

Catasetum and Cycnoches — Part 2 — Catasetums with Unisexual Flowers

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SCIENCE FICTION FANS who have read Ursula K. Le Guin's *The Left Hand of Darkness* will know just what I mean when I say that the majority of catasetums are like the alien Gethenians — sometimes male, other times female, depending on external elements at the time of *kemmer* (flower initiation)! These 90 or more Central and South American species produce unisexual flowers: male (staminate) flowers and female (pistillate) flowers. In each case, organs of one sex are functional while those of the other are not.



Photo: Greg Allikas
FIGURE 1 — *Catasetum integerrimum*

Catasetum integerrimum is representative of those species whose male and female flowers look very much alike. For this reason, it is difficult to determine whether the flowers illustrated in FIGURE 1, measuring 2 inches (4.8 cm) across, are male or female. In any event, both male and female flowers of this species are non-rcsupinate, with their curious, beehive-shaped lips uppermost. Below, the furred lateral sepals shelter the broader petals between them, on top of which the ominous, pointed column is positioned. Only the very tip of the dorsal sepal, lowermost on the flower, is visible in FIGURE 1. The fleshy substance of the floral segments, in combination with their odd shape and arrangement, give the flowers of *Calasetum integerrimum* a monstrous appearance. It is easy to imagine these hooded, winged creatures flying off their perch in search of victims to sting and subdue!

In most cases the sexes are segregated in *Catasetum*, with the male flowers and female flowers produced on separate inflorescences. Inflorescences producing male flowers tend to be longer, more arching and more floriferous

than those producing female flowers. The upright stance of the inflorescence pictured in FIGURE 1, along with the fact that the flowers are clustered at the end rather than spaced out on a longer inflorescence, suggest that it bears female flowers of *Calasetum integerrimum*.



Photo: Beauford B. Fisher
FIGURE 2 – *Catasetum trulla* 'Adagent',
AM/AOS, CHM/AOS

Also, several illustrations in the literature (Bechtel *et al.*, 1981; Teuscher, 1973) picture male flowers of *Catasetum integerrimum* with a distinct pattern of brown spotting over the inner surface of all segments, as well as more outspread lateral sepals than those illustrated here..

Differentiating between male flowers and female flowers is a good deal easier with other *Catasetum* species because, though produced by the same plant, they are as different as night and day! The flowers of *Catasetum trulla*, pictured in FIGURE 2, illustrate the typical form of male flowers of many *Catasetum* species. Unlike those in FIGURE 1, these flowers, measuring 2-1/3 inches (6 cm) across, are resupinate, with their triangular, fringed (fimbriated) lips in the lowermost position. The petals and dorsal sepal, in turn, are uppermost. These three segments overlap in a very characteristic way. Outstretched like wings, the narrow lateral sepals give these flowers the "birds in flight" appearance typical of the male flowers of many *Catasetum* species. The long, narrow column of these flowers, bearing two antennae-like projections positioned over the lip, is also characteristic.

The colossal specimen plant of *Catasetum fimbriatum* in FIGURE 3, flowering in August, illustrates several points about catasetums with unisexual flowers. Though

this surely is about the maximum size possible for a *Catasetum* in cultivation, it does remind us that these species and their hybrids are far from miniature! Pseudobulbs reaching heights of 12 inches (30cm), topped by leaves often 18 inches (45 cm) long, add up to plants 2-1/2 feet (75 cm) tall, or more. The eight long, pendent inflorescences on this specimen plant of *Catasetum fimbriatum*, carrying an average of 18 male flowers each, indicate that floriferousness goes far in compensating for size with these *Catasetum* species.

More open than those of *Catasetum trulla*, the male flowers of *Catasetum fimbriatum* illustrated in FIGURE 3 bring up an important point. Flower form, particularly in the case of the male flowers of these catasetums, is not static, but changes as the flower ages. The lateral sepals often move from a position at either side of the lip (FIGURE 2) to one thrust back nearly at a right angle away from the lip (FIGURE 3). In addition, both sepals and petals tend to curl or fold back with age, assuming a more narrow appearance. All in all, male flowers of many of these *Catasetum* species and their hybrids frequently become increasingly open in form and dominated by their lips as they age.

The male flowers of these *Catasetum* species are highly variable in color. The



Photo: Charles Knapp
FIGURE 3 -- *Catasetum fimbriatum*,
R.F. Orchids', CCM/AOS (92pts)

stripe of color down the center of the lip of *Catasetum India* may be brownish, as is the case with the clone pictured in FIGURE 2, or more reddish. Certain clones of *Catasetum fimbriatum* have a good deal more pink coloration in their sepals and petals than is evident in the clone pictured in FIGURE 3. All this is offered as an explanation for the surprising hybrid illustrated in FIGURE 4, *Catasetum Francis Nelson*, a cross of *Ctsm. trulla* and *Ctsm. fimbriatum* made by The Beall Company and registered in 1974. And yet, highly variable color patterns are typical of such *Catasetum* hybrids.

Catasetum Francis Nelson 'Avis', at the time it was awarded an AM/AOS in 1975, displayed 19 male flowers on one inflorescence, and 4 female flowers on another.



Photo: Charles Marden Fitch
FIGURE 4 -- *Catasetum* Francis Nelson,
(*trulla x fimbriatum*) (male flowers)

FIGURE 5, picturing one male flower and one female flower of this awarded clone side by side, provides us with a wonderful opportunity to compare. The resupinate male flower, on the left, with a natural spread of 2 inches (5 cm), has the open form uppermost position. The sepals and petals of this flower arc strongly reflexed away from the lip, creating a narrow flower 1 inch (2.5 cm) across which appears to be all and large, cupped lip found in so many male *Catasetum* flowers. The female flower on the right, in contrast, is non-resupinate, its large, hooded lip taking the lip. The column of the female flower, too, is quite distinct, being short and wide rather than long and narrow, and lacking the antennae-like projections found on the columns of male flowers of *Catasetum*. Lastly, these flowers are very different in color and patterning. Strangely enough, the female flowers of *Catasetum* Francis Nelson have more in common with the flowers of *Catasetum integerrimum* (FIGURE 1) than with their male counterparts!

While the male flowers of these catasetums vary in size, form and coloration from species to species, the female flowers are remarkably similar for the group, looking much like the female flower pictured in FIGURE 5. They generally are carried on short, fairly upright inflorescences, and are relatively inconspicuous. In fact, the specimen plant in FIGURE 3 has two inflorescences of green female flowers barely visible within the abundant foliage. What determines whether a catasetum produces male or female flowers? The growers of *Catasetum* Francis Nelson 'Avis', once their plant had developed an inflorescence of female flowers, were able to



Photo: Edwin S. Boyett

**FIGURE 5 – *Catasetum* Francis Nelson 'Avis' AM/AOS (82pts)
(male flower, left; female flower, right)**

induce male flowers on a second, slightly delayed inflorescence by moving the plant into a far more shady location

(Aronovitz, 1976). In one scientific study of *Catasetum* and *Cycnoches* species, a significantly higher percentage of female flowers were produced by plants growing in full sunlight than by those grown in partial shade (Gregg, 1975). These reports indicate that light intensity plays an important role in determining the "sex expression" of catasetums. Plants that are grown in full sunlight are more likely to produce female flowers. This does not mean, however, that they will not produce male flowers as well, as is the case with the robust specimen plant that is illustrated in FIGURE 3.

Up to this point, I have given the impression that these catasetums produce either male or female flowers, often quite different in appearance, and neatly separated on inflorescences which themselves are distinct. Unfortunately, catasetums with unisexual flowers are not so easily categorized. On the contrary, when an inflorescence initiates on some plants, just about anything can happen! For example, one grower reported that his plant of *Catasetum barbatum* produced, on the same inflorescence, first female flowers, then male flowers, and finally hermaphroditic (bisexual) flowers! These hermaphroditic flowers exhibited characteristics of both the female and male flowers of the species, similar to those already described (Soukup, 1976).

Not only is the outcome of an inflorescence of a *Catasetum* with unisexual flowers never entirely certain, the timing of its initiation and development is subject to variation. Most catasetums initiate inflorescences from the base of newly matured pseudobulbs, yet this is not always the case. Inflorescences of *Catasetum tenebrosum*, for some growers, initiate in the spring on new growths which have only begun to develop. While other growers have plants of this species which flower more conventionally in the late summer from fully matured pseudobulbs. Plants which have been subjected to a radical change in conditions, especially in temperature, will often go through a period during which their flowering is erratic.

Despite this unpredictability, many growers have catasetums which, year after year, produce male flowers. In cases such as these, often the grower does not realize that his or her plants are producing flowers of only one sex, not two, and would be

surprised (if not doubtful) to learn that the plants are capable of producing an entirely different flower of another sex! Early collectors and classifiers of *Catasetum* species with unisexual flowers were likewise not aware of the two-sided nature of these species. As a result, the same species was frequently classified as two separate species: one based on the male flowers, the other on the female flowers. Imagine the surprise — and confusion — when a plant collected bearing female flowers produced quite a distinct set of male flowers in cultivation!



Photo: Greg Allikas
FIGURE 6 – *Catasetum pileatum*
'KG's El Supremo' AM/AOS (81pts)

Fortunately for the grower, the showier male flowers of catasetums are far more often produced by plants in cultivation than the less ostentatious female flowers. For example, comparatively few growers have seen the female flowers of *Catasetum pileatum*, surely the best known and most widely cultivated of catasetums. The female flowers of this species are characteristic of their gender and genus in virtually every aspect. The male flowers, on the other hand, are the largest and most spectacular of the genus.

Though variable in width, the sepals and petals of the male flowers of *Catasetum pileatum* are typical in form and arrangement. In length, these segments contribute to the large size of the flower. The natural spread, from tip to tip of the outstretched lateral sepals, often measures over 4 inches (10 cm). It is the huge, nearly circular lip, however, which sets the flowers apart. Finely serrated and cupped, this lip has a



FIGURE 7 – *Catasetum pileatum*
'Riopelle', CCM/AOS (85pts)



FIGURE 8 – *Catsetum expansum*
'Robert', AM/AOS (86pts)

central, sac-like depression (FIGURE 6).

The male flowers of *Catasetum pileatum* vary considerably in color from cultivar to cultivar. While the majority are white or off-white, some cultivars are yellow, particularly surrounding the entrance of the short spur (FIGURE 6). Others are green overall, and a very rare few have red pigment spotting or even covering the flowers (Couret, 1977).

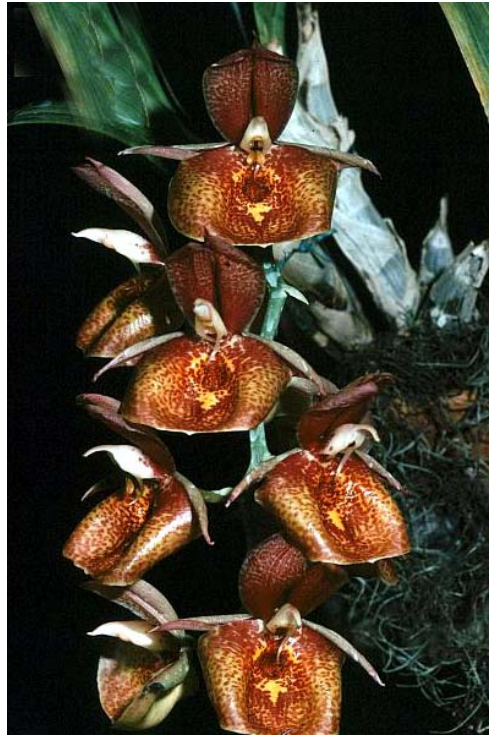
The inflorescences bearing male flowers of *Catasetum pileatum* can attain lengths in excess of 12 inches (30 cm). Vigorous pseudobulbs usually produce several inflorescences, each carrying over a dozen attractively spaced flowers. This tendency to be floriferous, combined with the showy nature of the individual flower, results in a spectacular display when healthy plants are in bloom (FIGURE 7).

Closely related to *Catasetum pileatum*, *Catasetum expansum* (syn. *platyglossum*) has very similar male flowers which range in color nearly as widely, from the red-spotted flowers illustrated in FIGURE 8, to the spotless, green flowers pictured on the back cover of last month's issue. With these as well as most *Catasetum* species, the longer the inflorescence bearing male flowers, and the more flowers it has to carry, the more pendent it becomes. Many growers stake these inflorescences well before the flowers fully develop, in large part to keep the flowers clear of the plant's container, thus avoiding possible damage. Likewise, the plant itself has to be raised to give the inflorescences proper clearance (FIGURES 3 and 8).

Catasetum Orchidglade, a cross of *Ctstm. expansum* and *Ctstm. pilealum* registered by Jones & Scully, Inc. in 1974, like its parent species, shows a tremendous range in



**FIGURE 9 – *Catasetum* Orchidglade
'Orchidglade II', AM/AOS (83pts)**



**FIGURE 10 – *Catasetum* Orchidglade
'York', HCC/AOS (75pts)**

coloration, from clones which produce spotless, white or yellow male flowers, to those having male flowers heavily spotted in red (Scully, 1975) (FIGURES 9 and 10). A few clones of *Catasetum* Orchidglade are solid red. This hybrid, like *Catasetum* Francis Nelson, is a vigorous grower, possibly easier to grow than the species involved in creating it.

Every male flower of *Catasetum* Orchidglade has a column with antennae-like projections poised over the lip, a trait characteristic of male flowers of this genus. These projections, when disturbed, eject the pollinarium. The pollinarium consists of two yellow pollinia, a sticky disc called the viscidium, and a narrow, connecting stipe (FIGURE 11). In this way, when an insect lands on the lip of a male flower and touches these projections, it is struck by the ejected pollinarium, which attaches firmly to its abdomen, to be carried, hopefully, to a female flower of the species for pollination (van der Fiji and Dodson, 1966).

Unsuspecting humans as well can be taken by surprise by this very effective pollination mechanism. Growers of *catasetums* with unisexual flowers can take great delight in asking someone uninformed about the peculiarities of these orchids to "Come, sniff the flowers!" The expression on the face of someone so foolish to fall for this trick is priceless — made all the more amusing by the pollinarium affixed to the nose! The single disadvantage to engaging in this form of plant-trickery is that, once the pollinarium is ejected, the flower fades (FIGURE 11). For this reason, *catasetums* bearing male flowers should be moved with a great deal of caution, as the pollinaria can be ejected by sudden movement as well.



Photo: Greg Allikas
**FIGURE 11 – *Catasetum fimbriatum* showing ejected
pollinarium, stipe and viscidium**

Whether or not the pollinarium is ejected, the flowers of *Catasetum* species are notoriously short-lived. Flowers of some species may be open only a matter of a few days before the sepal and petal tips begin to lose their substance and curl. The heavier, almost plastic substance typical of the lip of many *Catasetum* flowers may be the reason it is the last part of the flower to fade. Apart from any inherent tendencies, flower longevity in *Catasetum* is very dependent on temperature and humidity conditions. Flowers opening in the heat of mid-summer may last less than a week, while flowers produced by the same plants, opening in the cooler weather of late fall or early winter may last nearly two weeks. The combination of high temperature and low humidity is especially damaging, though low humidity alone can greatly reduce the life of a *Catasetum* flower.

A number of hybrids have been made between *Catasetum* species with perfect flowers (see the previous article for this series) and those with unisexual flowers discussed here. A cross between *Ctsm. roseum* and *Ctsm. pileatum*. *Catasetum* Delightful is one such intersectional (or intergeneric) hybrid, registered by J.W. Furrow in 1973. The awarded clone pictured in FIGURE 12 is a blending of the distinct traits of both these groups. Having a natural spread of 2½ inches (6.7 cm), these flowers are intermediate in size between the two species. The question remains, however, whether they are perfect or unisexual flowers!

The genus *Cycnoches* has much in common with *Catasetum*. Among other traits, its species also produce unisexual flowers. *Cycnoches* flowers, though, have a look and beauty all their own. Next month, we will examine "The Swan Orchids".



Photo: Curtis Gean
FIGURE 6 – *Catasetum* Delightful
'Anastasia', HCC/AOS (76pts)

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