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EPIPHYTES IN THE ROYAL BOTANIC GARDENS, TRINIDAD.

BY THOMAS H. G. AITKEN

MANY visitors to the tropics are impressed by the rich and varied vegetation which they see on all sides. Particularly impressive are the multitude of plants and vines adorning the tress. Indeed, to the traveller from temperate climes, this lush vegetation symbolizes the wet tropics. Occasional trees may be so laden with these "guest" plants, that they become sites of veritable aerial gardens. In the American tropics, these epiphytes (so-called because they merely cling to the tree for support rather than parasitize and injure it) belong principally to the families Orchidaceae, Bromeliaceae and Araceae; the Cactaceae and Gesneriaceae are represented by a few species each, as are the ferns and a few other smaller groups. While the flora of Trinidad is not as rich as that of the mainland, there are, nevertheless, many representatives of the first three of these families in the island, the approximate figures being 179 indigenous species of orchids, 57 bromeliads and 35 aroids. Not all of these are epiphytes, however, some species being terrestrial in habit and a majority of the Araceae are terrestrial or climbing plants.

The Royal Botanic Gardens in Port-of-Spain, do not have an over abundance of these aerial plants, but because of their accessibility to residents and visitors alike they serve as an excellent place for the study of this interesting group of plants. Most of the species have sufficiently characteristic foliage that they can be identified quite easily even if lacking flowers.

ORCHIDACEAE

Possibly only two or three of the islands's 179 species of orchids can truly be said to fall in the class of commercially desirable items; nevertheless there is a wealth of material on every side for the interested amateur to indulge his fancy, from tiny miniatures up to large species whose fleeting blossoms are only open for a day or two.

(1) *Epidendrum stenopetalum* Hooker

This and the following species are the most common orchids in the Gardens. The plants consist of three or four rigid stems which, when mature, vary from about 4 to 14 inches in length and are characterized by the rather narrowly linear, short, leathery leaves arising alternately at about ½ to 1-inch intervals along the rigid stem (woody when old). The flowers, one to several in number, are produced at the tip of the stem; they are about ¾ inch across and a lovely pale magenta colour. Most of the time the flowers do not open, being fertilized by ants and going to seed while still closed, a condition known as cleistogamy. Both this and the following species are to be found growing in great profusion on the Sausage Tree near the Savannah Circular Road.

(2) *Epidendrum rigidum* Jacquin

Like the preceding, *Epidendrum rigidum* is a common plant in the Gardens; usually the two species are found together on a heavily overgrown branch. The plants consist of creeping rhizomes, which give rise to scattered, erect stems about 5 inches in length. The leathery leaves arise alternately, and are somewhat broader and lighter green than those of *E. stenopetalum*. The tiny greenish-yellow flowers, about eight in number, arising alternately along a rigid terminal raceme, are largely covered by the green floral bracts.

(3) *Catasetum macrocarpum* L. C. Richard.

Known locally as the "Monkey Cup", this orchid is characterized by its large fleshy pseudobulbs, ordinarily about 6 to 8 inches long. During the wet season, when the plant is actively growing, the new pseudobulbs are covered with overlapping parchment-like sheaths and bear terminally about a half dozen broad, bright green, longitudinally-veined, membraneous leaves. The inflorescence arises on a long stem (about 8 inches) from the base of a pseudobulb. The usual female flowers (about a half dozen) are large and fleshy, yellow and cup-shaped but, at times, three-pronged, green male flowers with a strikingly fimbriated white lip are to be seen. In the dry season, the plant dies down to a cluster of leafless, wrinkled psedobulbs.

(4) *Diacrium indivisum* (Bradford) Broadway

This is a small version of the orchid known as the "White Virgin". The plant consists of four or five thick, cylindrical pseudobulbs about 6 inches long, covered by short discrete leaf-sheaths, and terminating in two or three short, narrow, fleshy, opposing leaves. The inflorescence arises from the apex of the pseudobulb; the stem is about 6 inches long and it bears a terminal cluster of four or five cleistogamous flowers; if the flowers do open, they are white in colour. The Litchi Tree at the northern end of the Gardens supports a number of these plants.

(5) *Oncidium luridum* Lindley

The "Brown Bee" is one of the more desirable local orchids because of its attractive long sprays of flowers which remain fresh for several weeks. A few plants are to be seen in the Gardens; notable are those on a large saman in the ravine northwest of the Bay Tree Avenue. The characteristic large, fleshy, sword-shaped leaves vary from about 8 to 24 inches or more in length and are 2 to 3 inches wide; they are usually dark green and not infrequently speckled with brown. The pendulous inflorescence arises from the base of the tiny pseudobulb on a long stem which is terminally branched and ranges from 2 to 3 feet or more in length. The flowers, arising along the lateral branches, are about an inch across and very pretty with their yellow to yellow-green background on which are superimposed mottlings of brownish-red or purple.

(6) *Polystachya luteola* (Swartz) Hooker

Occasional specimens of this lily-like species are to be found in the Gardens if one searches carefully (there are several on the Litchi Tree.) The plant consists of one to several stems bearing one or more linear leaves (3 to 8 inches long) on tiny, swollen pseudobulbs. The inflorescence, which may be about 12 inches long, arises from the centre of the leaf bases and consists of a simple or branched raceme of few to many, small, greenish-yellow flowers, each about ⅜ inch long and clustered on the apical third.

(7) *Dendrobium moschatum* (Swartz) Lindley

This is an exotic species, originating in India and Southeast Asia. It has been included in this list because a fine clump of the plant is growing in the Sausage Tree near the Savannah Circular road. The plant is characterized by long, creeper-like, woody stems with alternating, two-inch, pale green, pointed leaves. At intervals, clumps of roots are sent out to clasp the branches. The inflorescence consists of a drooping panicle of several very pretty yellowish pink flowers with two dark plum-coloured spots deep inside. Flowering occurs in June and July.

BROMELIACEAE

Bromeliads, or "Wild Pines" as they are called in Trinidad, form a conspicuous part of the island's plant life. Hardly a tree is passed that does not have one or more of these spiky-looking plants clinging to its branches. Some species are so constructed that they are capable of holding considerable quantities of water in their leaf axils. They obtain their nourishment from a variety of organic and inorganic materials which find their way into the water. These so-called "tank" species serve as the breeding grounds of a number of species of mosquitoes, including, in certain parts of the island, an important malaria mosquito. Many other insects as well as other small animals find harborage in the leaf-rosettes of these plants. Bromeliad flowers assume a variety of shapes and colors and those of many species are very bizarre and striking to look at.

(8) *Tillandsia fasciculata* Swartz

This is the bromeliad most commonly encountered in the Gardens. On some of the saman trees the plants are crowded together in great clumps on the branches. The mature plant, which is about 8 to 10 inches tall, consists of a bundle of overlapping, narrow, sharp-pointed, rigid, recurved leaves arranged in a rosette (much like a miniature century plant); they are grey-green in colour. The inflorescence, which is about a foot long and grows out of the center of the plant, consists of a short, robust stem bearing a flat, sword-shaped spike of overlapping bracts that partially conceal the flowers. Sometimes the inflorescence may be divided into two or more apical spikes. In their prime, these spikes are pinkish-yellow in colour, but turn green as the flowering period wanes. Small blue flowers emerge at intervals between the overlapping bracts. Tiny grey plants, resembling spiny sea urchins are commonly seen on the smaller branches of many trees.

(9) *Tillandsia utriculata* Linné

This bromeliad is indistinguishable from *T. fasciculata* except when the inflorescence is present. This has a long thin, erect stem, 2 to 3 feet or more in height, with long terminal flexible branches covered with semi-appressed tubular structures (floral bracts, etc.) from the ends of which emerge small white tubular flowers.

(10) *Tillandsia bulbosa* Hooker

This bromeliad resembles a small onion plant. It consists of a cluster of small (1 to 2 inch) onion-like green bulbs, from which arise strange, green, intertwined, wire-like leaves which are round in cross-section and from 4 to 7 inches long. The pseudobulb, with its encompassing leaves, terminates in a 3 inch long spike (sometimes two or three branched) of closely appressed

bracts from between which arise tiny blue flowers. Unlike the other species discussed here, the make-up of the plant does not permit water to be held in the leaf bases. The pseudobulbs frequently become the nesting sites of certain species of ants.

(11) *Tillandsia flexuosa* Swartz

This is another fairly small bromeliad, about 4 to 10 inches tall, consisting of a whorl of closely appressed, overlapping, narrowly-pointed leaves. The striking thing about the plant, however, is that the leaves are all strongly twisted either to the left or to the right. From the centre of the clump emerges an erect inflorescence on a thin, flexible stem with several long terminal branches, which bear magenta-coloured flowers emerging from the ends of small, outstanding tubular structures consisting of floral bracts and sepals.

(12) *Tillandsia elongata* var. *subimbricata* (Baker) L. B. Smith

This species is not infrequently found in association with *T. utriculata* in west Trinidad but there are few specimens to be seen in the Gardens and most are high in the trees. A mature specimen in flower reaches to much the same height (3 feet or more) as *T. utriculata,* but the species are readily distinguished. *Tillandsia utriculata* has grey, rigid, recurved leaves, whereas those of *T. subimbricata* are pale green and reflexed, so much so that the longer leaves bend sharply at the middle. The inflorescence consists of a slender, erect, yellow stem and terminal, erect branches bearing closely-appressed and overlapping, yellowish floral bracts from beneath which emerge small, purple flowers.

(13) *Tillandsia Gardneri* Lindley

Only one specimen of this small species was seen in the Gardens. The plant is about 6 inches across and 5 inches high; it consists of a rosette of sharply recurved, gray, fuzzy leaves, the lowermost leaves being the most strongly recurved on themselves (a characteristic of the species). The inflorescence hardly extends beyond the leaves and consists of a short, curved stem with a few small spikes bearing deep pink flowers. This species is incapable of holding visible water, except momentarily, as it has no tank.

(14) *Tillandsia juncea* (Ruiz and Pavon) Poiret

This is a small species, infrequently encountered. A plant was seen on the West Indian Cedar in the ravine northwest of the Bay Tree Avenue, and another on the path up to the Lookout. The dense clump of long, needle-like leaves (8-10 inches long) gives the plant a pin-cushion look. The inflorescence, which is little longer than the leaves, consists of a single, or apically-branched, spike of closely appressed floral bracts, from between which arise small violet flowers.

(15) *Gravisia aquilega* (Salisbury) Mez

This is the most common of the two large species of bromeliads to be found in the Gardens. *Gravisia aquilega* can be seen in the saman trees near Government House. The leaves are pale green, spiny-edged, semi-rigid, and grow up to about 3 feet in length and 2 to 4 inches in width.

It is a majestic-looking plant when in flower. The inflorescence is borne at the end of a rigid pink stem about 2 feet long; it consists of several clusters of spiny, green, floral bracts arising from short lateral stems, the clusters becoming smaller terminally. Small yellow flowers are borne among

the clusters of floral bracts. The distinctive part of the inflorescence are the conspicuous, bright pink, reflexed, primary braots which arise below the flower clusters; these may be as much as 6 inches long at the base of the inflorescence.

(16) *Aechmea nudicaulis* (Linné) Grisebach

This is one of the most characteristic bromeliads to be found in the island. The stiff, spiny-edged leaves are strongly curved and overlapping, so that the plant forms an erect tube resembling a trumpet or candlestick; it is about 14 inches tall. From the mouth of the trumpet emerges a striking inforescence on a semi-rigid, pink stem. The terminal portion consists of about two dozen whorls of short, green, fleshy protuberances (modified sepals), from which emerge tiny yellow flowers. Preceding the terminal floral structures, is a cluster of eight to ten, bright pink, primary bracts (each about 3 inches long) which give the inflorescence its characteristic appearance. After flowering the fleshy fruits turn bright red and are very pretty.

(17) Bromeliaceae. Species?

Several large plants of an unknown species are to be seen on the saman trees near the Government House side of the Gardens. They consists of a rosette of a few very long (about 4 to 6 feet) slender, dark green leaves (some reflexed), which bear prominent barbs along the margins. The plants closely resemble those of *Bromelia karatas* Linné, a terrestrial species, but without flowers it is difficult to establish their identity.

ARACEAE

The principal members of this family are the Philodendrons and Anthuriums, many species of which are of horticultural value. Both terrestrial and epiphytic forms occur. Only two native species of truly epiphytic aroids are to be found in the Gardens; however several of the climbing species have been included because of their general interest.

(18) *Philodendron latifolium* C. Koch

This large, dark green-leaved vine is to be seen climbing on the saman trees near Government House, also in the palm grove in the same area. It is perhaps the most common species to be found in the island. The leaves are arrow-head shaped and very frequently have brownish-orange spots caused by a fungus disease.

(19) *Monstera pertusa* (Linné) de Vriese

Similar in habit to the preceding, this species may be recognized by the holes or fenestrations occurring in the oblong-ovate, pointed leaves, the petioles of which have wing-like flaring ridges. It is also to be seen in the palm grove near Government House.

(20) *Monstera deliciosa* Liebman

This highly ornamental Central American species may be seen growing on a tree (*Elaeodendron glaucuns*) by the orchid house. The large ovoid leaves (about 1½ x 2 feet) bear deep serrations around the margin with a number of discrete holes centrally.

(21) *Monstera* sp.

Another exotic member of this genus may be seen growing on palms and other trees in the ravine near Government House. The large elongate leaves (about 1 x 1½ feet) are deeply cleft to the mid rib, producing about ten or twelve serrations on each side.

(22) *Anthurium gracile* (Rudge) Lindley

The plant is characterized by a number of narrow-bladed leaves which spring from short stems almost concealed by masses of fleshy aerial roots which are fastened to the tree. The pendulous inflorescence is inconspicuous but the clusters of bright red berries are a pretty sight after it has gone to seed. This epiphyte is commonly seen on saman.

(23) *Anthurium huegelii* Schott

This species, with its large, somewhat crinkly leaves (about 3 feet long and markedly broadened towards the tips), reminds one of overgrown kale or chard.

These huge plants are to be seen on some of the large saman trees in the ravine near Government House. Also several large plants are growing on the ground in the same area near the gigantic *Prunus sphaerocarus*.

CACTACAE

There are only three species of truly epiphytic native cacti and all are to be found in the Gardens.

(24) *Rhipsalis cassutha* Gaertner

Called Mistletoe or Old Man's Beard, this cactus is a common epiphyte in the island, particularly favouring saman trees. Its branched stems are unarmed and leafless and hang in great string-like clumps several feet in length. The seedling, however, is a perfect little cactus, complete with spines. The berries are white, like those of mistletoe.

(25) *Epiphyllum hookeri* (Link and Otto) Haworth

Called the "Night-blooming Cactus", this plant is readily recognized by its flat, spineless branches. Pretty, rosette-like white flowers (3 to 4 inches across) are borne along the edges of the branches. The ephemeral flowers open at night during May and are followed in June and July by brilliant magenta-coloured fruits.

(26) *Hylocereus Lemairei* (Hooker) Britton and Rose

The "Night Blooming Cereus" is a familiar sight on trees about the island. The stems are triangular in cross-section and spiny. The flowers are large, about 7 to 8 inches across and consist of white inner petals and yellowish-green outer petals. They open only at night and are faded by dawn. May and June is the principal flowering period. The fruit is reddish-purple.

GESNERIACEAE

(27) *Codonanthe* sp.

These are small creeping plants with short, succulent, pointed leaves (about one inch long and reddish at certain seasons) which hang from the branches in dense festoons. They are commonly found on saman trees.

COMMELINACEAE

(28) *Rhoeo discolor* Hance

Known as "Oyster Plant" or "Ladies-in-a-Boat", this plant is primarily terrestrial, (and may be seen growing in the Gardens along the pathways) but occasionally it grows on trees, such as a large saman near Government House. It is readily recognized by its sword-shaped leaves, about a foot long, dark green above and purple beneath. The small white flowers are encased between a pair of purple bracts which are shaped like oyster shells (hence the common names) and are half concealed among the leaf bases.

FERNS

Several species of ferns (native and exotic) are to be seen growing on the trees. Unfortunately I am in a position to say little about them. One that is readily recognized is, however, the tiny *Polypodium polypodioides* (Linné) Watt which grows in dense clumps, creeping between the rugosities of the bark of the samans as well as several other trees. The leathery leaves are about 5 inches long (including stem) with the margins deeply disected into about a dozen lobes. During dry weather the leaves curl up and wither but expand again when moisture becomes available. A much larger creeping fern, quite possibly *Polypodium aureum* Linné, may be seen high up in the samans. The leaves (including stems) reach a length of about 3 feet and are about a foot across at the base and cut up into about a dozen or more deep serrations reaching to the midrib.

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SHORT NOTES AND ISOLATED OBSERVATIONS

Feeding habits of *Pseudoboa*.

ON 28th April 1957 I put five small *Atractus trilineatus* in a cage with a *Pseudoboa coronatus* (about 14 inches long). At 10.11 a.m. the *Pseudoboa* seized the largest *Atractus* which was about 5 inches long and put five coils around it, got its head at 10.21 after feeling around for it, then swallowed it in 4½ minutes. At 10.26 a.m. the *Pseudoboa* took a second *Atractus* which was a much smaller one and swallowed it immediately, got the third by its tail 30 second after and swallowed that, then took the fourth at 10.32. Each of the three smaller *Atractus* was swallowed in 25 seconds.

On 29th April, Mr. H. P. Urich gave me a *Pseudoboa neuwiedii* about 3 feet long. I put it in the cage with the smaller *Pseudoboa*. The next day the larger one swallowed the smaller, then disgorged, killing it.

On 7th May the *Pseudoboa neuwiedii* on seeing a mouse that I had placed in the cage, started to chase it, seemed to get excited and disgorged a mouse that it had eaten the day before, then swallowed it again. It looked around for the live mouse, disgorged again but did not reswallow. At 9.39 a.m. the mouse