variety" and "cultivar" are sometimes used interchangeably, there is an important difference. Variety refers to a natural population of plants that differs in some distinguishable way from the typical species. It is a botanical term, and thus is written in Latin in lower case letters and italicized. For example, individuals of *Heliconia indica* var. *micholitzii* may be distinguished from individuals of *Heliconia indica* var. *rubricarpa*, and both varieties may be distinguished from the "typical" individual of *Heliconia indica*. A cultivar, on the other hand, is a cultivated population of plants that differs in some distinguishable way from the typical species. A cultivar name is not written in Latin and is not italicized, but instead is a name in a modern language beginning with a capital letter and designated by single quotes (for example, (*Heliconia angusta* 'Orange Christmas')). The abbreviation "cv." preceding the cultivar epithet was permitted prior to 1996, but is not allowed by the rules of the latest International Code of Nomenclature for Cultivated Plants (Brickell et al., 2004).

Individual plants within a cultivar are generally more genetically similar than those within a variety. Some types of cultivars may have slight genetic differences, such as in the case of seed propagated grain, legume or vegetable cultivars. Other types of cultivars, which are clonally

propagated, have members which are genetically identical.

Clonal propagation is the production of "daughter" plants from one original "mother" plant. This can be accomplished through grafting, division of mother plants, or tissue culture. Clonal propagation is typically practiced with many fruits and ornamentals. Thus, all 'Valencia' orange trees (*Citrus sinensis* 'Valencia'), all 'Red Delicious' apple trees (*Malus domestica* 'Red Delicious'), and all *Heliconia caribaea* 'Black Magic' plants are clones of a single original mother plant. Seedlings from a named clone, although similar in appearance to the mother plant, will have different degrees of genetic difference from the parent cultivar, just as each child in a human family shares genetic traits with parents, brothers and sisters, but is unique. For this reason, seedlings resulting from *Heliconia chartacea* 'Sexy Pink', even though they resemble the parent, are not actually 'Sexy Pink', just *Heliconia chartacea*. This distinction is important, as through the years considerable genetic change can occur with seed propagation, leading to confusion when it comes to identifying a cultivar, and different clones with the same cultivar name.

Cultivar Registration

Registration of new cultivars of any crop is important for several reasons. One of the most important reasons is to permanently document a description, preferably with a color photograph, so that a given plant can be properly identified. For example, if new genetic combinations from seed propagated heliconia cultivars arise, it would be easier to distinguish the original cultivar from the new variants if a published description exists. A properly documented cultivar name is also less likely to be renamed by somebody else as yet another new cultivar, further adding to the confusion. Correct cultivar identification is extremely important when purchasing expensive plants from local nurseries or through mail order, as unpleasant surprises can otherwise result.

By registering new cultivars of heliconia or any plant, the originator creates a permanent record for that cultivar, with the goal of standardizing the name to avoid future confusion over a plant's true identity. The originator also receives credit for the contribution.

New plant cultivars are registered by International Cultivar Registration Authorities (ICRAs). ICRAs are appointed by the Commission for Nomenclature and Registration of the International Society for Horticultural Science, and must operate within the provisions of the International Code of Nomenclature for Cultivated Plants (Brickell et al., 2004). There are currently 72 ICRAs responsible for registration of new cultivars in different "denomination classes", or taxonomic groups, covering over 4,000 plant genera. Other functions of an ICRA are to reject unacceptable cultivar names, maintain a checklist of all known cultivar names within their denomination class, and publish checklists of new cultivars periodically.

Until 2003, the only genera of the order Zingiberales which could be registered with specific ICRA's were *Canna*, *Curcuma* and *Hedychium*. The ICRA for *Curcuma* and *Hedychium* is the Singapore Botanic Gardens (Clury Road, Singapore 259569), established in 2000 (See [http://](http://www.ishs.org/icra/)

www.ishs.org/icra/). The ICRA which accepts *Canna* registrations is the Royal General Bulbgrowers Association (Postbus 175, NL-2180 AD Hillegom, The Netherlands), and was established as an ICRA in 1955. The Heliconia Society International (HSI) was officially recognized as the International Cultivar Registration Authority (ICRA) for *Heliconia* on 1 August 2003. In the absence of a specific ICRA for other Zingiberales, the Royal General Bulbgrowers Association would probably be the most appropriate ICRA for registration of new cultivars, as its denomination class is "bulbous, cormous, and tuberous-rooted ornamental plants".

Before the registration process begins, a name must be selected for the new, unique plant. As was mentioned previously, a cultivar name, or epithet, is written in a modern language and written with single quotation marks. The name must also be unique within its denomination class. A series of guidelines and restrictions for cultivar naming is available at the ICRA website (<http://www.ishs.org/icra/>).

Once a name is chosen for the new cultivar, a registration form must be completed and submitted to the appropriate ICRA. Registration forms and fees vary among the different ICRAs, but typically the forms request the following information: names and addresses of the originator (who developed or discovered the cultivar), the nominant (who named the cultivar), the introducer (who distributed the plant privately or commercially) and the registrant (who is registering the new cultivar name); previous publication of the cultivar name (if applicable); the cultivar epithet; the parentage (when known); the location of the original find; details of trademarks, patents or plant breeder's rights (if applicable); awards received; a detailed description including a photograph or drawing; preferred method(s) of propagation; and an explanation of the meaning of the cultivar epithet. The registration form for new heliconia cultivars is available online at http://www.heliconiasocietypr.org/cultivar_registration.htm, or by regular mail from the registrar. There is no fee for registration of heliconia cultivars.

The registration process is not complete until the new name is published in a printed form available to the general public. The publication must be dated, such as a technical journal or a nursery catalog. Newspaper and magazine articles, non-technical publications, websites and CDs are not acceptable forms of publication. The new cultivar name and description will eventually be published by the ICRA, at no cost to the registrant other than registration fees, if any. However, if the chosen name is submitted by someone else and published first, another name would have to be chosen. To assure a desired cultivar name, the registrant should publish a variety description in a recognized journal, such as the Bulletin of the Heliconia Society International, HortScience, or the Journal of Agriculture of the University of Puerto Rico. The publication must include a complete description of the cultivar, stating its obvious characteristics and how it differs from existing cultivars, preferably with an illustration or photograph.

By following these steps in cultivar registration,

the originator receives deserved credit for the development or discovery of the new cultivar. Furthermore, a permanent record documenting that cultivar is created, which is necessary to avoid the confusion which is all too common in the ornamental plant world.

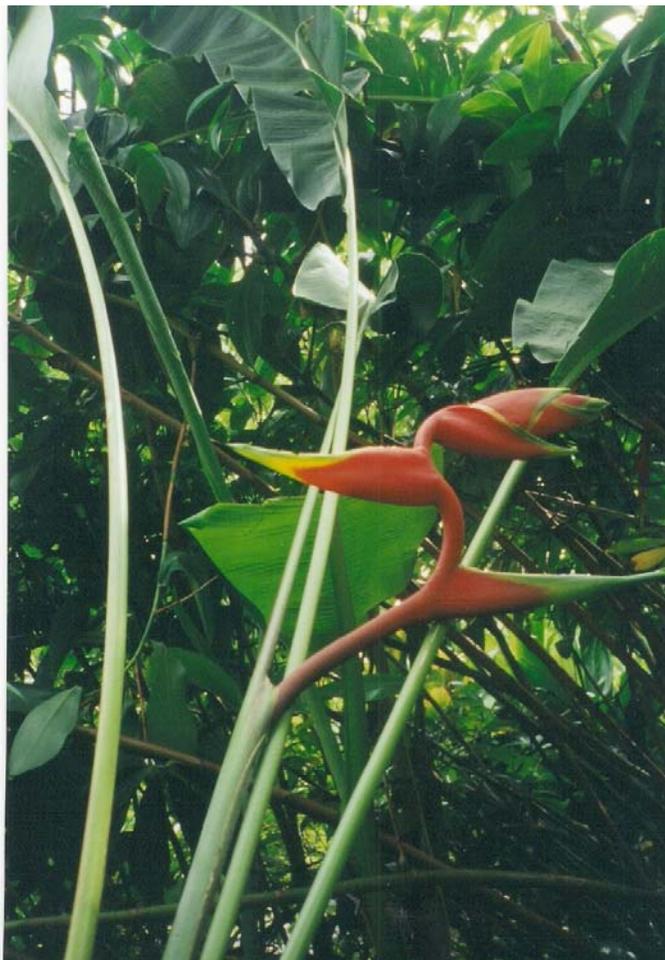
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Registration of *H. 'Puerto Rico Libre'*

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'Puerto Rico Libre' (*H. bihai* × *H. rostrata*) Registered 10 June 2006. Registrant/Nominant: L. Haring, HC05 Buzón 9987, Río Grande, Puerto Rico 00745. Description: Inflorescence initially erect, becoming pendent and sinuous; 11 to 12 distichous bracts, red with



H. 'Puerto Rico Libre'



H. 'Rauliniana'

dark green distal lip subtended by yellow, 3.8 cm wide, 13.5 cm long; rachis red; sepals white with pale green lip. Bract interior gold, fading to white proximally, with green distal lip bordered with yellow. Floral sheaths pale yellow; ovary grayish white, pedicel white. Lowest bract mostly green distally. Vegetation musoid; leaf blade 28 cm wide, 120 cm long, green with light green midrib. Height 3.7 m. Blooming from March to June in Puerto Rico. Notes: Occurring as a spontaneous seedling near clumps of *H. bihai* and *H. rostrata*. Similar to *H. 'Rauliniana'*, but with shorter bracts ('Rauliniana' bracts 17.9 cm long), darker green distal lip with more defined yellow border ('Rauliniana' with pale green lip subtended by pale yellow along entire bract), interior of bract proximally white ('Rauliniana' light red), and floral sheaths pale yellow ('Rauliniana' light red). Named in gratitude for Puerto Rico as adopted country.

The 4th International Symposium on the Family Zingiberaceae 3-6 July 2006

The symposium commenced on 3 July at the brand new Tanglin Complex of the Singapore Botanic Garden (SBG), which now houses offices and the library. We were the very first event at this complex, and were surrounded by (but not bothered by) ongoing construction. 187 ginger enthusiasts attended the symposium, which had 49 oral presentations and 36 posters, covering the whole range of ginger research, from plant exploration, to molecular analyses resulting in new phylogenies and nomenclature, to pollination biology (the sliding pollen of *Caulokaempferia* was especially interesting), ecology, floristics, ethnobotany, propagation, breeding, essential oils, health and cosmetic products, medicinal uses, even botanical illustration and photography. Alan Carle, a former HSI president, detailed the formation of the SBG's Ginger Garden. John Kress, another former HSI president, explained the recent molecular work and incipient major reorganization of parts of the Zingiberaceae. If you've long thought that *Alpinia* was sort of "all over the place", you'll be happy to know you were right. However, if you are the person who labels plants in botanic gardens you won't be so happy to know that henceforth *Alpinia* will be a small genus of species re-

lated to *A. galanga*, and everything else will need a new (or old) name. You might postpone buying expensive labels for your *Alpinia* accessions. Over half a day was devoted to *Curcuma* alone, which also may see some extensive renaming in the future.

The next symposium is scheduled for 2009 at the Xinxuanbanna Botanic Garden in southern Yunnan, China, to be organized by Dr. Li Qing Jun.

The staff of the Singapore Botanic Garden, under the direction of Dr. Chin See Chung assisted by Dr. Benito Tan, were superb in organizing and hosting the conference. If there were any glitches they were barely noticed by the participants. The staff interacted warmly and personally with the participants, making us all feel quite at home. We'll never forget the morning and afternoon "teas", which were more like mini-lunches, with a whole buffet of tasty morsels. Singapore is a great place to meet.

Ray Baker

Tapeinochilos: Out from the shadows and into the light!

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David Warmington, Flecker Botanic Gardens, P.O. Box 359, Collins Avenue, Edge Hill, Cairns, 4870, Queensland, Australia. Phone 61-740-502402

Have you ever wondered ?

The fact that many members of the genus *Tapeinochilos* are largely ignored and seldom cultivated in the gardens and landscapes of botanic and private gardens in the tropic regions of the world is readily attributable to their unquenchable thirst for water and demands for space to spread, coupled with poor seed-making properties and rhizome re-generation being relatively slow and finally transport (distance) considerations.

In regards to their fellow Zingiberales bretheren, the Heliconiaceae, their demands too are somewhat similar to *Tapeinochilos* spp., so how can it be that *Heliconia* spp. for the most part, are readily encountered around the world's gardens and are eagerly traded and much sought after by HSI enthusiasts, cut-flower growers, gardeners (among others) causing their popularity to endure-whereas this hasn't been the case for *Tapeinochilos*?

Heliconia vs *Tapeinochilos*- the problem.

The main factors are readily available seeds, long-lasting qualities of the same, many of which are distributed from Puerto Rico private enthusiast's gardens and a few other countries, but more so because of the ease in which rhizomes can be excavated (from the said plants) cleaned and packed and shipped around the world with relative ease. Indeed this has readily occurred with examples of thriving nursery businesses providing the same from Hawaii USA to Australia and to a lesser extent Singapore and Thailand in South East Asia.

So it is mostly because of the ease with which *Heliconia* spp. can be dispersed that serves as the main

reason for their successful introduction into so many gardens around the world, both in tropical zones but in the case of some *Heliconia psittacorum* cultivars also into Northern United States and to a lesser extent European countries, like Netherlands, UK and Germany where they may be encountered as potted annual plants sold for summer color!



T. holrungii

So where does that leave *Tapeinochilos* ?

Firstly, the availability of seeds of many species are very limited and the only regular seed sources are those from private gardeners/collectors in Far North Queensland and especially. Flecker Botanic Gardens in Cairns, Australia. There is somewhat of a reluctance to distribute seeds because of time/work constraints within the garden's organisation to manage this, coupled with Australian government export regulations documentation processing which is both time consuming and costly to prepare and thus act as hindrances to the would-be exporter and importer.

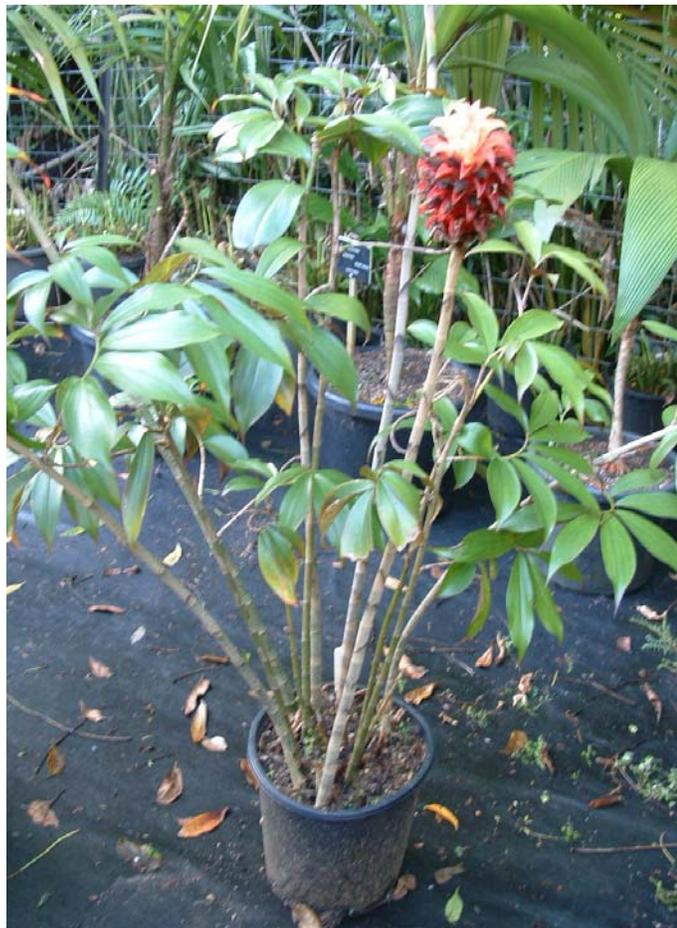
It is true *Tapeinochilos* rhizomes can be excavated and cleaned and exported, along-side that of *Heliconia* spp. rhizomes, but they do not readily recover as well and generally the mother plants (from which they have been cut) suffer to some degree in their ability to re-generate new growth, so this method of propagation cannot be sustained for so long for certain species, especially. *T. holrungii* and it's close relatives, wherein it is a near fatal proposition.

Indeed the best method to re-produce *Tapeinochilos*, given the lack of abundant seeds, is by vegetative means either by division of the stems and/or cutting them up or by branch tips (cuttings) that are laid laterally in a sandy media to root from the nodes, but even with this material being made available, why does it still affect their apparent availability and rarity in tropical gardens around the world?

Environmental conditions a major factor

The key word here is "tropical" - whether one likes it or not. To be able to successfully cultivate *Tapeinochilos* spp. one must be living in a tropical region of the world. To be able to manage it, a gardener/collector in a Northern hemisphere or Southern hemisphere gardening zone, will realistically not be able to achieve it!

There are a few examples of where they are being cultivated, outside of a tropical climate, but it is both a personal struggle to keep them satisfied and healthy and due to the lack of a regular flowering cycle and somewhat ragged appearance of old stems and old leaves their value as cultivated subjects, is somewhat diminished (Tom Wood, Archer via Gainesville, Florida. USA- pers comm.). Thus to see them growing outside of their normal range is somewhat of a disappointment to the would-be *Tapeinochilos* enthusiast. In one sentence- up and move to a tropi-



T. recurvatum



T. densum

cal climate zone, if you want to grow them in your gardens!

The main species one will see, in relative abundance around the tropical zones of the world and some great European glass houses is *Tapeinochilos ananassae*, specifically the variety from Moluccas, which is readily recognised from its New Guinean and Australian counterparts by the bright red cataphylls (bracts wrapped around the stems) which remain red for a short period of time when first flushing of new stems occurs, coupled with the broader flatter rounded flower bract which often is discolored to lighter red and almost pink shades, attributable to lack of fertilizers or poor soil conditions. The fact that this species is the one most readily seen by enthusiasts serves as a reminder that indeed this genus exists and hopefully will endear the genus to more gardeners and enthusiasts alike, because in its own way it serves as an ambassador for the genus through which most of us have become acquainted with *Tapeinochilos*. So why is it the only one seen around still?

Well the fact that it has been in steady cultivation for the past 100 years or more Indonesia may be a factor, (Gregori Hambali, Bogor, Indonesia- pers. comm.) and also that it is used in some instances as a cut flower in Philippines and Malaysia, and Australia and to a lesser extent in other South East Asian countries, such that people inevitably will notice it in a floral arrangement somewhere and their enquiries will eventually lead them to the plant. One can see it sold in excavated clumps in bloom in Chatujak Markets in Thailand, when the flowering season is on!

The main reason one doesn't see the other species presented in this manner is that they are relatively recent arrivals in the tropical horticultural scene and are still yet to be established in public and private gardens and enthusiasts' collections and even in cut flower growers' production groves.

Other species of *Tapeinochilos*

The two most promising and likely successors to *T. ananassae* are *T. x densum* and *T. recurvatum*, because of their relative ease of cultivation and also regular flowering cycles which are intermittent all year long, plus they are relatively hardy and do tolerate drying out a bit better than other species and also that they can be cultivated in large containers and thus can be transported around with relative ease.

T. x densum presents an interesting case because it has traits of both *T. recurvatum* and *T. hollrungii*, leading to speculation that it may be a natural hybrid between the two species and interestingly is never known to have set seeds (in cultivation or the wild). Furthermore it is not known if it exists in the wild state anymore because of so much degradation of surrounding forest- where it once occurred. In reality it is quite a rare plant in this sense and by seeking to cultivate it is actually contributing to its conservation, in effect it is the only way to preserve this species now! (Dr Osia Gideon, Port Moresby, Papua New Guinea- pers comm.)

T. recurvatum has the unusual trait of producing multiple inflorescences from one point, which is not common across the genus, only shared perhaps with *T.*

kaulkmannii. Also because it has a two-tone effect of colorful bracts that are crimson to begin with (but they lighten to pink as they mature) ensures a pleasant color combination that is both pleasing to the eye and exciting for florists and or cut flower aficionados.

The two giants of the genus, as far as swamp-loving members are concerned, *T. dahlii* and *T. palustris* are to a lesser extent cultivated by some enthusiasts but on account of their enormous bulk, and insatiable demands for water, are not seen often nor cultivated so successfully. As an example, one stem alone of *T. dahlii* would hold approximately 10 litres (plus) of water in order to remain in an upright state. That is equivalent to one regular household (laundry) bucket of water. Now think, how many stems there are on a regular mature (flowering size) *T. dahlii*? at least 10 or more! So how many gardeners are going to be able to provide that much water (daily) to keep a



T. dahlii

species like these two happy? Not too many.

Again, unless you have a garden nearby a swamp or permanent water source like a stream or creek or pond, to even attempt to grow these two species and flower them successfully, is at best, wishful thinking.

The colors of these two species are not exactly eye catching, rather they are the opposite! *T. dahlii* bracts color are actually very dark purple to black (although there are red bracted forms seen in nature) and *T. palustris* is a bizarre combination of dull olive green to gray and in some cases darkens to brown, at best is appreciated from a distance! The only way to effectively promote them is to place them in a floral arrangement alongside more colorful members of their kin, and because of their

moody/subdued colors, they will stand out, but to place them in a situation of muted greens alone would all but render them lost (Mrs. Liz Johnston, Brisbane, Australia-pers. comm).

Often people will come up to specimens in bloom in the Flecker Botanic gardens and remark "What is that dead thing attached to that plant?" or "Why don't you cut off that ugly black thing?" Alas –if they only knew!

Amazingly, the record for the longest lasting inflorescence in continual growth, goes to *T. dahlii*. A specimen in Flecker Botanic gardens was estimated to have retained its inflorescence for well over a year. Now that's flower power! (D. Warmington– pers. comm.)

Unfortunately these keeping qualities aren't reflected in their vase life (as a cut flower) and for the most part *Tapeinochilos* "blooms" do not keep well, at room temperature is best, but they only tend to stay on for about a week at the most. To put them into a refrigerator is fatal. The bracts will literally discolor over night and they will not revert back again to their former color. This was a cautionary tale from a well meaning, but misguided florist friend of mine! Fortunately for *T. dahlii* and/or *T. palustris* one would barely notice the effects of cold storage damage!

(Joseph Noli, Mossman, Australia- pers. comm)

***Tapeinochilos* as potted plants**

As far as potted specimens are concerned for *Tapeinochilos* we only have a few species with which to fall back on, and in the present time only *T. brassii* is becoming available, although there are a suite of similar



T. brassii

species to it but they remain largely unavailable due to their inaccessible terrain in the wild state.

Flecker Botanic gardens has maintained potted specimens in both 8 inch, 10-12 inch and gallon containers and *T. brassii* is content to exist in these containers for the period of its lifetime, but as they become too bulky their stems will cause the pots' sides to warp and thus signal the need to move them up a size.

Also *T. recurvatum* and *T. x densum* are able to be maintained in a similar fashion, i.e. pot bound, although a gallon sized container (plus) is best used to keep them in a strong and regular flowering state. Their stems will exceed a meter or so, but inflorescences will remain at eye level or below, and because of their intermittent flower cycle there will always be some one of them in bloom!

Unfortunately for *T. brassii* it is a strictly a cyclical bloomer and only retains interest when in bloom, its inflorescences are borne basally and literally rear up from under the ground (of course they are attached to the parents' rhizome) but always they sit some distance from the stems.

Ideally a wider bowl-shaped pot, which compromises depth for width, is the best container to use. The bracts are a fiery-orange to red and are interesting to observe, when in bloom, but sometimes the overhead foliage (being on the lush side) may tend to obscure them when looked down upon from above. The stems of *T. brassii* seldom exceed a meter in height, making it amongst the smallest species of the genus!

A quasar that will never be!

The prize for the widest variation in color form (of bracts), goes to the species *T. hollrungii*, ranging in colors varying from dark crimson to almost dark purple, and then there are scarlet and red shades and then there are orange and yellow shades, in fact the full color spectrum of *Tapeinochilos* can be seen in this one species. Not surprisingly perhaps, is that it occurs widely over a great range of altitude and terrain types within the island of New Guinea, but unfortunately it has the reputation for being the most difficult member to grow and seldom thrives in cultivation. All sorts of soil remedies and site improvements can be made but to some extent the plant will not respond to such treatments. In the end, the plant will stay in a constant quiescent state - not dying off, but not growing either! To attempt to excavate one is often a fatal experience for it.

Numerous attempts in the early years of 1980's were made with cultivating *Tapeinochilos hollrungii* particularly, and resulted in members of HSI both in Australia and Hawaii USA competing to develop a strategy that would lead to their eventual acceptance and appreciation as garden subjects and as "collectibles" in the floral trade and exploitation of blooms for the same. (Mr. Alan Carle, Mossman, Australia – pers. comm).

As such *T. hollrungii* was chosen to symbolise this scheme, on account of its spectacular dimensions of inflorescence and the wide color range known. In fact, the name "Quasar" (flower) was coined to reflect the almost surreal, exploding star-like character of the bloom of *T. hollrungii*, for the gory title of Backscratcher ginger (as *T. ananassae* is known by in Australia) proved less than flat-

tering to the buying public. Whilst the new found name was promising, the choice of candidate to model it could not have been more unwisely chosen. (Mr. Mark Collins, Hilo, Hawaii, USA- pers comm.)

One reason would be that its' flowering cycle is strategically positioned to be a "once-off" (but glorious) life time event. Whilst the plants are very long lasting in an immature state, *T. hollrungii* only ever blooms when the factors of light and water and environmental conditions are suitable to sustain a bloom over a long period of time, and when all these factors are aligned such that its secure, only one stem (from the whole plant) will commence flowering. Once it does, the bloom will stay on for a year or more and the effort to maintain it will all but exhaust the parent plant and often it is at the cost of the plant's life. So why employ such a terminal flowering strategy? Well if seeds are set successfully, they will number in their hundreds of thousands and be dispersed far and wide in the forest under storey thus ensuring at least one of the progeny will replace their parent, the objective has been achieved.

Why this strategy seems to be prevalent with *T. hollrungii* is not known. All of the other species thus known and grown in a cultivated situation do not employ this method. For the most part they have a multiple flowering stem habit and are intermittent and cyclical bloomers, not terminal in the case of *T. hollrungii*. Also they do not



T. ananassae - red veins

produce such a large or long lasting inflorescence as *T. hollrungii* does.

The axiom "the bigger they are the harder they fall" is certainly applicable in this circumstance and so in a sense "Quasar" flowers (as exploding stars that eventually wither and die) is not altogether an inappropriate name after all.

Leaves can be pretty too!

Aside from floral characters, there isn't a lot one can say is attractive about a *Tapeinochilos* plant when not in bloom. Unfortunately having such soft foliage as they do, they will always inevitably be eaten or attacked by some marauding insect or animal, and the stems being succulent and watery (and sometimes slightly sweet) endear them to all sorts of creatures to munch on- as well as

us humans! They can sustain one's thirst in a forest, whenever water is otherwise unavailable and from the author's experiences trekking through New Guinea, the stems have proven to be useful on more than one occasion to sooth a parched throat.

In a cultivated state, a degree of foliage (for decorative purposes and appearance) can be maintained, but naturally the leaves will mature, discolor and drop off, such is their nature and furthermore the stems will get brittle, snap off, sometimes dry out and the side branches, especially coming off the leafy portions of the stems will always shed or dry off as the surrounding environment dries up or water suddenly becomes unavailable to the plant. I figure this is a survival mechanism, for in extremes of drought, *Tapeinochilos* can all but defoliate and dry out their stems at the cost of keeping the rhizomes replenished with fluid and thus protected, and certainly it is not a pretty sight to see!

In defense of *Tapeinochilos* foliage there are some interesting attributes, for the species *T. x densum* and *T. valetonii*, the reverse side (underside) of the leaves are



T. palustris - stems

heavily streaked maroon and sometimes dark purple, and in their own way are attractive and complimentary to the plant, not to mention diagnostic for the species, when not in bloom!

Some forms of *T. ananassae* from West Papua have red coloured undersides to their foliage which is not at all present in forms from Moluccas and Australia. Furthermore, there can be some red banding at the junction of where the leaves connect to the stems and this is

noticeable in the West Papuan forms of *T. ananassae*, particularly.

Finally, and continuing on a foliar theme, there are the stems and cataphylls (stem leaves) which are decorative and distinctive in some species. In the case of swamp loving species like *T. palustris*, *T. dahlia* and *T. novae-budaensis*, their cataphylls are very thin and "onion skin" like in texture and if they remain attached to the stems for a period of time they cloak them in impressive collars that serve to enhance the rigidity and columnar form of the stems, whereas the other species like *T. ananassae*, *T. brassi*, *T. pubescens* and others, have stems that are cloaked in papery, parchment brown cataphylls that curl and dry off as the stems expand and so unfurl in scrolls like that of cinnamon quills! Truly these are not spectacular traits that can be singled out horticulturally-wise, but do demonstrate some natural characters between the two pre-dominant groups of *Tapeinochilos*, those demanding permanent water conditions and those that do not.

In Conclusion

It is hoped that sympathies of fellow HSI enthusiasts can be aroused towards finding out about *Tapeinochilos* if for no other reason than to realize that they do exist, and to try and grow them as horticultural subjects to aid in their dissemination around the world's tropical gardens- as a noble cause. For as a group, within the Zingiberales, they will always remain poor cousins compared to their "flashier" brethren of Heliconiaceae and Zingiberaceae, but spare a thought for them next time you see *T. ananassae* in full bloom and wonder to yourself what it would be like to try growing the other 20 or so species thus far known. With 14 of those already in cultivation, the dream is practically achievable.

Acknowledgements.

Mr. Dave Warmington, Dr. Osia Gideon, Mr. Tom Wood, Mr. Mark Collins, Mrs. Liz Johnston, Mr. Gregori Hambali, Mr. Alan Carle and Mr. Joseph Noli.

The 14th HSI Conference in Darwin, Australia 26-28 June 2006

Travelers were wise to follow Jan Hintze's advice to "book early" for flights to Darwin, where the middle of the "Dry" is the height of the tourist season in Australia's North End.

Saturday offered a pre-conference tour of Litchfield Park, with first a stop at Howard Springs to feed the barramundi. Along the way our guide, Ian, filled us in on local lore, politics, and tall tales that, had they come from someone less sincere, we might not have believed. We stopped several times to take pictures of endemic palms (*Livistona humilis*), cycads (*Cycas armstrongii*), areas of controlled burns, and termite mounds – both magnetic and cathedral. Before reaching Litchfield we boarded a boat on the Adelaide River to see the jumping crocodiles. Finally reaching Litchfield we stopped at Wangi Falls for hiking and Florence Falls where some were able to take a dip. On our return trip to Darwin the sun treated us to a fantastic sunset.

On Sunday, while the board of directors met, others toured nurseries in the area. An evening of registration and drinks around the pool followed.

Monday opened the conference proper. Following a welcome by conference organizer Jan Hintze and HSI President Anders Lindstrom, Ray Baker presented Chelsea Specht's revision of the genus *Costus*, in which she splits out three new genera: *Cheilocostus* (Asian), *Chamaecostus* (small, American), and *Paracostus* (2 species – African and Bornean). Doris Marcsik spoke on the results of the breeding of gingers for Northern Australia, as part of her work with the Department of Primary Industry, Fisheries and Mines (DPIFM), followed by Heather Wallace's (also from DPIFM) talk on the ginger boring moth, *Conogethis* sp. After lunch Bruce Dunstan shared his Ecuador adventures. Mark Hoult of DPIFM covered *Heliconia* nutrition in relation to northern Australia soils. Dave Lorence explained the HSI Conservation Centers, and Ray Baker gave Bryan Brunner's report on the new *Heliconia* cultivar registry (see the HSI Bulletin 12(3/4), December 2005). Monday evening the Flower Growers and Nurserymen of the Northern Territory hosted a huge barbecue at Kathy Hassell and Jenny Bailey's Flower Farm and Nursery, supplying tons of pot luck dishes and a large variety of local meats on the barbie, including crocodile, water buffalo, and kangaroo. Entertainment included didgeridoo playing, dancers, and door prizes for the lucky. All we visitors had to do was stop by the biggest drive through bottle shop you've ever seen and pick up our drinks for the night.

On Tuesday we toured the Darwin Botanic Garden and the Berrimah Experimental facility of DPIFM. We stopped at Ian Hennessy's flower farm and tissue culture laboratory for a delicious lunch, while a pair of beautiful Jabiru (Black-necked Stork) fished for their lunch in the nearby pond.

On Wednesday Charles Lawson spoke on legal issues concerning plants (patents, etc.), which came across as quite interesting (believe it or not) and stimulated lively discussion. Anders Lindstrom talked about the past and future of HSI, and Doris Marcsik elaborated on her *Curcuma* breeding research. Jeremy Powell, who started the DPIFM program of ginger and heliconia research at Berrimah gave a brief historical synopsis. After lunch the session started with the logo design winner for the North Australian Cut Flower Group, and Ben Hoffman spoke on the group's past and future. Alan Carle portrayed a dismal picture of pending regulations that would severely restrict the entry of new plants into Australia. Finally, Bruce Dunstan took us on a tour of the Solomon Islands. The night ended with a great buffet dinner at the Gardens Golf Course, followed by the traditional auction which netted HSI \$1417.50 (US) (1890 AU).

Early the next morning twelve of us took the 3-day, 2-night post-conference tour of Kakadu National Park and Edith Falls (near Katherine). Our guide Steve was personable, knowledgeable, and able to keep us on schedule while handling unexpected emergencies. And he could cook. We stopped at Window on the Wetlands, Corroborree Billabong for a boat ride that included excellent viewing of fresh water and salt water (estuarine) crocodiles and birds galore. Along the way we saw more termite mounds,

more waterfalls (with swimming and hiking at Gunlom in Kakadu and Edith Falls in Nitmiluk National Park), aboriginal rock art (and a splendid sunset) at Ubirr, visited Bowali Visitor Center and Barramundi Gorge, and had an amazing boat ride through the Katherine Gorge. The first night we camped at Jabiru and the second at Katherine, both nights in comfortable screened tents with cots, and dinner in a screened mess hall.

Although only 42 people registered, the conference was definitely worth attending and the pre- and post-conference trips gave us a much better feeling for the natural history and aboriginal culture of Northern Australia. The location of the next HSI conference in 2008 is still being considered by the board. Current prospects are Costa Rica, Miami, Washington DC, and Hawaii.

Ten of us went on to Singapore for the 4th International Symposium on the Family Zingiberaceae, where we joined other HSI members to learn about cutting edge research in the Zingiberaceae.

**Ray Baker, with help from
Jan Hintze and David Lorence**

Peruvian Amazon Heliconia Expedition

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Photos by Raymond Jerome & Sergio Tejedor

In May of 2001, six very excited heliconia enthusiasts from Puerto Rico joined together to make a heliconia expedition into the northern Peruvian Amazon jungles between Ecuador and Colombia. The expedition was arranged by Margarita Tours of Ft. Lauderdale, Florida. They make about twelve expeditions per year into this region and are very experienced with extremely qualified naturalists in charge of each expedition. Their tour boats are very comfortable and they always have an excellent chef preparing the meals.

We flew from San Juan, Puerto Rico to Lima, Peru, via Miami, Florida. From Lima we flew into the jungle city of Iquitos, Peru. Iquitos is a large jungle city, population about 35,000, that is located on the banks of the Peruvian Amazon River which is about three (3) miles wide at this point. There are no roads or highways into or out of Iquitos. The only way to enter or leave the city is by airplane



"Rickshaws" in Mazan

or by boat down the Amazon. Our tour guide and naturalist, Dr. Devon Graham, met us at the Iquitos airport, helped us to clear customs, and took us to a very nice small hotel in Iquitos where we spent the first night. The next morning we loaded our “gear” aboard a large motor boat and crossed to the other side of the Amazon. We then proceeded downstream a short distance to a narrow neck of a peninsula that extends for some distance down the Amazon to a point where one of the Amazon’s major tributaries, the Napo River, joins it. We disembarked at the neck of the peninsula and once again loaded our “gear” from the boat into small motorized “rickshaws” that were powered by motorcycles. These motorized “rickshaws” are the primary mode of transportation in Iquitos and the neighboring towns. We boarded these “rickshaws” and proceeded to cross the narrow neck of the peninsula to the second largest town in this area, Mazan, where our large river boat, “The Tucanare” awaited us. By not taking the river route around the tip of this peninsula, we saved one day’s time.



The “Tucanare”

The “Tucanare” had sleeping accommodations for six guests plus those for all of the crewmembers. It had two bathrooms with showers (the shower water, drawn from the river, was coffee colored just like the river.) The chef was unbeatable at preparing wonderful meals for us. There was an onboard refrigerator that held all of the drinking water, beer, and soft drinks that we needed for the entire trip. A heavy-duty generator supplied us with all of our electrical needs and oscillating fans kept us comfortably cool at night. There were, in tow, two motorized skiffs for navigating shallow streams. All of the crewmembers spoke perfect Spanish and Dr. Graham was bi-lingual. While we slept the first night, the “Tucanare” began its trip up the Napo River toward Ecuador. The next morning we awoke to a gorgeous sunrise over the Napo. The sunrises and sunsets over this part of the Amazon are some of the most spectacular that I have ever seen. Almost immediately, as the dawn brightened, we began to see thousands of heliconia plants growing in profusion along the riverbanks. Most of these were *H. marginata* (red/yellow) and *H. episcopalis*. They were everywhere. We were in for many surprises. The first surprise occurred at our very first stop, the first day out. We had crossed the river and gone upstream a little way from Mazan. We had docked at the site of a large growth of *H. marginata*. The inflorescence of one specimen that we found was much larger and longer than all of the rest and we thought that perhaps this was a

H. pastazae, or a cross between *H. pastazae* and *H. marginata*. When we began to examine this plant’s growth characteristics, we were totally surprised. Its rhizome lay almost five (5) feet below the surface of the sandy river bank – almost at the water surface level of the river at this time of year. It was growing at a remarkable depth for any heliconia rhizome. We encountered no other heliconias with these characteristics anywhere else on our entire trip. Just a few yards away from this deep growing heliconia we found growing one of our most spectacularly beautiful red and yellow *H. stricta*. We



Heliconia stricta

found many different *H. stricta* of varying shapes and colors during our trip, but none were as beautiful as our first one. At this first stop, we also found some *H. juruana* and many *H. episcopalis*. Nearly all of these heliconias were growing in full sun, either directly on the river bank or just a few yards inland from the river bank.

On the next day, we went further upstream on the Napo River and stopped at the small settlement of Tuta Pishco. We went uphill past the settlement onto higher ground into a secondary forest. There we found



Heliconia velutina

several new varieties of heliconias that we had not seen on the previous day. In this lightly shaded forest we found what we termed “large” and “small” varieties of *H. velutina* -- based on the size of their inflorescences. Also, we were delighted to find several clumps of the dwarf

*Heliconia tenebrosa**Heliconia 'Giant Sexy Pink'*

purple and green heliconias, *H. tenebrosa* as well as a solid red *H. hirsuta*. In this same secondary forest we found growths of a new variety of huge *H. chartacea* that we called "Giant Sexy Pink." The inflorescences of these plants were the same color as the beautiful and well known *H. chartacea* 'Sexy Pink', but the inflorescences were about five to six (5-6) feet in length. The bracts were longer, more narrow, and more widely separated than those of the well known cultivar. These plants

were also huge, being about 25-30 feet in height.

After traveling all night, the next morning we stopped at the settlement of Fortaleza. It was here, in upland secondary forest that we found several clumps of the

*Heliconia timothei*

rare *H. timothei*. Even though it somewhat resembles a *H. psittacorum*, its growth habits are entirely different. It is non-invasive, grows in isolated clumps only to a height of about three (3) feet. Its buds and opened inflorescences are huge in comparison to the size of the plants, being ten to twelve (10-12) inches across its lower bracts. It is a kaleidoscope of colors ranging through red, pink peach, orange, and yellow. As far as we know this heliconia has not been previously cultivated and we would like to suggest the cultivar name of 'Golden Sunrise'. In the same area, we found growths of the *H. orthotricha* 'She'.

The next day, we stopped at the settlement of Quebrada Huirrima (5 Km. North of the town of Santa Clotilde). There, in dense secondary forest, nestled between white and black water creeks, we found large stands of huge *H. standleyi*, which are the only heliconias that we found that exude a thick clear, mucinous secretion from each bract. It is not known if this mucous is a deterrent to insect pests or an attractor for pollinators. To one side of this large growth of *H. standleyi*, we found what we considered to be an unreported, possibly new, species of heliconia. It was a very large plant with pendant inflorescences reaching to 5-6 feet in length. The red and yellow bracts point in an almost vertical position in the mature inflorescence. Protruding from each bract are numerous and very long florets that look like "shrimp swimmerettes." The rachis twists so that each bract is positioned at about a 95° angle from the preceding one. The photo shows a mature inflores-

*H. sp. nov.* (left), *H. standleyi* (right)

cense of this heliconia on the left next to a mature inflorescence of *H. standleyi* on the right. At first we considered that this plant might be a hybrid between *H. standleyi* and *H. marginata*. However, after further consideration we concluded that this was probably not the case for the following reasons:

1. Neither *H. marginata* nor *H. standleyi* have bracts oriented in such a vertical position.
2. Neither *H. marginata* nor *H. standleyi* have floret extensions as long or displayed like those of this plant.
3. Neither *H. marginata* nor *H. standleyi* rotate their bracts at a 90° angle to the previous one.
4. This heliconia produces fertile seeds that would suggest that it is not truly a hybrid.

For the above reasons we think that this heliconia may be a new species and, since it is presently growing and flowering well in our gardens, we would like for it to have the cultivar name of 'Devon Graham' in honor of our expedition leader who first found it. If the experts deem that this is truly a new species, then we will have to give it a species name as well.

Near this same settlement, at higher altitudes and at a good distance from the river, we found growing either in young secondary forest or open fields numerous varieties of *H. orthotricha*, more *H. stricta* and *H. hirsuta*, and either *H. schumanniana* or *H. fredberryana*— we're not sure which.

On our last day, near the settlement of San Felipe, we found numerous and different varieties of *H. orthotricha*, *H. irrasa*, and *H. velutina* -- including one that we called 'Red Cururay' since it was found on the Cururay River. This later heliconia looks like a variant of *H. velutina*, but it had no yellow, only red, on its inflorescence.

Also seen on the trip were some interesting gingers.

This expedition was fantastic, but the most



Variation in *Heliconia orthotricha*

memorable part of the trip was the Peruvian people and their children that lived along the river. They are all extremely friendly and always offer to help in any way that they can—no payment expected. The men helped us to dig and transport rhizomes and the children helped us gather seeds. The children here, I believe, are unique among children of the world. Throughout this area, we saw, among the children, absolutely no evidence of greed, selfishness, or animosity. Whatever the parents in this region do in raising their children, it should be used as an example to all of the adults of the world on "How to raise children properly."

If any of our readers ever do decide to take a similar trip into this region of Peru, I can guarantee that you will not be disappointed.



HELICONIA
SOCIETY
INTERNATIONAL

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